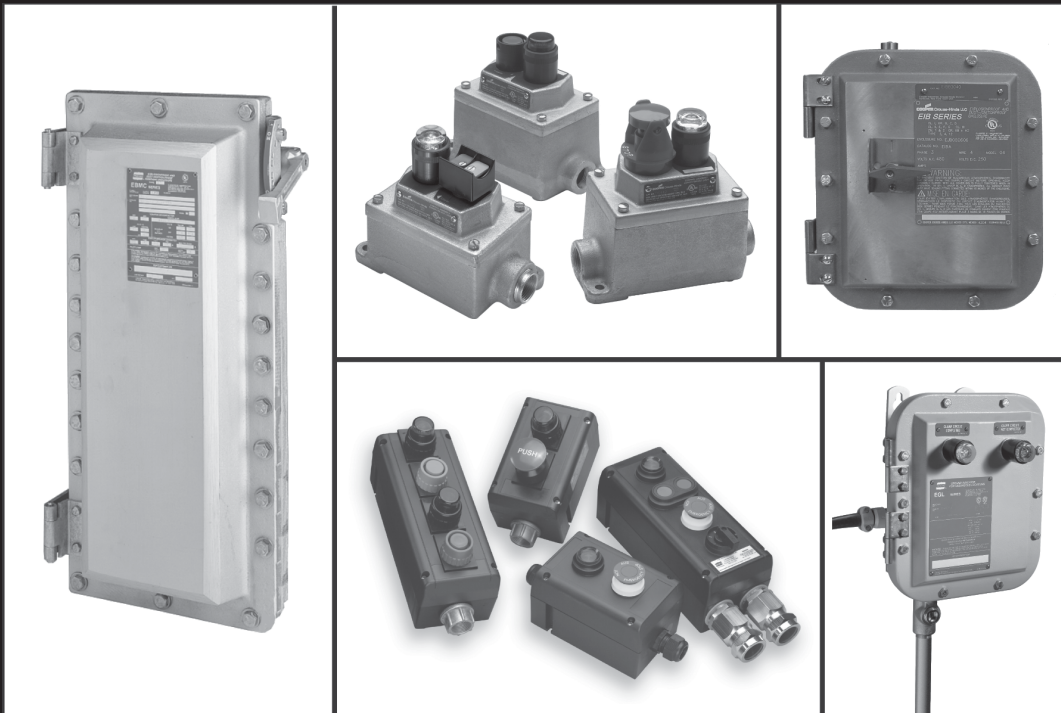


# ***Industrial Control & Circuit Breakers***

## ***Section C***

Innovative, intelligent NEC and IEC solutions safely and efficiently control power and protect circuits in explosive, wet, and corrosive environments worldwide.



### **New Products in the Control Product Line**

- EMN Series Pushbutton Style Compact Manual NEMA Starters
- EMN Series Pushbutton Style Compact Manual IEC Starters
- GUSC Enclosures with Manual Motor Starters
- XLC Explosionproof Lighting Contactors
- DSD-TS Series Timers
- ACE20 Series Explosionproof Variable Frequency Drives
- Engineered Solutions

### **Section**

2C  
2C  
2C  
5C  
5C  
6C  
7C

# C Industrial Control and Circuit Breakers

## Table of Contents

Section C of the Eaton's Crouse-Hinds Product Catalog lists motor control, circuit breakers, variable frequency drives, and engineered solutions and switch racks. Information on application, features, standard materials, standard finishes, size ranges, compliances, options, and accessories are presented for ease of product selection.

Information relating to product families in Section C is grouped as follows:

### Section 1C

#### Combination Motor Starters

(for hazardous and non-hazardous areas)

Combination magnetic line starters and enclosures for across-the-line motor starting, motor disconnect, motor and line protection, and start-stop operations.

For hazardous areas

EBMC  
EPC

For non-hazardous areas

NMC

### Section 2C

#### Motor Starters

(for hazardous and non-hazardous areas)

Line starters and enclosures for manual and magnetic across-the-line starting of motors, motor protection, and remote and manual starting and stopping.

Magnetic starters

EBMS  
EPC  
NMG

Manual starters

EFD GHG  
EDS NSSC  
EMN NFSC  
MC NMN  
EMN GUSC

### Section 3C

#### Circuit Breakers

(for hazardous and non-hazardous areas)

For use in conjunction with a variety of heating, lighting, and power circuits to provide disconnect means and short circuit protection.

For hazardous areas

EBMB  
EFD  
EPC  
EIB  
FLB

For non-hazardous areas

NCB

### Section 4C

#### Traditional Control Stations

(for hazardous and non-hazardous areas)

For means of remote and local motor control, visual indicators and circuit control and selection. Offers a selection of pushbuttons, pilot lights, and selector switches.

For hazardous areas

FlexStation GHG43  
EDS / EDSC N2SU / N2SCU  
EDSCM N2FA / N2FAC  
DSD / DSD-SR N2S / N2SC  
EDS  
EFS  
MC / MCC  
OAC

For non-hazardous areas

MC

### Section 5C

#### Specialty Control Stations

(for hazardous and non-hazardous areas)

For means of remote and local motor control, visual indicators and circuit control and selection. Offers a selection of push buttons, pilot lights, selector switches.

EJB Custom Control Panels

EMP / EMPS

EGL

AFU / AFUX

AFA / AFAX

D2X

EGF

XLC

DSD-TS

### Section 6C

#### Explosionproof Variable Frequency Drives

(for hazardous areas)

Highly flexible AC drives designed specifically for hazardous area locations. These drives can be mounted next to the motor in the classified area, providing significant installation cost savings - along with the traditional VFD benefits of energy savings, speed and torque control, and system diagnostics.

ACE

### Section 7C

#### Engineered Solutions

(for hazardous and non-hazardous areas)

For motor control centers in outdoor and/or hazardous areas.

For hazardous areas

ERK  
DRK

For non-hazardous areas

WRK

| Description                                                              | Page No.     |
|--------------------------------------------------------------------------|--------------|
| Application/Selection                                                    | see page 446 |
| Combination Line Starters and Enclosures                                 |              |
| Single speed, non-reversing, with circuit breakers & disconnect switches |              |
| EBMC Series                                                              | see page 447 |
| EPC Series                                                               | see page 454 |
| NMC Nonmetallic Series                                                   | see page 458 |
| Single speed, non-reversing, with motor circuit protectors               |              |
| EBMC Series                                                              | see page 453 |
| EPC Series                                                               | see page 457 |



# 1C Combination Motor Starters

## Application and Quick Selector Chart

### Applications:

Combination line starters are housed in enclosures suitable for specific environments, and are used for:

- Across-the-line starting of polyphase AC induction motors
- Providing disconnect means
- Branch circuit protection
- Motor running protection
- Remote starting and stopping

### Considerations for Selection:

Considerations for selection of proper enclosure:

- The environment of the enclosure location in accordance with NEC/CEC and NEMA/EEMAC requirements
- The characteristics of the starter and breaker to be enclosed
- See "Quick-Selector" below for guidance

### Materials and Finishes:

- Standard material on EBMC and EPC Series is copper-free aluminum with natural finish
- EBMC and EPC optional finish is *Corro-free*™ epoxy for use in exceptionally corrosive atmospheres
- Standard material on NMC Series is Krydon® high impact fiberglass-reinforced polyester, providing excellent corrosion resistance and stability to heat

### Options and Accessories:

Some of the options and accessories available for particular applications are:

- Push buttons
- Selector switches
- Control transformers
- Extra overload relays
- Extra interlock contacts
- Neutral connectors (both insulated and grounded)
- Breathers and drains

See individual listings for specific options. Many are available in kit form for field addition to existing units.

### Quick Selector Chart

| Enclosures for Combination Motor Starters |                                                                                                               |                           |                     |                                                    |                                   |                              |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------------------------------------------------|-----------------------------------|------------------------------|
| Enclosures                                | NEC/CEC – Hazardous Area Certifications and Compliance                                                        | NEMA/EEMAC Enclosure Type | NEMA/EEMAC Starters | Manufacturers Equipment Enclosed                   |                                   |                              |
|                                           |                                                                                                               |                           |                     | Starter                                            | Breaker/Switch                    | Cover Type                   |
| EBMC                                      | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 4*, 7BCD, 9EFG, 12     | 0 – 5               | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer | G.E.<br>Square D<br>Cutler-Hammer | Bolted/Ground Joint/Gasketed |
| EPC                                       | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III    | 3, 4, 7CD, 9EFG, 12       | 0 – 3               | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer | G.E.<br>Square D<br>Cutler-Hammer | Threaded                     |
| NMC                                       | —                                                                                                             | 3, 4X, 12                 | 0 – 4               | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer | G.E.<br>Square D<br>Cutler-Hammer | Gasketed                     |

\*Without EMP control devices



# EBMC Combination Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

1C

## Applications:

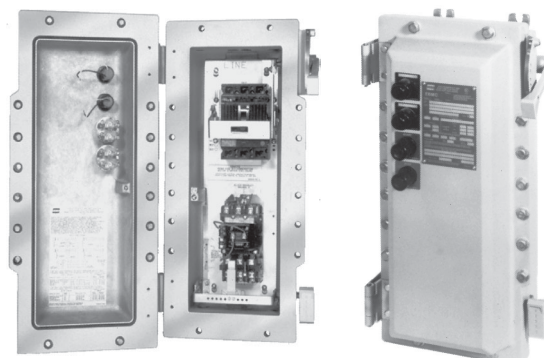
Spectrum™ EBM hinged cover motor control enclosures are used:

- For general motor control and circuit protection – indoors and outdoors – in damp, wet, dirty, dusty hazardous locations without the need for a protective shelter
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent
- For across-the-line starting, stopping, speed changing and reversing of polyphase AC induction motors
- To provide line disconnect means and short circuit protection
- To provide motor overload and undervoltage protection
- For service entrance, feeder or branch circuit protection for lighting, heating, appliance and motor circuits
- On switchracks or other assemblies where it's desired that motor control be centrally located

## Features:

- Rugged, corrosion resistant, cast copper-free aluminum construction (less than 0.4 of 1%)
- Component operating handles located through the right side wall of the body permits visual confirmation of correct component assembly and operation
- Total compliance to the wiring end room requirements of the National Electrical Code\*/Canadian Electrical Code
- Semi-clamshell enclosure design, with an external flanged ground joint between body and cover makes interior components more accessible
- Minimum enclosure-to-enclosure spacing with little interference between the opened cover and an adjacent enclosure
- Stainless steel hinges allow the cover to swing well out of the way
- Stainless steel, quick release, captive, hex head cover bolts. Stainless steel springs provide clear indication cover bolts are fully retracted from body
- Versatile, internal operating mechanisms allow for field adjustment to accommodate popular manufacturers' starters and breakers
- Simple, straightforward installation of breaker and starter on pre-drilled mounting plate within enclosure. Mounting plate also field removable.
- Circuit breaker motor circuit protector external operating handle can be padlocked in either "ON" or "OFF" positions
- Neoprene cover gasket permanently attached to the cover seals out moisture
- Bodies have top and bottom drilled and tapped entrances for power conduits plus one at the bottom for control conduit. Removable reducers are supplied, as standard, to accommodate smaller size conduits. All conduit entrances are plugged.
- Tap-on mounting feet
- Optional EMPS control devices may be added to enclosure cover
- Steel bracket for lifting larger enclosures during installation supplied as standard

\*National Electrical Code is a Registered Trademark of the National Fire Protection Association.



Interior components are readily accessible with ample end room for wiring

Side operators leave cover free for control options

## Certifications and Compliances:

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- UL Standards UL1203 – Hazardous (classified) locations
- UL Subject 2062 - High AIC rating (Interrupting Capacity) For Groups C & D only

| Volt | RMS Symm-Amperes |
|------|------------------|
| 240  | 65,000           |
| 480  | 50,000           |
| 600  | 25,000           |

- CSA Standard: C22.2 No. 30
- NEMA/EEMAC: 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shafts and bushings – stainless steel
- Cover bolts, hinges, washer and retractile springs – stainless steel
- Interior parts – sheet steel, electrogalvanized

## Electrical Rating Range:

- Motor starters – NEMA/EEMAC sizes 0-5
- Circuit breakers – 100, 150, 225, 250, 400, 600, 800, 1000† ampere frame sizes
- Motor circuit protectors – 150, 250, 400 ampere frame sizes

† 1000 Ampere Frame (max. 800 ampere trip)

Cl. I, Div. 1 &amp; 2, Groups B, C, D

Cl. II, Div. 1, Groups E, F, G

Cl. II, Div. 2, Groups F, G

Cl. III

NEMA 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

Explosionproof

Dust-Ignitionproof

Raintight

Wet Locations

Watertight

## Options:

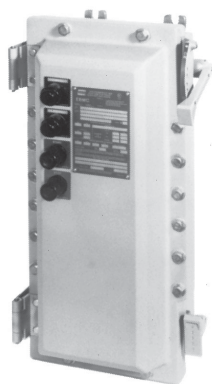
The following options are available from the factory by adding suffix to catalog number – suffixes are added alphanumerically.

### Catalog Number System Example

EBMC1FB-①-DT30FAL36-W643-②

① Options in this position are additions to the enclosure itself and should be listed alphanumerically.

② Options in this position are modifications to the starter and/or circuit breaker and should be listed alphanumerically.



**EBMC Series motor control enclosures with combination line starters.**

When specifying any one of the following options with Spectrum™ EBM Motor Controls (J1, J3, PB23, RR2, RR3) it is necessary to order DSL Legend Plates for identification and marking of the device(s) being used.

### Description

**Position  
in Cat. #**

**Suffix**

|                                                                                                                                                                                               |   |                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------|
| • Ambient compensated circuit breaker trip setting .....                                                                                                                                      | ② | <b>AC</b>                            |
| • Less overload relays (lighting contactor).....                                                                                                                                              | ① | <b>CL</b>                            |
| • Less overload relays (motor contactor).....                                                                                                                                                 | ① | <b>CM</b>                            |
| • Control Circuit Transformer, 100VA for NEMA/EEMAC sizes 0-2, 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not provided) ..... | ① | <b>FTPS100</b>                       |
| • Control Circuit Transformer, 200VA for NEMA/EEMAC size 3, 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not provided) .....    | ① | <b>FTPS200</b>                       |
| • Control Circuit Transformer, 300VA for NEMA/EEMAC size 4, 5 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not provided) .....  | ① | <b>FTPS300</b>                       |
| • Pilot light, 120VAC, red jewel, w/blank indicating plate .....                                                                                                                              | ① | <b>J1</b>                            |
| • Pilot light, 120VAC, green jewel, w/blank indicating plate .....                                                                                                                            | ① | <b>J3</b>                            |
| • LED pilot lights (in place of standard incandescent lamps) .....                                                                                                                            | ① | <b>LED</b>                           |
| • Less heaters in starter overload relay.....                                                                                                                                                 | ② | <b>0</b>                             |
| • Start-Stop pushbuttons (requires 2 spaces).....                                                                                                                                             | ① | <b>PB23<math>\frac{1}{2}</math></b>  |
| • On-Off selector switch .....                                                                                                                                                                | ① | <b>RR2<math>\frac{1}{2}</math></b>   |
| • Hand-Off-Auto selector switch .....                                                                                                                                                         | ① | <b>RR3<math>\frac{1}{2}</math></b>   |
| • Space heater, 120 Volt, 25 Watts .....                                                                                                                                                      | ① | <b>R11</b>                           |
| • Space heater, 240 Volt, 25 Watts .....                                                                                                                                                      | ① | <b>R22</b>                           |
| • Space heater, 480 Volt, 25 Watts .....                                                                                                                                                      | ① | <b>R44</b>                           |
| • Automatic reset overload relay .....                                                                                                                                                        | ① | <b>S1</b>                            |
| • Insulated neutral w/2 connectors .....                                                                                                                                                      | ① | <b>S146</b>                          |
| • Std. drain, Class I, B,C & D; Class II, E, F & G; Class III .....                                                                                                                           | ① | <b>S756<math>\frac{1}{2}</math></b>  |
| • Std. breather & drain, Class I, B,C & D; Class II, E, F & G; Class III .....                                                                                                                | ① | <b>S756V<math>\frac{1}{2}</math></b> |
| • External epoxy finish .....                                                                                                                                                                 | ① | <b>S752</b>                          |
| • Internal and external epoxy finish .....                                                                                                                                                    | ① | <b>S753</b>                          |
| • Additional control contacts, N.O. or N.C. – for single speed, non-reversing starters only (number limited by design of starter. Details on specific makes and sizes on request.)            |   |                                      |
| Auxiliary contacts on starter 1 N.O. & 1 N.C.....                                                                                                                                             | ② | <b>S781</b>                          |
| Auxiliary contacts on starter 2 N.O. & 2 N.C.....                                                                                                                                             | ② | <b>S782</b>                          |
| Auxiliary contacts on starter 3 N.O. & 3 N.C.....                                                                                                                                             | ② | <b>S783</b>                          |
| • Auxiliary switch on Circuit Breaker 1A and 1B contacts .....                                                                                                                                | ② | <b>S784</b>                          |
| • Auxiliary switch on Circuit Breaker 2A and 2B contacts .....                                                                                                                                | ② | <b>S785</b>                          |
| • 12 Point term. block – 30 Amp, 300V.....                                                                                                                                                    | ① | <b>S786</b>                          |
| • General purpose control relay, 4 pole N.O., contacts rated 10A@600V, coil 120VAC, 50 / 60 hertz .....                                                                                       | ① | <b>S787*</b>                         |

\*Use of this option with NEMA/EEMAC Size 0, or 1 starters necessitates using the larger "D" size enclosure.

$\frac{1}{2}$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators. Breather and drain entries must be plugged for NEMA 4 rating.

$\frac{1}{2}$ With S752 or S753.

# EBMC Combination Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\ddagger\ddagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

1C

## Options:

- If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below.
- Insert Legend Plate(s) Catalog Number (i.e. DSL16) immediately after optional device in the EBM Catalog Number.
- If EMP devices are to be added in the field, DSL Legend Plates must be ordered separately as they are not furnished with the EMP/EMPS devices.

## Example:

EBMC1FB-J1-DSL14-J3-DSL09-DT30FAL36-W643

Use the charts below to select the appropriate legend plate(s) for your application. Markings shown in **bold print** are etched; all others are stamped.

## Single Function Legend Plates

| Marking                 | Cat. # |
|-------------------------|--------|
| Automatic               | DSL16  |
| Blank                   | DSL01  |
| Blank with single field | DSL02  |
| <b>Close</b>            | DSL21  |
| <b>Down</b>             | DSL23  |
| <b>Emerg. Stop</b>      | DSL17  |
| Fast                    | DSL46  |
| Forward                 | DSL18  |
| Hand                    | DSL15  |
| In                      | DSL24  |
| Jog                     | DSL10  |
| Lower                   | DSL27  |
| <b>On</b>               | DSL07  |
| <b>Off</b>              | DSL08  |
| <b>Open</b>             | DSL20  |
| <b>Out</b>              | DSL25  |
| <b>Power On</b>         | DSL14  |
| Raise                   | DSL26  |
| Reset                   | DSL12  |
| Reverse                 | DSL19  |
| Run                     | DSL09  |
| <b>Safe</b>             | DSL85  |
| Slow                    | DSL47  |
| <b>Start</b>            | DSL05  |
| <b>Stop</b>             | DSL06  |
| <b>Test</b>             | DSL13  |
| Trip                    | DSL11  |
| <b>Up</b>               | DSL22  |

## Two Function Legend Plates

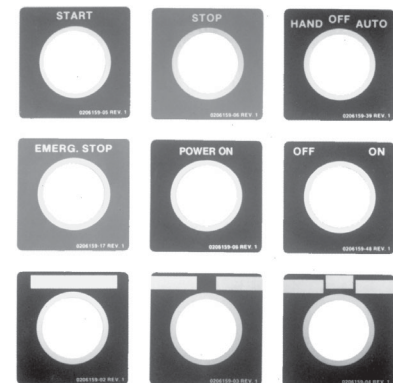
| Marking             | Cat. # |
|---------------------|--------|
| Blank with 2 fields | DSL03  |
| <b>For-Rev</b>      | DSL30  |
| Hand-Auto           | DSL29  |
| In-Out              | DSL35  |
| <b>Off-On</b>       | DSL48  |
| <b>Open-Close</b>   | DSL32  |
| Raise-Lower         | DSL36  |
| <b>Run-Jog</b>      | DSL28  |
| Safe-Run            | DSL86  |
| Start-Stop          | DSL37  |
| Slow-Fast           | DSL65  |
| <b>Up-Down</b>      | DSL33  |

## Three Function Legend Plates

| Marking               | Cat. # |
|-----------------------|--------|
| Auto-Off-Hand         | DSL49  |
| Blank with 3 fields   | DSL04  |
| Fast-Off-Slow         | DSL41  |
| <b>For-Off-Rev</b>    | DSL40  |
| <b>Hand-Off-Auto</b>  | DSL39  |
| <b>Run-Off-Jog</b>    | DSL38  |
| <b>Open-Off-Close</b> | DSL43  |
| Raise-Off-Lower       | DSL87  |
| Slow-Off-Fast         | DSL88  |
| Up-Off-Down           | DSL44  |
| 1-Off-2               | DSL42  |

Background color for all legend plates is black with the following exceptions:

| Marking     | Plate Color |
|-------------|-------------|
| Start       | Green       |
| Stop        | Red         |
| Emerg. Stop | Red         |



$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.  
 $\ddagger\ddagger$ With S752 or S753.

# 1C

## EBMC Combination Line Starters and Enclosures

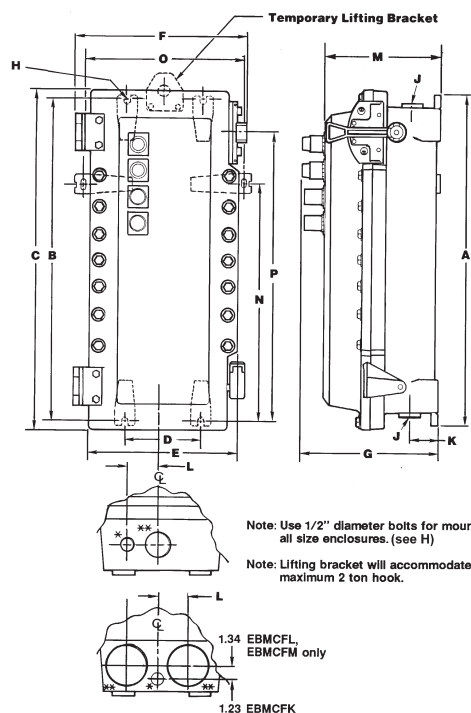
Dimensions (In inches)†

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4†, 4X††, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### Dimensions

In Inches:



\*1" Conduit entrance for control conductors (top & bottom).

\*\*Conduit entrance for power conductors (top & bottom). (All conduit entrances supplied with RE reducer and PLG plug.)

| Enclosure Only Cat. #                           | Enclosure Size Symbol | A     | B     | C     | D     | E     | F     | G     | J** Conduit Entry Trade Size D&TØ | w/RE     | K    | L    | M     | N     | O     | P     |
|-------------------------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-----------------------------------|----------|------|------|-------|-------|-------|-------|
| <b>Size 0, 1 FVNR combination line starter§</b> |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFB                                          | B                     | 25.75 | 24.75 | 26.90 | 6.00  | 13.03 | 14.78 | 12.13 | 2"                                | 1.5"     | 3.25 | 3.13 | 10.25 | —     | —     | 22.00 |
| <b>Size 2 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFD                                          | D                     | 28.25 | 27.25 | 29.40 | 6.00  | 13.03 | 14.67 | 12.13 | 3"                                | 2.5"     | 3.25 | 3.13 | 10.25 | —     | —     | 24.50 |
| <b>Size 3 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFG■                                         | G                     | 38.13 | 36.50 | 39.28 | 6.00  | 13.03 | 14.78 | 12.13 | 3"                                | 2.5"     | 3.25 | 3.13 | 10.25 | —     | —     | 34.06 |
| EBMCFH                                          | H                     | 37.50 | 36.50 | 38.65 | 6.00  | 14.65 | 16.65 | 13.54 | 3"                                | 2.5"     | 3.25 | 3.94 | 11.66 | —     | —     | 33.75 |
| <b>Size 4 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFK■                                         | K                     | 43.12 | 41.50 | 42.65 | 12.00 | 17.65 | 20.46 | 12.80 | (2) 3"                            | (2) 2.5" | 3.25 | 3.00 | 10.78 | —     | —     | 19.97 |
| EBMCFL                                          | L                     | 53.47 | 51.50 | 53.28 | 12.00 | 17.90 | 20.58 | 15.00 | (2) 4"                            | (2) 3.5" | 4.00 | 3.50 | 13.03 | 41.50 | 18.40 | 29.88 |
| <b>Size 5 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFM                                          | M                     | 64.22 | 62.50 | 64.03 | 12.00 | 17.90 | 21.08 | 15.00 | (2) 4"                            | (2) 3.5" | 4.00 | 3.50 | 13.03 | 41.50 | 18.40 | 34.46 |

†Dimensions are approximate, not for construction purposes.

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§Use EBMCFD enclosure when LVR1 or S787 options are ordered with Size 0 or 1 combination starters.

■For Cutler-Hammer W200 Advantage® starters.

⊙Drilled & Tapped.

# EBMC Combination Line Starters and Enclosures

## Single-Speed Non-Reversing with Circuit Breakers 3-Pole 60 hertz, 600VAC Maximum

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\pm$ , 4X $\pm$ ,  
7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**1C**

### Ordering Information:

To order an enclosure complete with starter and breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown in the footnotes see page 452.

Select the complete Cat. No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Enclosures only can be ordered. Select from listings below.

Instantaneous magnetic trip circuit breakers (magnetic circuit interrupters) can be supplied. Consult factory.

For Combination starters with motor circuit protectors for single speed, non-reversing motors see page 453.

| Motor Starter     |            |           | Circuit Breaker |             |             | Enclosure                        |                                 |
|-------------------|------------|-----------|-----------------|-------------|-------------|----------------------------------|---------------------------------|
| Max. HP Polyphase | Line Volts | NEMA Size | Amp Rating      | Frame Volts | Frame Types | Without Breaker & Starter Cat. # | With Breaker & Starter Cat. # § |
| 2                 | 120        | 0         | 30              | 240         | TEB         | EBMCFB                           | EBMC0FB ①30②32 ③613             |
| 2                 | 120        | 0         | 30              | 480         | TED, EHD    | EBMCFB                           | EBMC0FB ①30②34 ③613             |
| 2                 | 120        | 0         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①30②36 ③613             |
| 3                 | 240        | 0         | 20              | 240         | TEB         | EBMCFB                           | EBMC0FB ①20②32 ③623             |
| 3                 | 240        | 0         | 20              | 480         | TED, EHD    | EBMCFB                           | EBMC0FB ①20②34 ③623             |
| 3                 | 240        | 0         | 20              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①20②36 ③623             |
| 5                 | 480        | 0         | 15              | 480         | TED, EHD    | EBMCFB                           | EBMC0FB ①15②34 ③643             |
| 5                 | 480        | 0         | 15              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①15②36 ③643             |
| 5                 | 600        | 0         | 15              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①15②36 ③663             |
| 5                 | 240        | 1         | 30              | 240         | TEB         | EBMCFB                           | EBMC1FB ①30②32 ③623             |
| 5                 | 240        | 1         | 30              | 480         | TED, EHD    | EBMCFB                           | EBMC1FB ①30②34 ③623             |
| 5                 | 240        | 1         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①30②36 ③623             |
| 7½                | 240        | 1         | 50              | 240         | TEB         | EBMCFB                           | EBMC1FB ①50②32 ③623             |
| 7½                | 240        | 1         | 50              | 480         | TED, EHD    | EBMCFB                           | EBMC1FB ①50②34 ③623             |
| 7½                | 240        | 1         | 50              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①50②36 ③623             |
| 10                | 480        | 1         | 30              | 480         | TED, EHD    | EBMCFB                           | EBMC1FB ①30②34 ③643             |
| 10                | 480        | 1         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①30②36 ③643             |
| 10                | 600        | 1         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①30②36 ③663             |
| 10                | 240        | 2         | 50              | 240         | TEB         | EBMCFD                           | EBMC2FD ①50②32 ③623             |
| 10                | 240        | 2         | 50              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①50②34 ③623             |
| 10                | 240        | 2         | 50              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①50②36 ③623             |
| 15                | 240        | 2         | 70              | 240         | TEB         | EBMCFD                           | EBMC2FD ①70②32 ③623             |
| 15                | 240        | 2         | 70              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①70②34 ③623             |
| 15                | 240        | 2         | 70              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①70②36 ③623             |
| 15                | 480        | 2         | 40              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①40②34 ③643             |
| 15                | 480        | 2         | 40              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①40②36 ③643             |
| 15                | 600        | 2         | 40              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①40②36 ③663             |
| 20                | 480        | 2         | 50              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①50②34 ③643             |
| 20                | 480        | 2         | 50              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①50②36 ③643             |
| 20                | 600        | 2         | 50              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①50②36 ③663             |
| 25                | 480        | 2         | 70              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①70②34 ③643             |
| 25                | 480        | 2         | 70              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①70②36 ③643             |
| 25                | 600        | 2         | 70              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①70②36 ③663             |
| 20                | 240        | 3         | 90              | 240         | TEB         | EBMCFH                           | EBMC3FH ①90②32 ③623             |
| 25                | 240        | 3         | 100             | 240         | TEB         | EBMCFH                           | EBMC3FH ①100②32 ③623            |
| 30                | 240        | 3         | 125             | 480         | TED         | EBMCFH                           | EBMC3FH ①125②34 ③623            |
| 30                | 480        | 3         | 70              | 480         | TED, EHD    | EBMCFH                           | EBMC3FH ①70②34 ③643             |
| 30                | 480        | 3         | 70              | 600         | TED, FDB    | EBMCFH                           | EBMC3FH ①70②36 ③643             |
| 30                | 600        | 3         | 70              | 600         | TED, FDB    | EBMCFH                           | EBMC3FH ①70②36 ③663             |

①②③ See page 452 for configurable options.

To include a 120V coil, insert a "1" between second to last and last character in catalog number. 120V coil standard with FTFS option.  
Ex. EBMCFB-①30②32-③613 becomes EBMCFB-①30②32-③6113

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§Starters are furnished with 3 heaters, when heater ratings are fully specified.

**Crouse-Hinds**

by **E•T•N**

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# 1C EBMC Combination Line Starters and Enclosures

## Single-Speed Non-Reversing with Circuit Breakers and Fusible Disconnect Switches

### 3-Pole 60 hertz, 600VAC Maximum

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 3R, 4 $\pm$ , 4X $\pm$ , 7BCD,  
 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

| Motor Starter     |            |           | Circuit Breaker |             |                    | Enclosure                        |                                 |
|-------------------|------------|-----------|-----------------|-------------|--------------------|----------------------------------|---------------------------------|
| Max. HP Polyphase | Line Volts | NEMA Size | Amp Rating      | Frame Volts | Frame Types        | Without Breaker & Starter Cat. # | With Breaker & Starter Cat. # § |
| 40                | 480        | 3         | 90              | 480         | TED, EHD           | EBMCFH                           | EBMC3FH ①90②34 ③643             |
| 40                | 480        | 3         | 90              | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①90②36 ③643             |
| 40                | 600        | 3         | 90              | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①90②36 ③663             |
| 50                | 480        | 3         | 100             | 480         | TED, EHD           | EBMCFH                           | EBMC3FH ①100②34 ③643            |
| 50                | 480        | 3         | 100             | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①100②36 ③643            |
| 50                | 600        | 3         | 100             | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①100②36 ③663            |
| 40                | 240        | 4         | 175             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①175②36 ③623            |
| 50                | 240        | 4         | 200             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①200②36 ③623            |
| 60                | 480        | 4         | 125             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①125②36 ③643            |
| 60                | 600        | 4         | 100             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①100②36 ③663            |
| 75                | 480        | 4         | 150             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①150②36 ③643            |
| 75                | 600        | 4         | 125             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①125②36 ③663            |
| 100               | 480        | 4         | 200             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①200②36 ③643            |
| 100               | 600        | 4         | 150             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①150②36 ③663            |
| 125               | 480        | 5         | 300             | 600         | TJK / KD, TJJ, KDB | EBMCFM                           | EBMC5FM ①300②36 ③643            |
| 150               | 480        | 5         | 400             | 600         | TJK / KD, TJJ, KDB | EBMCFM                           | EBMC5FM ①400②36 ③643            |

| Motor Starter     |                 |           | Fusible Disconnect Switch |            |             |                                         |
|-------------------|-----------------|-----------|---------------------------|------------|-------------|-----------------------------------------|
| Max. HP Polyphase | Max. Line Volts | NEMA Size | Amp Rating                | Max. Volts | Switch Type | With Disconnect Switch & Starter Cat. # |
| 5                 | 600             | 0         | 30                        | 600        | DS161R      | EBMC0FD WFD30J36 W643                   |
| 10                | 600             | 1         | 30                        | 600        | DS161R      | EBMC1FD WFD30J36 W643                   |
| 25                | 600             | 2         | 60                        | 600        | DS262R      | EBMC2FD WFD60J36 W643                   |
| 30                | 600             | 3         | 100                       | 600        | DS363R      | EBMC3FH WFD100J36 W643                  |

①Circuit Breakers:

| Manufacturer     | Symbol |
|------------------|--------|
| Cutler-Hammer    | WT     |
| General Electric | TT     |

NEMA

| Size | Without Switch & Starter Cat. # |
|------|---------------------------------|
| 0    | EBMCFD FD                       |
| 1    | EBMCFD FD                       |
| 2    | EBMCFD FD                       |
| 3    | EBMCFH FD                       |

②Select Circuit Breaker Frame Type based on Frame Size, Voltage, and Manufacturer desired:

| Manufacturer     | 100 Amp. Frame and 150 Amp. Frame 240V 480V 600V AC |     |     | 225 Amp. Frame and 250 Amp. Frame 600VAC                               |  | 400 Amp. Frame 600VAC                                                  |  |
|------------------|-----------------------------------------------------|-----|-----|------------------------------------------------------------------------|--|------------------------------------------------------------------------|--|
|                  | AC                                                  | AC  | AC  |                                                                        |  |                                                                        |  |
| Cutler-Hammer    | —                                                   | EHD | FDB | JD – Interchangeable Trip Unit<br>JDB – Non-Interchangeable Trip Unit  |  | KD – Interchangeable Trip Unit<br>KDB – Non-Interchangeable Trip Unit  |  |
| General Electric | TEB                                                 | TED | TED | TFK – Interchangeable Trip Unit<br>TFJ – Non-Interchangeable Trip Unit |  | TJK – Interchangeable Trip Unit<br>TJJ – Non-Interchangeable Trip Unit |  |

③Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§Starters are furnished with 3 heaters, when heater ratings are fully specified.

**Crouse-Hinds**  
 by **E.T.N**



# EBMC Combination Line Starters

**Single-Speed Non-Reversing  
with Motor Circuit Protectors  
3-Pole 60 hertz, 600VAC Maximum**

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4†, 4X††,  
7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**1C**

## Ordering Information:

Select the complete Catalog No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motors or specify ampere rating of heaters.

### Motor Starter

| Max. HP<br>Polyphase | Volts | NEMA<br>Size | MCP<br>Amp<br>Rating | Enclosure<br>without Starter<br>& MCP Cat. # | Enclosure<br>with Starter<br>& MCP Cat. # § |
|----------------------|-------|--------------|----------------------|----------------------------------------------|---------------------------------------------|
| 3                    | 240   | 0            | 15                   | EBMCFB                                       | EBMC0FB ①15A②36 ③623                        |
| 3                    | 480   | 0            | 7                    | EBMCFB                                       | EBMC0FB ①7A②36 ③643                         |
| 3                    | 600   | 0            | 7                    | EBMCFB                                       | EBMC0FB ①7A②36 ③663                         |
| 5                    | 480   | 0            | 15                   | EBMCFB                                       | EBMC0FB ①15A②36 ③643                        |
| 5                    | 600   | 0            | 15                   | EBMCFB                                       | EBMC0FB ①15A②36 ③663                        |
| 7½                   | 240   | 1            | 30                   | EBMCFB                                       | EBMC1FB ①30A②36 ③623                        |
| 7½                   | 480   | 1            | 15                   | EBMCFB                                       | EBMC1FB ①15A②36 ③643                        |
| 10                   | 480   | 1            | 30                   | EBMCFB                                       | EBMC1FB ①30A②36 ③643                        |
| 10                   | 600   | 1            | 15                   | EBMCFB                                       | EBMC1FB ①15A②36 ③663                        |
| 10                   | 240   | 2            | 50                   | EBMCFD                                       | EBMC2FD ①50A②36 ③623                        |
| 15                   | 240   | 2            | 100                  | EBMCFD                                       | EBMC2FD ①100A②36 ③623                       |
| 15                   | 480   | 2            | 30                   | EBMCFD                                       | EBMC2FD ①30A②36 ③643                        |
| 20                   | 600   | 2            | 30                   | EBMCFD                                       | EBMC2FD ①30A②36 ③663                        |
| 25                   | 480   | 2            | 50                   | EBMCFD                                       | EBMC2FD ①50A②36 ③643                        |
| 25                   | 600   | 2            | 50                   | EBMCFD                                       | EBMC2FD ①50A②36 ③663                        |
| 30                   | 240   | 3            | 100                  | EBMCFH                                       | EBMC3FH ①100A②36 ③623                       |
| 30                   | 600   | 3            | 50                   | EBMCFH                                       | EBMC3FH ①50A②36 ③663                        |
| 50                   | 480   | 3            | 100                  | EBMCFH                                       | EBMC3FH ①100A②36 ③643                       |
| 50                   | 600   | 3            | 100                  | EBMCFH                                       | EBMC3FH ①100A②36 ③663                       |
| 50                   | 240   | 4            | 250*                 | EBMCFL                                       | EBMC4FL ①250④236 ③623                       |
| 100                  | 480   | 4            | 250*                 | EBMCFL                                       | EBMC4FL ①250④236 ③643                       |
| 100                  | 600   | 4            | 250*                 | EBMCFL                                       | EBMC4FL ①250④236 ③663                       |
| 60                   | 240   | 5            | 250*                 | EBMCFM                                       | EBMC5FM ①250④236 ③623                       |
| 100                  | 240   | 5            | 400                  | EBMCFM                                       | EBMC5FM ①400④236 ③623                       |
| 125                  | 480   | 5            | 250*                 | EBMCFM                                       | EBMC5FM ①250④236 ③643                       |
| 150                  | 600   | 5            | 250*                 | EBMCFM                                       | EBMC5FM ①250④236 ③663                       |
| 200                  | 480   | 5            | 400                  | EBMCFM                                       | EBMC5FM ①400④236 ③643                       |
| 200                  | 600   | 5            | 400                  | EBMCFM                                       | EBMC5FM ①400④236 ③663                       |

### ①Motor Circuit Protectors:

| Manufacturer     | Symbol |
|------------------|--------|
| Cutler-Hammer    | WP     |
| General Electric | TP     |
| Square D         | DP     |

②Select Motor Circuit Protector Frame Type based on Frame Size and Manufacturer desired:

|                  | 150 Amp.<br>Frame | 250 Amp.<br>Frame | 400 Amp.<br>Frame |
|------------------|-------------------|-------------------|-------------------|
| Cutler-Hammer    | HMCP<br>(F-Frame) | HMCP<br>(J-Frame) | HMCP<br>(K-Frame) |
| General Electric | TEC               | TFC               | TJC               |
| Square D         | FAL               | KAL               | LAL               |

### ③Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

‡ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

\*General Electric motor circuit protectors are 225 Amp. Rated.

§Starters are furnished with three heaters when heater ratings are fully specified.

④After the MCP amp rating the following character symbol must be entered to designate the trip range. Consult factory for other trip ranges available.

| MCP Amp Rating               | Symbol | Trip Range   |
|------------------------------|--------|--------------|
| <b>Cutler-Hammer (WP)</b>    |        |              |
| 7                            | A      | 21 to 70     |
| 15                           | A      | 45 to 150    |
| 30                           | A      | 90 to 300    |
| 50                           | B      | 150 to 500   |
| 100                          | B      | 300 to 1000  |
| 250                          | J      | 1250 to 2500 |
| 400                          | G      | 1250 to 2500 |
| <b>General Electric (TP)</b> |        |              |
| 7                            | A      | 18 to 90     |
| 15                           | A      | 42 to 198    |
| 30                           | A      | 90 to 390    |
| 50                           | A      | 180 to 660   |
| 100                          | A      | 300 to 1308  |
| 225                          | B      | 1000 to 2250 |
| 400                          | C      | 1000 to 3300 |
| <b>Square D (DP)</b>         |        |              |
| 7                            | A      | 18 to 70     |
| 15                           | A      | 50 to 180    |
| 30                           | A      | 100 to 350   |
| 50                           | A      | 150 to 580   |
| 100                          | A      | 300 to 1100  |
| 250                          | H      | 1250 to 2500 |
| 400                          | E      | 1250 to 2500 |

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by **E.T.N**

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## Applications:

EPC combination line starters and enclosures are used:

- For across-the-line starting of polyphase AC induction motors
- In locations which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- In damp, wet or corrosive locations
- For installation indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnecting means, motor branch circuit protection, motor running protection, undervoltage protection and remote starting and stopping due to the combination of thermal-magnetic circuit breaker and magnetic motor starter

## Features:

- Quick-opening covers – less than two turns to remove or install
- Three section design for ease of installation
- Water-shedding construction with female threads on top cover, male threads on bottom cover, and top cover skirted
- Specially located stops and locks insure adequate thread engagement and prevent overtightening
- Separate replaceable mounting bracket attached to the rear of the body provides three-point suspension for quick installation and leveling – one keyhole slot at top and two open slots at bottom
- Bodies have two taper-tapped conduit hubs with integral bushings on the top, and two more directly below
- Universal mounting plate and reset mechanism will accommodate any of the motor starters and circuit breakers in catalog listing
- When interior mounting plate is removed, feeder and branch circuit conductors are easily pulled into the wiring chamber. The interior assembly, with breaker and starter attached, is then replaced, final connections made, and covers assembled
- External handle, which operates breaker can be padlocked in either "ON" or "OFF" positions
- Breaker is trip-free of the handle, therefore it will open under short circuit or overload, even if the external handle is locked in the "ON" position
- Furnished with third overload relay as standard

## Certifications and Compliances:

- NEC/CEC  
Class I, Division 1 & 2, Groups C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA/EEMAC: 3, 4, 7CD, 9EFG, 12
- UL Standard: 698
- CSA Standards: C22.2 No. 30

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized with chromate finish

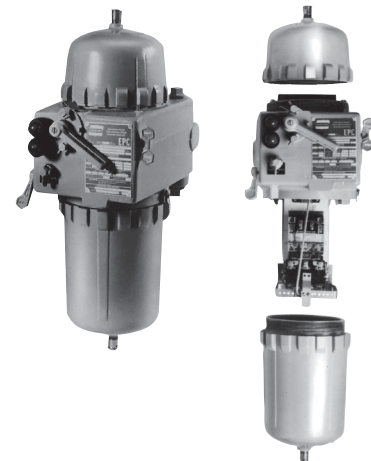
## Electrical Rating Range:

- Starters – Sizes 0, 1 and 3 inclusive
- Breakers – 100 and 150 ampere frame sizes
- Motor Circuit Protectors – 100 ampere frame size

## Options:

The following special options are available from factory by adding suffix to Cat. No. and many are available in kit form or for field addition to existing units: See page 471 for listing of kits

| Description                                                                                         | Suffix |
|-----------------------------------------------------------------------------------------------------|--------|
| Control circuit transformer<br>600/480/240–120 volts, 50 or<br>60 hertz (Sizes 0 and 1 – 100–50 VA) |        |
| Fusible – Secondary.....                                                                            | FT     |
| Fusible – Primary and secondary.....                                                                | FTPS   |
| Auxiliary Contacts on Starter or<br>Contactor*                                                      |        |
| 1 N.O./1 N.C. ....                                                                                  | S781   |
| 2 N.O./2 N.C. ....                                                                                  | S782   |
| 3 N.O./3 N.C. ....                                                                                  | S783   |
| Auxiliary Switch on Circuit Breaker or<br>Motor Circuit Protector*                                  |        |
| 1A/1B (1P2T) .....                                                                                  | S784   |
| 2A/2B (2P2T) .....                                                                                  | S785   |
| Side bosses drilled and tapped<br>same size as standard hubs<br>(except 15" dia. – 1" size).....    | S366   |
| Back boss drilled and tapped<br>same size as standard hubs<br>(except 15" dia. – 1" size).....      | S367   |
| Pushbuttons (heavy duty):<br>START-STOP .....                                                       | PB3    |



Assembled unit

Separated view  
showing major  
components

| Description                                                                                         | Suffix  |
|-----------------------------------------------------------------------------------------------------|---------|
| Selector switches (standard duty):                                                                  |         |
| ON-OFF .....                                                                                        | RR2     |
| HAND-OFF-AUTO .....                                                                                 | RR3     |
| Pilot lights:                                                                                       |         |
| Red, 120 volt .....                                                                                 | J1      |
| Green, 120 volt .....                                                                               | J3      |
| LED pilot lights, in place of standard<br>incandescent lamps.....                                   | LED     |
| Pilot light transformers:                                                                           |         |
| 240 volt† .....                                                                                     | T2      |
| 480 volt† .....                                                                                     | T4      |
| 600 volt† .....                                                                                     | T5      |
| Space heaters:                                                                                      |         |
| 120 volt .....                                                                                      | R11     |
| 240 volt .....                                                                                      | R22     |
| 480 volt .....                                                                                      | R44     |
| Automatic reset overload relay .....                                                                | S1      |
| Less overload relays (lighting<br>contactor).....                                                   | CL      |
| Less overload relays (motor contactor)                                                              | CM      |
| Separate AC control circuit .....                                                                   | Specify |
| Insulated neutral with 2 connectors<br>(50, 100 & 225 amp) .....                                    | S146    |
| Grounded neutral stud with 3<br>connectors (50, 100 & 225 amp) .....                                | S178    |
| Pilot light holes drilled, tapped and<br>plugged for future addition of pilot<br>lights             |         |
| One hole.....                                                                                       | S541    |
| Two holes.....                                                                                      | S542    |
| Standard Breather (Class I, Groups C,<br>D, Class II, Groups E, F, G, Class III) ...                | S219    |
| Standard Drain (Class I, Groups C, D,<br>Class II, Groups E, F, G, Class III) .....                 | S198    |
| Standard Breather and Drain (Class I,<br>Groups C, D, Class II, Groups E, F, G,<br>Class III) ..... | S198V   |
| Universal Breather – Drain (Class I,<br>Groups C, D, Class II, Groups F, G).....                    | S454‡   |
| (2) Universal Breather – Drains (Class I,<br>Groups C, D, Class II, Groups F, G) .....              | S454V‡  |
| Less heaters.....                                                                                   | 0       |

\*Application is limited by starter, contactor, circuit breaker or motor circuit protector design – Consult Factory

† Required for pilot lights on other than 120 volt control circuits. One required for each lamp.

‡ Not suitable for NEMA 4.

**Crouse-Hinds**  
by **F.T.N**



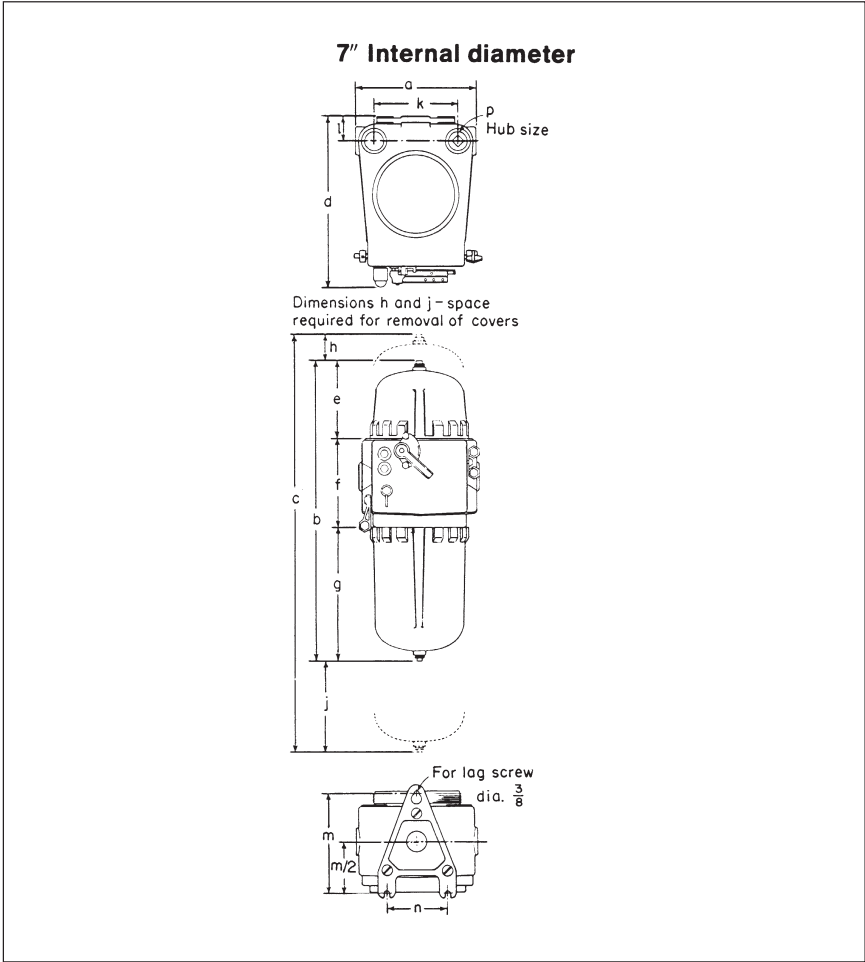
EPC Combination Line Starters and Enclosures

Dimensions\* (In Inches)

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

1C



1C

Single-Speed Non-Reversing Sizes 0, 1 and 3 starters

|           | EPC87                            | EPC87-FTPS or<br>EPC87-FT        |
|-----------|----------------------------------|----------------------------------|
| Int. Dia. | 7"                               | 7"                               |
|           | Dimensions                       | Dimensions†                      |
| a         | 10 <sup>9</sup> / <sub>16</sub>  | 10 <sup>9</sup> / <sub>16</sub>  |
| b         | 26 <sup>1</sup> / <sub>16</sub>  | 31 <sup>1</sup> / <sub>16</sub>  |
| c         | 35 <sup>11</sup> / <sub>16</sub> | 47 <sup>11</sup> / <sub>16</sub> |
| d         | 14 <sup>11</sup> / <sub>16</sub> | 14 <sup>11</sup> / <sub>16</sub> |
| e         | 6 <sup>3</sup> / <sub>4</sub>    | 11 <sup>3</sup> / <sub>4</sub>   |
| f         | 71 <sup>1</sup> / <sub>16</sub>  | 71 <sup>1</sup> / <sub>16</sub>  |
| g         | 11 <sup>5</sup> / <sub>8</sub>   | 11 <sup>5</sup> / <sub>8</sub>   |
| h         | 2                                | 9                                |
| j         | 7 <sup>5</sup> / <sub>8</sub>    | 7 <sup>5</sup> / <sub>8</sub>    |
| k         | 7 <sup>3</sup> / <sub>8</sub>    | 7 <sup>3</sup> / <sub>8</sub>    |
| l         | 2 <sup>1</sup> / <sub>16</sub>   | 2 <sup>1</sup> / <sub>16</sub>   |
| m         | 9 <sup>3</sup> / <sub>8</sub>    | 9 <sup>3</sup> / <sub>8</sub>    |
| n         | 5 <sup>1</sup> / <sub>4</sub>    | 5 <sup>1</sup> / <sub>4</sub>    |
| p         | 1 <sup>1</sup> / <sub>4</sub>    | 1 <sup>1</sup> / <sub>4</sub>    |

\*Dimensions are approximate, not for construction purposes.  
†For units with Control Circuit Transformer (suffix FT or FTPS).

# 1C

## EPC Combination Line Starters and Enclosures Single Speed, Non-Reversing with Circuit Breakers 3-Pole 60 hertz, 600 VAC Maximum

Cl. I, Div. 1 & 2, Groups C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 4, 7CD, 9EFG, 12 Watertight

### Ordering Information:

To order an enclosure complete with starter and breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown in the footnotes below.

Select the complete Cat. No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Enclosures only can be ordered. Select from listings below.

Instantaneous magnetic trip circuit breakers (magnetic circuit interrupters) can be supplied. Consult factory.

For combination starters with motor circuit protectors or single speed, non-reversing motors see page 457.

| Motor Starter     |       |           | Circuit Breaker |       | Enclosure    |               |       | Without Starter & Circuit Breaker Cat. # | With Starter & Circuit Breaker Cat. # § |
|-------------------|-------|-----------|-----------------|-------|--------------|---------------|-------|------------------------------------------|-----------------------------------------|
| Max. HP Polyphase | Volts | NEMA Size | Amp Rating      | Frame | Hub Size in. | Int. Dia. in. |       |                                          |                                         |
| 2                 | 120   | 0         | 30              | EB    | 1¼           | 7             | EPC87 | EPC870                                   | ①30ED ②613                              |
| 3                 | 240   | 0         | 20              | EHD   | 1¼           | 7             | EPC87 | EPC870                                   | ①20EHD ②623                             |
| 3                 | 480   | 0         | 15              | EHD   | 1¼           | 7             | EPC87 | EPC870                                   | ①15EHD ②643                             |
| 3                 | 480   | 0         | 15              | FDB   | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②643                              |
| 3                 | 600   | 0         | 15              | FD    | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②653                              |
| 5                 | 240   | 1         | 30              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①30EHD ②623                             |
| 5                 | 480   | 0         | 15              | EHD   | 1¼           | 7             | EPC87 | EPC870                                   | ①15EHD ②643                             |
| 5                 | 480   | 0         | 15              | FDB   | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②643                              |
| 5                 | 600   | 0         | 15              | FDB   | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②653                              |
| 7½                | 240   | 1         | 50              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①50EHD ②623                             |
| 7½                | 480   | 1         | 30              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①30EHD ②643                             |
| 7½                | 480   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②643                              |
| 7½                | 600   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②653                              |
| 10                | 480   | 1         | 30              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①30EHD ②643                             |
| 10                | 480   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②643                              |
| 10                | 600   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②653                              |

①Circuit Breakers:

| Manufacturer     | Symbol | Frames 100/150AMP |      |         |
|------------------|--------|-------------------|------|---------|
|                  |        | 240V              | 480V | 600V    |
| General Electric | TT     | TEB               | TED* | TED*    |
| Cutler-Hammer    | WT     | EHD               | EHD  | FB, FDB |

\*Specify Voltage

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

§ Starters are furnished with three heaters when heater ratings are fully specified.

# EPC Combination Line Starters

Single-Speed Non-Reversing  
with Motor Circuit Protectors  
3-Pole 60 hertz, 600 VAC Maximum

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

1C

## Ordering Information:

Select the complete Catalog No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motors or specify ampere rating of heaters.

Current limiters may be ordered by specification\*.

| Motor Starter |       |      | Enclosure with Motor Circuit Protector and Starter § |                     |
|---------------|-------|------|------------------------------------------------------|---------------------|
| Max. HP       |       | NEMA | Amp                                                  |                     |
| Polyphase     | Volts | Size | Rating                                               | Cat. #              |
| 3             | 240   | 0    | 15                                                   | EPC870 ①15HMCP ②623 |
| 3             | 480   | 0    | 7                                                    | EPC870 ①7HMCP ②643  |
| 3             | 600   | 0    | 7                                                    | EPC870 ①7HMCP ②653  |
| 5             | 480   | 0    | 15                                                   | EPC870 ①15HMCP ②643 |
| 5             | 600   | 0    | 15                                                   | EPC870 ①15HMCP ②653 |
| 7½            | 240   | 1    | 30                                                   | EPC871 ①30HMCP ②623 |
| 7½            | 480   | 1    | 15                                                   | EPC871 ①15HMCP ②643 |
| 10            | 600   | 1    | 15                                                   | EPC871 ①15HMCP ②653 |
| 10            | 480   | 1    | 30                                                   | EPC871 ①30HMCP ②643 |

①Motor Circuit Protectors

| Manufacturer     | Symbol |
|------------------|--------|
| General Electric | TP     |
| Square D         | DP     |
| Cutler-Hammer    | WP     |

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

\*General Electric or Cutler-Hammer MCPs only.

§ Starters are furnished with three heaters when heater ratings are fully specified.

1C

# 1C NMC Combination Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Applications:

- NMC combination magnetic line starters are for use in across-the-line motor starting, motor disconnect, motor and line protection and start-stop operations.

## Features:

- Enclosures are made of Krydon® high impact strength fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat.
- Unitized, strong and durable enclosure construction provides longer service life for equipment.
- Provided with top and bottom mounting feet.
- Enclosure has hinged access door which opens 160° for easy wiring and maintenance. Three screws for door frame are hidden behind access door.
- Access door may be padlocked to prevent unauthorized access.

## Certifications and Compliances:

- NEMA/EEMAC: 3, 4X and 12

## Electrical Rating Ranges:

- 3-pole, 60 hertz, 600 VAC max.
- Starters – sizes 0, 1, 2, 3, 4
- Breakers – 100, 150, 225 and 250 amp frame
- Switches – 30, 60, 100 amp
- Motor circuit protectors – 15, 30, 50, 100, 150 amp



Combination line starter with optional  
START-STOP pushbuttons –  
open view



Combination line starter with optional  
START-STOP pushbuttons –  
closed view

## Options:

| Description                                                                                                                                       | Suffix |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Control circuit transformer<br>480/240-120 volts, 50 or<br>60 hertz, (Sizes 0 and 1 – 50VA,<br>Size 2 – 100VA, Size 3 – 150VA,<br>Size 4 – 300VA) |        |
| Fusible                                                                                                                                           |        |
| Secondary.....                                                                                                                                    | FT     |
| Primary and secondary.....                                                                                                                        | FTPS   |
| Auxiliary Contact on Starter<br>or Contactor*                                                                                                     |        |
| 1NO/1NC.....                                                                                                                                      | S781   |
| 2 NO/2 NC.....                                                                                                                                    | S782   |
| 3 NO/3 NC.....                                                                                                                                    | S783   |
| Auxiliary Switch on Circuit<br>Breaker or Motor<br>Circuit Protector*                                                                             |        |
| 1A/1B .....                                                                                                                                       | S784   |
| 2A/2B .....                                                                                                                                       | S785   |
| Time delay low voltage release<br>for 3-wire control with 2, 4 or 6-<br>second adjustment. For single-<br>speed, non-reversing starters only.     |        |
| Control circuit voltage:                                                                                                                          |        |
| 120 volt, 60 hertz.....                                                                                                                           | LVR1†  |
| 240 volt, 60 hertz.....                                                                                                                           | LVR2†  |
| 480 volt, 60 hertz.....                                                                                                                           | LVR4†  |

| Description                                                                                             | Suffix  |
|---------------------------------------------------------------------------------------------------------|---------|
| Pilot lights, 120 V primary –<br>specify other primary voltages<br>as required:                         |         |
| Red pilot light.....                                                                                    | J1      |
| Green pilot light.....                                                                                  | J3      |
| LED pilot lights in place of<br>standard incandescent pilot lamps                                       | LED     |
| Pushbutton (heavy duty,<br>uses two device holes):                                                      |         |
| START-STOP.....                                                                                         | PB13    |
| Selector Switch (heavy duty)                                                                            |         |
| ON-OFF.....                                                                                             | RR17    |
| HAND-OFF-AUTO.....                                                                                      | RR18    |
| JOG-RUN-OFF.....                                                                                        | RR19    |
| Padlock attachment for:                                                                                 |         |
| Pushbutton.....                                                                                         | S708    |
| Automatic reset overload relay.....                                                                     | S1      |
| Less overload relays (contactor).....                                                                   | C       |
| Separate AC control circuit.....                                                                        | Specify |
| Insulated, groundable type terminal<br>block for grounded or ungrounded<br>neutral can be supplied..... | S618    |
| Hubs (see "NOTE ON HUBS") –<br>see page 677                                                             |         |
| Grounding plate or bushing –<br>see page 677                                                            |         |

\*Application limited by Size 5 starter, contactor or circuit  
breaker design – consult factory.  
†Option not available on NMC1024B.

**NOTE ON HUBS:** The following number and sizes of hubs (not mounted) are included when combination starters are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Starter Size | Number Included | Hub Size     |
|--------------|-----------------|--------------|
| 0            | 3               | 3/4          |
| 1            | 1<br>2          | 3/4<br>1     |
| 2            | 1<br>2          | 3/4<br>1 1/2 |
| 3            | 1<br>2          | 3/4<br>2     |
| 4            | 1<br>2          | 3/4<br>2 1/2 |

**Crouse-Hinds**  
by **Eaton**

# NMC Combination Line Starters and Enclosures

**Single-Speed, Non-Reversing  
600VAC Heavy Duty**

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

**1C**

## Ordering Information - With Circuit Breakers

To order an enclosure complete with starter and breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown in the footnotes.

Select the complete Cat. No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters. Starters are furnished with three heaters.

Enclosures only can be ordered. Select from listings below. Specific reference table is shown in the listings below. Instantaneous magnetic trip circuit breakers (magnetic circuit interrupters) can be supplied.

| Motor Starter     |             |           | Circuit Breaker   |       | Enclosure                             |                                          |
|-------------------|-------------|-----------|-------------------|-------|---------------------------------------|------------------------------------------|
| Max. HP Polyphase | Volts (A-C) | NEMA Size | Trip Setting Amps | Frame | With Starter & Circuit Breaker Cat. # | Without Starter & Circuit Breaker Cat. # |
| 2                 | 120         | 0         | 30                | EB    | NMC1024B ①30EB ②6130                  | NMC1024B                                 |
| 2                 | 240         | 0         | 15                | EB    | NMC1024B ①15EB ②6230                  | NMC1024B                                 |
| 3                 | 240         | 0         | 20                | EB    | NMC1024B ①20EB ②6230                  | NMC1024B                                 |
| 5                 | 240         | 1         | 30                | EB    | NMC1024B ①30EB ②6231                  | NMC1024B                                 |
| 5                 | 480         | 0         | 15                | EHD   | NMC1024B ①15EBH ②6430                 | NMC1024B                                 |
| 5                 | 600         | 0         | 15                | FDB   | NMC1024B ①15FB ②6530                  | NMC1024B                                 |
| 7½                | 240         | 1         | 50                | EB    | NMC1024B ①50EB ②6231                  | NMC1024B                                 |
| 7½                | 480         | 1         | 20                | EHD   | NMC1024B ①20EBH ②6431                 | NMC1024B                                 |
| 7½                | 600         | 1         | 20                | FDB   | NMC1024B ①20FB ②6531                  | NMC1024B                                 |
| 10                | 240         | 2         | 60                | EB    | NMC1024B2 ①60EB ②6232                 | NMC1024B2                                |
| 10                | 480         | 1         | 30                | EHD   | NMC1024B ①30EBH ②6431                 | NMC1024B                                 |
| 10                | 600         | 1         | 30                | FDB   | NMC1024B ①30FB ②6531                  | NMC1024B                                 |
| 15                | 240         | 2         | 80                | EB    | NMC1024B2 ①80EB ②6232                 | NMC1024B2                                |
| 15                | 480         | 2         | 40                | EHD   | NMC1024B2 ①40EBH ②6432                | NMC1024B2                                |
| 15                | 600         | 1         | 40                | FDB   | NMC1024B ①40FB ②6531                  | NMC1024B                                 |
| 20                | 240         | 3         | 80                | EB    | NMC1426B ①80EB ②6233                  | NMC1426B                                 |
| 20                | 480         | 2         | 60                | EHD   | NMC1024B2 ①60EBH ②6432                | NMC1024B2                                |
| 20                | 600         | 2         | 50                | FDB   | NMC1024B2 ①50FB ②6532                 | NMC1024B2                                |
| 25                | 240         | 3         | 80                | EB    | NMC1426B ①80EB ②6233                  | NMC1426B                                 |
| 25                | 480         | 2         | 70                | EHD   | NMC1024B2 ①70EBH ②6432                | NMC1024B2                                |
| 25                | 600         | 2         | 60                | FDB   | NMC1024B2 ①60FB ②6532                 | NMC1024B2                                |
| 30                | 240         | 4         | 125               | JDB‡  | NMC2426B ①125JB ②6234                 | NMC2426B                                 |
| 30                | 480         | 3         | 80                | EHD   | NMC1426B ①80EBH ②6433                 | NMC1426B                                 |
| 30                | 600         | 3         | 60                | FDB   | NMC1426B ①60FB ②6533                  | NMC1426B                                 |
| 40                | 240         | 4         | 150               | JDB‡  | NMC2426B ①150JB ②6234                 | NMC2426B                                 |
| 40                | 480         | 3         | 80                | EHD   | NMC1426B ①80EBH ②6433                 | NMC1426B                                 |
| 40                | 600         | 3         | 80                | FDB   | NMC1426B ①80FB ②6533                  | NMC1426B                                 |
| 50                | 240         | 4         | 200               | JDB‡  | NMC2426B ①200JB ②6234                 | NMC2426B                                 |
| 50                | 480         | 3         | 100               | EHD   | NMC1426B ①100EBH ②6433                | NMC1426B                                 |
| 50                | 600         | 3         | 100               | FDB   | NMC1426B ①100FB ②6533                 | NMC1426B                                 |
| 60                | 480         | 4         | 125               | JDB‡  | NMC2426B ①125JB ②6434                 | NMC2426B                                 |
| 60                | 600         | 4         | 100               | JDB‡  | NMC2426B ①100JB ②6534                 | NMC2426B                                 |
| 75                | 480         | 4         | 150               | JDB‡  | NMC2426B ①150JB ②6434                 | NMC2426B                                 |
| 75                | 600         | 4         | 125               | JDB‡  | NMC2426B ①125JB ②6534                 | NMC2426B                                 |
| 100               | 480         | 4         | 175               | JDB‡  | NMC2426B ①175JB ②6434                 | NMC2426B                                 |
| 100               | 600         | 4         | 150               | JDB‡  | NMC2426B ①150JB ②6534                 | NMC2426B                                 |

①Circuit Breakers:

| Manufacturer     | Symbol | Frames           |          |         |                  |
|------------------|--------|------------------|----------|---------|------------------|
|                  |        | 100/150A<br>240V | 480V     | 600V    | 225/250A<br>600V |
| General Electric | TT     | TEB              | TED§     | TED§    | TFJ              |
| Square D         | DT     | FAL§             | FAL§     | FAL§    | KAL              |
| Cutler-Hammer    | WT     | EB               | EBH, EHD | FB, FDB | JB, JDB          |

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

Information on other starter manufacturers on request.

**NOTE ON HUBS:** See page 458.

§Specify voltage.

‡Formerly "JB"

**Crouse-Hinds**

by **E•T•N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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## 1C

# NMC Combination Line Starters and Enclosures

Single-Speed, Non-Reversing  
600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Ordering Information - With Motor Circuit Protector

| Motor Starter        |               |              | Enclosure                |                               |                                 |
|----------------------|---------------|--------------|--------------------------|-------------------------------|---------------------------------|
| Max. HP<br>Polyphase | Volts<br>(AC) | NEMA<br>Size | MCP Trip<br>Setting Amps | With Starter &<br>MCP Cat. #§ | Without Starter &<br>MCP Cat. # |
| 3                    | 240           | 0            | 15                       | NMC1024B ①15MCP ②6230         | NMC1024B                        |
| 5                    | 480           | 0            | 15                       | NMC1024B ①15MCP ②6430         | NMC1024B                        |
| 5                    | 600           | 0            | 15                       | NMC1024B ①15MCP ②6530         | NMC1024B                        |
| 7½                   | 240           | 1            | 30                       | NMC1024B ①30MCP ②6231         | NMC1024B                        |
| 10                   | 480           | 1            | 30                       | NMC1024B ①30MCP ②6431         | NMC1024B                        |
| 10                   | 600           | 1            | 30                       | NMC1024B ①30MCP ②6531         | NMC1024B                        |
| 15                   | 240           | 2            | 50                       | NMC1024B2 ①50MCP ②6232        | NMC1024B2                       |
| 25                   | 480           | 2            | 50                       | NMC1024B2 ①50MCP ②6432        | NMC1024B2                       |
| 25                   | 600           | 2            | 50                       | NMC1024B2 ①50MCP ②6532        | NMC1024B2                       |
| 30                   | 240           | 3            | 100                      | NMC1426B ①100MCP ②6233        | NMC1426B                        |
| 50                   | 480           | 3            | 100                      | NMC1426B ①100MCP ②6433        | NMC1426B                        |
| 50                   | 600           | 3            | 100                      | NMC1426B ①100MCP ②6533        | NMC1426B                        |
| 50                   | 240           | 4            | 150                      | NMC2426P ①150MCP ②6234        | NMC2426P                        |
| 100                  | 480           | 4            | 150                      | NMC2426P ①150MCP ②6434        | NMC2426P                        |
| 100                  | 600           | 4            | 150                      | NMC2426P ①150MCP ②6534        | NMC2426P                        |

①Motor Circuit Protectors:

| Manufacturer     | Symbol |
|------------------|--------|
| General Electric | G      |
| Cutler-Hammer    | W      |

**NOTE ON HUBS:** See page 458.

§ With motor circuit protector only. For motor circuit protector with current limiter – information on request.

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

Information on other starter manufacturers on request.

## Ordering Information - With Non-fusible Disconnect Switch

To order an enclosure complete with disconnect switch, insert the manufacturer's symbol in the designated positions of the catalog number. Symbols are shown in the footnotes.

Enclosures only can be ordered. Select from listings below.

| Motor Starter        |               |              | Non-fusible<br>Disconnect<br>Switch | Enclosure                                  |                                               |
|----------------------|---------------|--------------|-------------------------------------|--------------------------------------------|-----------------------------------------------|
| Max. HP<br>Polyphase | Volts<br>(AC) | NEMA<br>Size | Switch<br>Size-Amps                 | With Starter & Disconnect Switch<br>Cat. # | Without Starter & Disconnect Switch<br>Cat. # |
| 3                    | 240           | 0            | 30                                  | NMC1024D ①30 ②6230                         | NMC1024D ①                                    |
| 5                    | 480           | 0            | 30                                  | NMC1024D ①30 ②6430                         | NMC1024D ①                                    |
| 5                    | 600           | 0            | 30                                  | NMC1024D ①30 ②6530                         | NMC1024D ①                                    |
| 7½                   | 240           | 1            | 30                                  | NMC1024D ①30 ②6231                         | NMC1024D ①                                    |
| 10                   | 480           | 1            | 30                                  | NMC1024D ①30 ②6431                         | NMC1024D ①                                    |
| 10                   | 600           | 1            | 30                                  | NMC1024D ①30 ②6531                         | NMC1024D ①                                    |
| 15                   | 240           | 2            | 60                                  | NMC1426D ①60 ②6232                         | NMC1426D ①                                    |
| 25                   | 480           | 2            | 60                                  | NMC1426D ①60 ②6432                         | NMC1426D ①                                    |
| 25                   | 600           | 2            | 60                                  | NMC1426D ①60 ②6532                         | NMC1426D ①                                    |
| 30                   | 240           | 3            | 100                                 | NMC2426D ①100 ②6233                        | NMC2426D ①                                    |
| 50                   | 480           | 3            | 100                                 | NMC2426D ①100 ②6433                        | NMC2426D ①                                    |
| 50                   | 600           | 3            | 100                                 | NMC2426D ①100 ②6533                        | NMC2426D ①                                    |

①Disconnect Switches:

| Manufacturer     | Symbol | Switch Type |
|------------------|--------|-------------|
| General Electric | G      | Type QMW    |
| Square D         | D      | Class 9422  |
| Cutler-Hammer    | W      | Type DS     |

**NOTE ON HUBS:** See page 458.

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

Information on other starter manufacturers on request.



# NMC Combination Line Starters and Enclosures

Single-Speed, Non-Reversing  
600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

1C

## Ordering Information - With Fusible Disconnect Switch

| Motor Starter     |          |           | Fusible Disconnect Switch |                       | Enclosure                                |                                            |
|-------------------|----------|-----------|---------------------------|-----------------------|------------------------------------------|--------------------------------------------|
| Max. HP Polyphase | Volts AC | NEMA Size | Switch Size-Amps          | Fuse Clip Rating-Amps | With Starter & Disconnect Switch Cat. #■ | Without Starter & Disconnect Switch Cat. # |
| 3                 | 240      | 0         | 30                        | 30                    | NMC1024D ①3030 ②6230                     | NMC1024D ①                                 |
| 5                 | 480      | 0         | 30                        | 30                    | NMC1024D ①3030 ②6430                     | NMC1024D ①                                 |
| 5                 | 600      | 0         | 30                        | 30                    | NMC1024D ①3030 ②6530                     | NMC1024D ①                                 |
| 7½                | 240      | 1         | 30                        | 30                    | NMC1024D ①3030 ②6231                     | NMC1024D ①                                 |
| 7½                | 240      | 1         | 30                        | 60                    | NMC1024D ①3060 ②6231                     | NMC1024D ①                                 |
| 10                | 480      | 1         | 30                        | 30                    | NMC1024D ①3030 ②6431                     | NMC1024D ①                                 |
| 10                | 480      | 1         | 30                        | 60                    | NMC1024D ①3060 ②6431                     | NMC1024D ①                                 |
| 10                | 600      | 1         | 30                        | 30                    | NMC1024D ①3030 ②6531                     | NMC1024D ①                                 |
| 10                | 600      | 1         | 30                        | 60                    | NMC1024D ①3060 ②6531                     | NMC1024D ①                                 |
| 15                | 240      | 2         | 60                        | 60                    | NMC1426D ①6060 ②6232                     | NMC1426D ①                                 |
| 15                | 240      | 2         | 60                        | 100                   | NMC1426D ①6010 ②6232                     | NMC1426D ①                                 |
| 25                | 480      | 2         | 60                        | 60                    | NMC1426D ①6060 ②6432                     | NMC1426D ①                                 |
| 25                | 480      | 2         | 60                        | 100                   | NMC1426D ①6010 ②6432                     | NMC1426D ①                                 |
| 25                | 600      | 2         | 60                        | 60                    | NMC1426D ①6060 ②6532                     | NMC1426D ①                                 |
| 25                | 600      | 2         | 60                        | 100                   | NMC1426D ①6010 ②6532                     | NMC1426D ①                                 |
| 30                | 240      | 3         | 100                       | 100                   | NMC2426D ①1010 ②6233                     | NMC2426D ①                                 |
| 50                | 480      | 3         | 100                       | 100                   | NMC2426D ①1010 ②6433                     | NMC2426D ①                                 |
| 50                | 480      | 3         | 100                       | 200                   | NMC2426D ①1020 ②6433                     | NMC2426D ①                                 |
| 50                | 600      | 3         | 100                       | 100                   | NMC2426D ①1010 ②6533                     | NMC2426D ①                                 |

①Disconnect Switches:

| Manufacturer     | Switch Type | Symbol |
|------------------|-------------|--------|
| General Electric | Type QMW    | G      |
| Square D         | Class 9422  | D      |
| Cutler-Hammer    | Type DS     | W      |

**NOTE ON HUBS:** See page 458.

■ Fuse clips are arranged for Class H fuses and field modifiable for Class J fuses. For Class R fuses, consult Eaton's Crouse-Hinds.

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

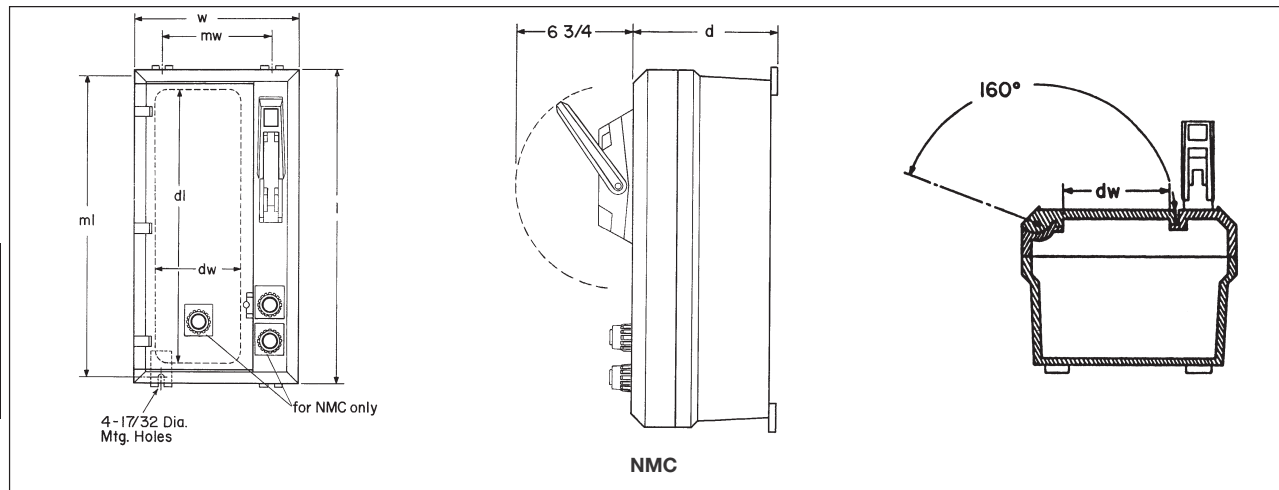
Information on other starter manufacturers on request.

1C

# 1C NMC Combination Line Starters and Enclosures

## Dimensions

In Inches:



| Cat. #         | Outside Dimensions |                   |                  | Mounting Dimensions |                 | Door Opening Dimensions |                   |
|----------------|--------------------|-------------------|------------------|---------------------|-----------------|-------------------------|-------------------|
|                | $l$                | $w$               | $d$              | $mw$                | $ml$            | $dl$                    | $dw$              |
| <b>NMC1024</b> | $25\frac{13}{32}$  | $11\frac{13}{32}$ | $8\frac{23}{32}$ | $7\frac{1}{8}$      | $25\frac{3}{8}$ | $22\frac{7}{8}$         | $5\frac{11}{16}$  |
| <b>NMC1426</b> | $27\frac{13}{32}$  | $15\frac{13}{32}$ | $9\frac{23}{32}$ | $11\frac{7}{8}$     | $27\frac{1}{4}$ | $23\frac{11}{16}$       | $9\frac{11}{16}$  |
| <b>NMC2426</b> | $27\frac{13}{32}$  | $25\frac{13}{32}$ | $9\frac{23}{32}$ | $21\frac{3}{4}$     | $27\frac{1}{4}$ | $23\frac{11}{16}$       | $19\frac{11}{16}$ |

| Description                                 | Page No.          |
|---------------------------------------------|-------------------|
| Application/Selection                       | see page 464      |
| Magnetic Line Starters & Enclosures         |                   |
| Single speed, non-reversing                 |                   |
| EBMS Series                                 | see pages 465–466 |
| EPC Series                                  | see pages 469–470 |
| NMG Series                                  | see pages 488–489 |
| Manual Line Starters & Enclosures           |                   |
| EMN NEMA Series                             | see pages 472–473 |
| EMN IEC Series                              | see page 474      |
| EMN Series                                  | see page 475      |
| NMN Series                                  | see page 487      |
| Manual Motor Starting Switches & Enclosures |                   |
| GUSC Series                                 | see page 476      |
| EFD Series                                  | see page 477      |
| MC Series                                   | see pages 483–484 |
| EDS Series                                  | see pages 478–480 |
| GHG 635 Series                              | see pages 481–482 |
| NSSC / NFSC                                 | see page 485      |
| Special Feature Kits                        |                   |
| For EPC Series                              | see page 471      |



### Application and Selection Quick Selector Chart

#### Applications:

Line starters are housed in enclosures suitable for specific environments, and are used for:

- Across-the-line starting of motors
- Motor running protection
- Undervoltage protection
- Remote or manual starting and stopping

#### Selection:

Considerations for selection of proper enclosure:

- The environment of the enclosure location in accordance with NEC/CEC and NEMA/EEMAC requirements
- The characteristics of the starter to be enclosed
- See "Quick-Selector" below for guidance

#### Options:

Many options are available on:

- Material and finishes where special atmospheric conditions prevail
- Special features for specific applications. See individual listings for available options, many of which are available in kit form for field addition to existing units.

#### Quick Selector Chart

| Enclosures for Starters |                                                                                                                |                           |              |                                                     |                                 |                                                                    |                                         |
|-------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------|--------------|-----------------------------------------------------|---------------------------------|--------------------------------------------------------------------|-----------------------------------------|
| Enclosures              | NEC/CEC – Hazardous Area Compliance                                                                            | NEMA/EEMAC Enclosure Type | Starter Type | NEMA/EEMAC Size Starters Single Speed Non-reversing | Motor Phase and Type            | Manufacturers Equipment Enclosed – Starter                         | Cover Type                              |
| MC                      | None                                                                                                           | 3, 4, 12                  | Manual       |                                                     | Single-AC                       | Cutler-Hammer                                                      | Gasketed                                |
| EPC                     | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III     | 3, 4, 7CD, 9EFG, 12       | Magnetic     | 0-2                                                 | Poly-AC                         | Allen-Bradley<br>Cutler-Hammer<br>G.E.<br>Square D                 | Threaded                                |
| EBMS                    | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III  | 3, 4, 7BCD, 9EFG, 12      | Magnetic     | 0-5                                                 | Poly-AC                         | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer                 | Bolted/<br>Ground<br>Joint/<br>Gasketed |
| EMN<br>NEMA             | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1 & 2, Groups E, F, G<br>Cl. III                                | 3, 4, 4X†, 7(CD), 9(EFG)  | Manual       | 0-1P                                                | DC and<br>Single and<br>Poly-AC | G.E.<br>Square D                                                   | Bolted                                  |
| EMN IEC                 | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1 & 2, Groups E, F, G<br>Cl. III                                | 3, 4, 4X†, 7(CD), 9(EFG)  | Manual       |                                                     | Single and<br>Poly-AC           | Cutler-Hammer                                                      | Bolted                                  |
| EMN                     | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III     | 3, 7CD, 9EFG, 12          | Manual       | 0-1P                                                | Single and<br>Poly-AC           | Allen-Bradley<br>Cutler-Hammer<br>G.E.<br>Square D                 | Bolted/<br>Ground<br>Joint              |
| GUSC                    | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III     | 3, 7CD, 9EFG, 12          | Manual       | 3, 7½, 15, 20                                       | Single-AC                       |                                                                    | Threaded                                |
| EDS,<br>EDSC‡           | Cl. I, Div. 1 & 2, Groups B*, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7CD, 9EFG, 12          | Manual       |                                                     | DC and<br>Single AC             | Allen-Bradley<br>G.E.<br>Cutler-Hammer                             | Bolted/<br>Ground<br>Joint              |
| EFD                     | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III  | 3, 7BCD, 9EFG, 12         | Manual       |                                                     | DC and<br>Single and<br>Poly-AC | G.E.<br>Square D                                                   | Bolted/<br>Ground<br>Joint              |
| NSSC /<br>NFSC          | None                                                                                                           | 3, 4X, 12                 | Manual       |                                                     | DC and<br>Single and<br>Poly-AC | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer                 | Screw and<br>gasket                     |
| NMN                     | None                                                                                                           | 3, 4X, 12                 | Manual       | 0-1P                                                | Single AC                       | Allen-Bradley<br>G.E.<br>Square D                                  | Screw and<br>gasket                     |
| NMG                     | None                                                                                                           | 3, 4X, 12                 | Manual       | 0-4                                                 | Poly-AC                         | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer<br>Westinghouse | Hinged,<br>screw and<br>gasket          |

\*Check listings for Group B suitability.

†NEMA 4X rated when ordered with epoxy powder coating.

‡For factory sealed units see pages 536–537.

# EBMS Magnetic Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**2C**

## Applications:

Spectrum™ EBM hinged cover motor control enclosures are used:

- For general motor control – indoors or outdoors – in damp, wet, dirty, dusty hazardous locations, without the need for a protective shelter.
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent.
- For across-the-line starting, stopping, speed changing and reversing of polyphase AC induction motors.
- To provide motor overload and undervoltage protection.
- On switchracks or other assemblies where it's desired that motor control be centrally located.

## Features:

- Rugged, corrosion resistant, cast copper-free aluminum construction (less than 0.4 of 1%).
- Motor starter operating handle located through the right side wall of the body permits visual confirmation of correct component assembly and operation.
- Total compliance to the wiring end room requirements of the National Electrical Code® and Canadian Electrical Code.
- Semi-clamshell enclosure design, with an external flanged ground joint between body and cover makes interior components more accessible.
- Minimum enclosure-to-enclosure spacing with little interference between the opened cover and an adjacent enclosure.
- Copper-free aluminum hinges allow the cover to swing well out of the way.
- Stainless steel, quick release, captive, hex head cover bolts. Stainless steel springs provide clear indication cover bolts are fully retracted from body.
- Versatile, internal operating mechanisms allow for field adjustment to accommodate popular manufacturers' starters.
- Simple, straightforward installation of starter on pre-drilled mounting plate within enclosure. Mounting plate also field removable.
- Neoprene cover gasket permanently attached to the cover seals out moisture.
- Bodies have top and bottom drilled and tapped entrances for power conduits plus one at the bottom for control conduit. Removable reducers are supplied as standard, to accommodate smaller size conduits. All conduit entrances are plugged.
- Tap-on mounting feet.
- Optional EMPS control devices may be added to enclosure cover.
- Steel bracket for lifting larger enclosures during installation supplied as standard.



**Spectrum EBM motor control enclosures accommodate popular makes of starters.**

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- UL Standards: UL1203
- NEMA: 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shaft and bushing – stainless steel
- Interior parts – sheet steel, electrogalvanized
- Cover bolts, washers and retractile springs – stainless steel

## Electrical Rating Range:

- Motor starters – NEMA/EEMAC sizes 0–5

$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.  
 $\dagger\dagger$ With S752 or S753.

National Electrical Code is a Registered Trademark of the National Fire Protection Association.

## Options:

The following options are available from the factory by adding suffix to catalog number. Suffixes are added alphanumerically.

### Catalog Number System Example

EBMS1FB-①-W6413-②

① Options in this position are additions to the enclosures and should be listed alphanumerically.

② Options in this position are modifications to the motor starter and should be listed alphanumerically.

| Description                                                                                                                                                                                   | Position in Cat. # | Suffix  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------|
| • Less Overload Relays (lighting contactor) .....                                                                                                                                             | ①                  | CL      |
| • Less Overload Relays (motor contactor) .....                                                                                                                                                | ①                  | CM      |
| • Control Circuit Transformer, 100VA for NEMA/EEMAC sizes 0-2, 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not included) ..... | ①                  | FTPS100 |
| • Control Circuit Transformer, 200VA for NEMA/EEMAC size 3, 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not included) .....    | ①                  | FTPS200 |
| • Control Circuit Transformer, 300VA for NEMA/EEMAC size 4, 5 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not included) .....  | ①                  | FTPS300 |
| • Pilot Light, 120VAC, Red Jewel, w/blank indicating plate .....                                                                                                                              | ①                  | J1③     |
| • Pilot Light, 120VAC, Green Jewel, w/blank indicating plate .....                                                                                                                            | ①                  | J3③     |
| • Less Heaters in Starter Overload Relay .....                                                                                                                                                | ②                  | 0       |
| • Start-Stop Pushbuttons (requires 2 spaces) .....                                                                                                                                            | ①                  | PB23③‡  |
| • On-Off Selector Switch .....                                                                                                                                                                | ①                  | RR2③‡   |
| • Hand-Off-Auto Selector Switch .....                                                                                                                                                         | ①                  | RR3③‡   |
| • Space Heater, 120 Volt, 25 Watts .....                                                                                                                                                      | ①                  | R11     |
| • Space Heater, 240 Volt, 25 Watts .....                                                                                                                                                      | ①                  | R22     |
| • Space Heater, 480 Volt, 25 Watts .....                                                                                                                                                      | ①                  | R44     |
| • Automatic Reset Overload Relay .....                                                                                                                                                        | ①                  | S1      |
| • Std. Drain, Class I, B, C&D; Class II, EF&G; Class III .....                                                                                                                                | ①                  | S756‡   |
| • Std. Breather & Drain, Class I, B, C&D; Class II, EF&G; Class III .....                                                                                                                     | ①                  | S756V‡  |
| • External Epoxy Finish .....                                                                                                                                                                 | ①                  | S752    |
| • Internal and External Epoxy Finish .....                                                                                                                                                    | ①                  | S753    |
| • Additional control contacts, N.O. or N.C. – for single speed, non-reversing starters only (number limited by design of starter. Details on specific makes and sizes on request.)            |                    |         |
| Aux. Contacts on starter 1 N.O. & 1 N.C. ....                                                                                                                                                 | ②                  | S781    |
| Aux. Contacts on starter 2 N.O. & 2 C. ....                                                                                                                                                   | ②                  | S782    |
| Aux. Contacts on starter 3 N.O. & 3 N.C. ....                                                                                                                                                 | ②                  | S783    |
| 12 Point Term. Block – 30 Amp, 300V .....                                                                                                                                                     | ①                  | S786    |
| • General Purpose Control Relay, 4 Pole N.O., contacts rated 10A @ 600V, coil 120VAC, 50-60 Hz .....                                                                                          | ①                  | S787*   |

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

③ When specifying non-standard markings on any one of the following options with Spectrum™ EBM Motor Controls (J1, J3, PB23, RR2, RR3) it is necessary to order DSL Legend Plates for identification and marking of the device(s) being used. See page 449 for DSL Legend Plate listings.

\* Use of this option with NEMA/EEMAC Size 0 or 1 starters necessitates a larger enclosure. Use "B" size enclosures.

### Example:

|                 | Enclosure        | Enclosure for  |
|-----------------|------------------|----------------|
| Without Starter | Cat. #<br>EBMSFA | S787<br>EBMSFB |

# EBMS Magnetic Line Starters and Enclosures

**Single-Speed Non-Reversing  
3-Pole 60 hertz, 600 VAC Maximum**

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**2C**

## Ordering Information:

- To order an enclosure complete with motor starter, insert the manufacturer's symbol in the designated position (see ‡) of the catalog number. Symbols are shown in the footnotes.
- Also specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.
- Enclosures without starters may be ordered. Select from the listings below.

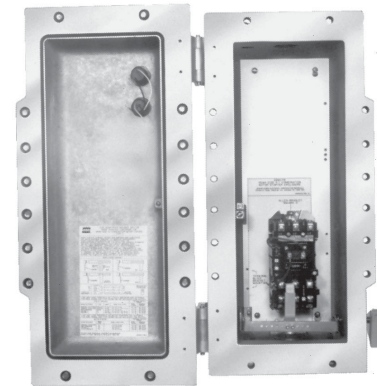
## EBMS Series Enclosures for Magnetic Line Starters Single Speed Non-Reversing

| Motor Starter        |       |              | Enclosure                    |                             |
|----------------------|-------|--------------|------------------------------|-----------------------------|
| Max. HP<br>Polyphase | Volts | NEMA<br>Size | Without<br>Starter<br>Cat. # | With<br>Starter<br>Cat. # § |
| 2                    | 120   | 0            | EBMSFA                       | EBMS0FA ①613                |
| 3                    | 120   | 1            | EBMSFA                       | EBMS1FA ①613                |
| 3                    | 240   | 0            | EBMSFA                       | EBMS0FA ①623                |
| 5                    | 480   | 0            | EBMSFA                       | EBMS0FA ①643                |
| 5                    | 600   | 0            | EBMSFA                       | EBMS0FA ①663                |
| 7½                   | 120   | 2            | EBMSFB                       | EBMS2FB ①613                |
| 7½                   | 240   | 1            | EBMSFA                       | EBMS1FA ①623                |
| 10                   | 480   | 1            | EBMSFA                       | EBMS1FA ①643                |
| 10                   | 600   | 1            | EBMSFA                       | EBMS1FA ①663                |
| 15                   | 120   | 3            | EBMSFH                       | EBMS3FH ①613                |
| 15                   | 240   | 2            | EBMSFB                       | EBMS2FB ①623                |
| 25                   | 480   | 2            | EBMSFB                       | EBMS2FB ①643                |
| 25                   | 600   | 2            | EBMSFB                       | EBMS2FB ①663                |
| 30                   | 240   | 3            | EBMSFH                       | EBMS3FH ①623                |
| 50                   | 480   | 3            | EBMSFH                       | EBMS3FH ①643                |
| 50                   | 600   | 3            | EBMSFH                       | EBMS3FH ①663                |
| 50                   | 240   | 4            | EBMSFH                       | EBMS4FH ①623                |
| 100                  | 480   | 4            | EBMSFH                       | EBMS4FH ①643                |
| 100                  | 600   | 4            | EBMSFH                       | EBMS4FH ①663                |
| 100                  | 240   | 5            | EBMSFL                       | EBMS5FL ①623                |
| 200                  | 480   | 5            | EBMSFL                       | EBMS5FL ①643                |
| 200                  | 600   | 5            | EBMSFL                       | EBMS5FL ①663                |

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§ Motor starters are furnished with three heaters when heater ratings are fully specified.



EBMS Series starter enclosures are available with magnetic line starters. NEMA sizes 0–5.

①Motor starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |



# EBMS Magnetic Line Starters and Enclosures

Dimensions (In Inches)

Cl. I, Div. 1 & 2, Groups B, C, D

Cl. II, Div. 1, Groups E, F, G

Cl. II, Div. 2, Groups F, G

Cl. III

NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

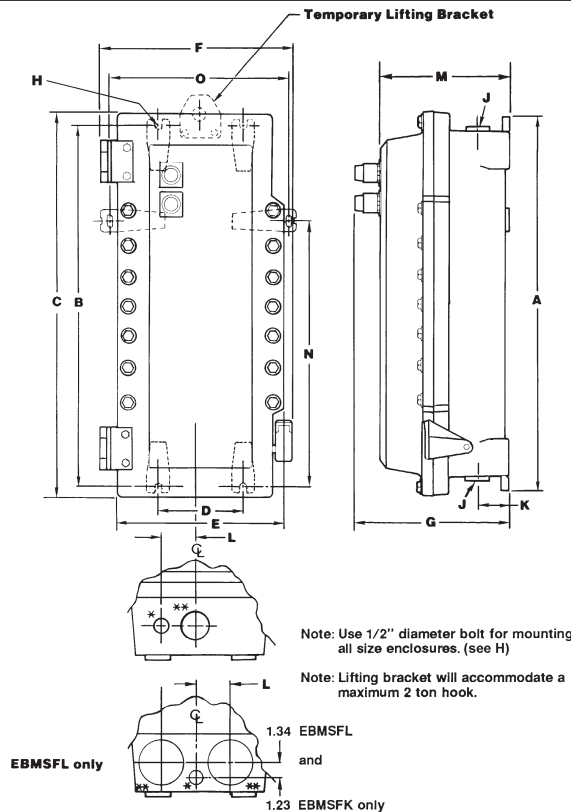
Explosionproof

Dust-Ignitionproof

Raintight

Wet Locations

Watertight



Dimensions are approximate, not for construction purposes.

## Single-Speed Non-Reversing Sizes 0, 1, 2, 3, 4 and 5 Starters

| Enclosure Only Cat. #         | Enclosure Size Symbol | A     | B     | C     | D     | E     | F     | G     | J** Conduit Entry Trade Size D&T | w/RE     | K    | L    | M     | N     | O     |
|-------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|----------------------------------|----------|------|------|-------|-------|-------|
| <b>Size 0,1 FVNR Starter§</b> |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFA                        | A                     | 18.25 | 17.25 | 19.00 | 6.00  | 12.63 | 14.38 | 12.13 | 2"                               | 1.5"     | 3.25 | 3.13 | 10.25 | —     | —     |
| <b>Size 2 FVNR Starter</b>    |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFB                        | B                     | 25.75 | 24.75 | 26.50 | 6.00  | 12.63 | 14.38 | 12.13 | 2"                               | 1.5"     | 3.25 | 3.13 | 10.25 | —     | —     |
| <b>Size 3,4 FVNR Starter</b>  |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFD $\dagger$              | D                     | 28.25 | 27.25 | 29.00 | 6.00  | 12.63 | 14.06 | 12.13 | 3"                               | 2.5"     | 3.25 | 3.13 | 10.25 | —     | —     |
| EBMSFH                        | H                     | 37.50 | 36.50 | 38.25 | 6.00  | 14.25 | 16.00 | 13.54 | 3"                               | 2.5"     | 3.25 | 3.94 | 11.66 | —     | —     |
| <b>Size 5 FVNR Starter</b>    |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFK $\dagger$              | K                     | 43.12 | 41.50 | 42.25 | 12.00 | 17.25 | 19.88 | 11.00 | (2) 3"                           | (2) 2.5" | 3.25 | 3.00 | 10.78 | —     | —     |
| EBMSFL                        | L                     | 53.25 | 51.50 | 52.88 | 12.00 | 17.50 | 20.18 | 15.00 | (2) 4"                           | (2) 3.5" | 4.00 | 3.50 | 13.03 | 41.50 | 18.00 |

§Use EBMSFB enclosure when S787 option is ordered with size 0 or 1 starter.

\*1" Drilled & Tapped conduit entry for control conductors supplied with PLG plug (top & bottom)

\*\*Conduit entrance for power conductors (top and bottom). (All conduit entrances supplied with RE reducer and PLG plug.)

$\dagger$ For Cutler-Hammer W200 Advantage® starters.

■Drilled & Tapped.

$\ddagger$  Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\dagger\dagger$ With S752 or S753.

# EPC Magnetic Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

2C

## Applications:

EPC magnetic line starters and enclosures are used:

- For across-the-line starting of polyphase AC induction motors
- In locations made hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide motor running protection, undervoltage protection, and remote starting and stopping

## Features:

- Quick-opening covers – less than two turns to remove or install
- Three section design for ease of installation
- Water-shedding construction with female threads on top cover, male threads on bottom cover, and top cover skirted
- Specially located stops and locks ensure adequate thread engagement and prevent overtightening
- Separate replaceable mounting bracket attached to the rear of the body provides three-point suspension for quick installation and leveling – one keyhole slot at top and two open slots at bottom
- Bodies have two taper tapped conduit hubs with integral bushings on the top, and two more directly below
- Universal mounting plate and reset mechanism will accommodate any of the motor starters in catalog listing
- When interior mounting plate is removed, line and load conductors are easily pulled into the wiring chamber. The interior assembly with starter attached is then replaced, final connections made, and covers assembled
- Furnished with third overload relay as standard

## Certifications and Compliances:

- NEC/CEC  
Class I, Division 1 & 2, Groups C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA/EEMAC: 3, 4, 7CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Bodies and covers – copper-free aluminum
- Reset handle – copper-free aluminum
- Reset shaft – stainless steel
- Interior parts – stainless steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized with chromate finish

## Electrical Rating Range:

- Starter Sizes 0 to 1 inclusive

## Options:

The following special options are available from factory by adding suffix to Cat. No. and many are available in kit form for field addition to existing units: See page 471 for listing of kits

### Description

Control circuit transformer 600/480/240–120 volts, 50 or 60 hertz

(Sizes 0 and 1 – 50VA, 100VA) Fusible – Secondary .....

Primary and secondary .....

Automatic reset overload relay .....

Less overload relays (lighting contactor) .....

Less overload relays (motor contactor) .....

Auxiliary Contacts:\*

1NO/1NC .....

2NO/2NC .....

3NO/3NC .....

Pilot light holes drilled, tapped and plugged for future addition of pilot lights –

one hole .....

two holes .....

Side bosses drilled and tapped same size as standard hubs .....

Back boss drilled and tapped same size as standard hubs .....

Standard Breather (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....

Standard Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....

Standard Breather and Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....

Universal Breather-Drain (Cl. I, Groups C, D; Cl. II, Groups F, G) .....

(2) Universal-Breather Drains (Cl. I, Groups C, D; Cl. II, Groups F, G) .....

Pushbuttons (heavy duty):

START-STOP .....

Selector switches (standard duty):

ON-OFF .....

HAND-OFF-AUTO.....

Pilot lights:

Red, 120 volt .....

Green, 120 volt .....

Pilot light transformers:

240 volt† .....

480 volt† .....

600 volt† .....

Space heaters:

120 volt .....

240 volt .....

480 volt .....

### Suffix

FT

FPTS

S1

CL

CM

S781

S782

S783

S541

S542

S366

S367

S219

S198

S198V

S454†

S454V†

PB3†

RR2†

RR3†

J1

J3

T2

T4

T5

R11

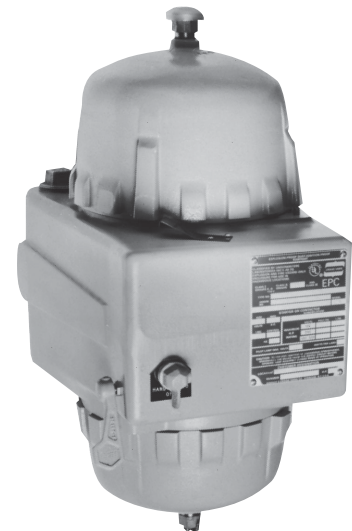
R22

R44

\*Application limited by starter or contactor design – consult factory.

†Required for pilot lights on other than 120 volt control circuits. One required for each lamp.

‡Not suitable for NEMA 4.



2C

## Crouse-Hinds

by **E•T•N**

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469

# EPC Magnetic Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

## Ordering Information:

To order an enclosure complete with starter, insert the manufacturer's symbol in the designated position of the catalog number. Symbols are shown in the footnote at the bottom of this page. Specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Enclosures only can be ordered. Select from listings.

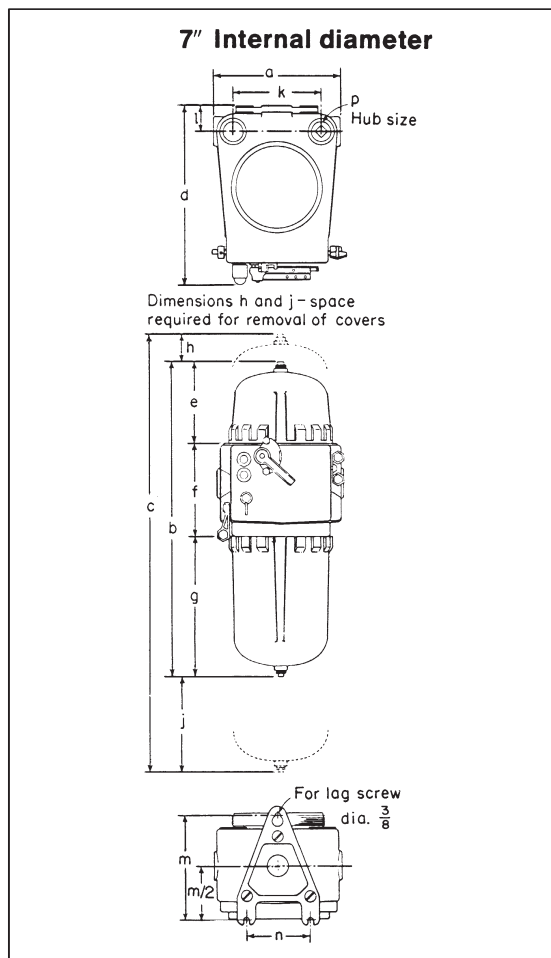
| Motor Starter |            |      | Enclosure |          |         |             |                  |        |
|---------------|------------|------|-----------|----------|---------|-------------|------------------|--------|
| Max. HP       | NEMA/EEMAC |      | Hub       | Int.     | Without | With        | ①Motor Starters: |        |
| Polyphase     | Volts      | Size | Size in.  | Dia. in. | Starter | Starter     | Manufacturer     | Symbol |
|               |            |      |           |          | Cat. #  | Cat. # §    |                  |        |
| 2             | 120        | 0    | 1¼        | 7        | EPC97   | EPC970 ①613 | Allen-Bradley    | AB     |
| 3             | 120        | 1    | 1¼        | 7        | EPC97   | EPC971 ①613 | General Electric | G      |
| 3             | 240        | 0    | 1¼        | 7        | EPC97   | EPC970 ①623 | Square D         | D      |
| 5             | 480        | 0    | 1¼        | 7        | EPC97   | EPC970 ①643 | Cutler-Hammer    | W      |
| 5             | 600        | 0    | 1¼        | 7        | EPC97   | EPC970 ①653 |                  |        |
| 7½            | 240        | 1    | 1¼        | 7        | EPC97   | EPC971 ①623 |                  |        |
| 10            | 480        | 1    | 1¼        | 7        | EPC97   | EPC971 ①643 |                  |        |
| 10            | 600        | 1    | 1¼        | 7        | EPC97   | EPC971 ①653 |                  |        |

①Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

## Dimensions

In Inches\*:



## Single-Speed Non-Reversing Sizes 0, 1, Starters

|           | EPC97                            | EPC97-FT<br>EPC97-FTPS           |
|-----------|----------------------------------|----------------------------------|
| Int. Dia. | 7"                               | 7"                               |
|           | Dimensions                       | Dimensions†                      |
| a         | 10 <sup>5</sup> / <sub>8</sub>   | 10 <sup>5</sup> / <sub>8</sub>   |
| b         | 19 <sup>13</sup> / <sub>16</sub> | 24 <sup>13</sup> / <sub>16</sub> |
| c         | 25 <sup>13</sup> / <sub>16</sub> | 37 <sup>13</sup> / <sub>16</sub> |
| d         | 14 <sup>11</sup> / <sub>16</sub> | 14 <sup>11</sup> / <sub>16</sub> |
| e         | 6 <sup>3</sup> / <sub>4</sub>    | 11 <sup>3</sup> / <sub>4</sub>   |
| f         | 7 <sup>11</sup> / <sub>16</sub>  | 7 <sup>11</sup> / <sub>16</sub>  |
| g         | 5 <sup>3</sup> / <sub>8</sub>    | 5 <sup>3</sup> / <sub>8</sub>    |
| h         | 2                                | 9                                |
| j         | 4                                | 4                                |
| k         | 7 <sup>3</sup> / <sub>8</sub>    | 7 <sup>3</sup> / <sub>8</sub>    |
| l         | 2 <sup>1</sup> / <sub>16</sub>   | 2 <sup>1</sup> / <sub>16</sub>   |
| m         | 9 <sup>3</sup> / <sub>8</sub>    | 9 <sup>3</sup> / <sub>8</sub>    |
| n         | 5 <sup>1</sup> / <sub>4</sub>    | 5 <sup>1</sup> / <sub>4</sub>    |
| p         | 1 <sup>1</sup> / <sub>4</sub>    | 1 <sup>1</sup> / <sub>4</sub>    |

\*Dimensions are approximate, not for construction.

†For units with Control Circuit Transformer (suffix FT or FTPS).

§ Starters are furnished with three heaters when heater ratings are fully specified.

**Crouse-Hinds**  
by **Eaton**

# EPC Magnetic Line Starters and Enclosures

2C

## Special Feature Kits

### Pushbutton Station and Selector Switch Kits

EPC magnetic line starter and EPC combination line starter enclosures are provided as standard with switch operating shaft holes drilled, tapped and plugged. Pushbutton stations and selector switches can be assembled in these enclosures in the field, using kits listed below.

Applies to 7" and 11" EPC

| Description                                         | Cat. #             |
|-----------------------------------------------------|--------------------|
| START-STOP pushbutton station assembly              | <b>EPC PB3 KIT</b> |
| Replacement pushbutton station only for EPC-PB3-KIT | <b>16320 N</b>     |
| ON-OFF selector switch assembly (2 position)        | <b>EPC RR2 KIT</b> |
| Replacement switch only for EPC-RR2-KIT             | <b>ESWP126</b>     |
| HAND-OFF-AUTO selector switch assembly (3 position) | <b>EPC RR3 KIT</b> |
| Replacement switch only for EPC-RR3-KIT             | <b>ESWP126</b>     |

### Pilot Light Kits

When EPC magnetic line starter and EPC combination line starter enclosures have been ordered with pilot light holes drilled, tapped and plugged (Cat. No. suffix S541 and S542), pilot lights can be assembled in the field, using kits listed below.

| Description                                                                                                      | Applies to   | Cat. #                  |
|------------------------------------------------------------------------------------------------------------------|--------------|-------------------------|
| Pilot light assembly less transformer                                                                            | 7", 11" EPC  | <b>EMP015 ① KIT</b>     |
| Pilot light assemblies with transformer and transformer mounting strap (for single pilot light) suffix S541      | 7" EPC only  | <b>EPC87 ① ② KIT</b>    |
|                                                                                                                  | 11" EPC only | <b>EPC813 ① ② KIT</b>   |
| 2 pilot light assemblies with 2 transformers and transformer mounting strap (for double pilot light) suffix S542 | 7" EPC only  | <b>EPC87 ① ① ② KIT</b>  |
|                                                                                                                  | 11" EPC only | <b>EPC813 ① ① ② KIT</b> |
| Replacement pilot light transformer only (240V primary)                                                          | All units    | <b>15129 A</b>          |
| Replacement pilot light transformer only (480V primary)                                                          | All units    | <b>15130 A</b>          |
| Replacement pilot light transformer only (600V primary)                                                          | All units    | <b>15131 A</b>          |

①Insert color symbol from table below and

②add primary voltage symbol

Example: EPC87-①-①-②-KIT with red and green pilot lights for 480 volts is EPC-J1-J3-T4-KIT.

| Color   | Symbol | Color | Symbol |
|---------|--------|-------|--------|
| Red     | J1     | Clear | J10    |
| Green   | J3     | Blue  | J11    |
| Amber   | J6     |       |        |
| Voltage | Symbol |       |        |
| 240     | T2     |       |        |
| 480     | T4     |       |        |
| 600     | T5     |       |        |

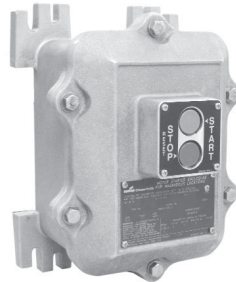
# EMN Series Pushbutton Style Compact Manual NEMA Starters

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X\*, 7(CD), 9(EFG)  
UL/cUL Listed

Explosionproof  
Wet Locations

## Applications:

- Explosionproof compact across-the-line manual NEMA starters for single and polyphase VAC or VDC motors
- Used on drilling rigs for mud agitators and shakers where flammable or explosive gases are present
- Also used for fans and blowers, pumps, compressors, and conveyors



## Features:

- Built to protect from mud and hose-directed water - NEMA 4
- Robust protection for start-stop buttons
- Option for no top entries for further protection from water ingress
- Pushbutton can be locked in "OFF" position
- Versatile mounting footprint accommodates field retrofit

## Catalog Numbering System:

| SERIES | ENCLOSURE TYPE | STARTER | OPTIONS† |
|--------|----------------|---------|----------|
| EMN    | 25             | D31     | S198V    |

SERIES  
EMN Explosionproof Compact Manual Motor Starter

ENCLOSURE TYPE  
25 Compact Pushbutton Enclosure pre-drilled for Square D starter  
27 Compact Pushbutton Enclosure pre-drilled for GE starter

STARTER  
D31 D = Square D and G = GE, followed by number of poles and NEMA size

## Certifications and Compliances:

- Class I, Division 1 & 2, Groups C, D
- Class II, Division 1 & 2, Groups E, F, G
- Class III
- NEMA 3, 4, 4X\*, 7(CD), 9(EFG)
- UL Standard: 1203
- cUL Standard: C22.2 No. 30

## Standard Materials:

- Enclosure – copper-free aluminum
- Shaft, bearing, and bolts – stainless steel
- O-ring gasket – Buna-N

## Electrical Ratings:

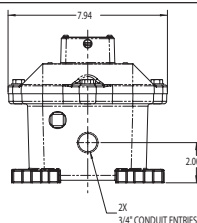
- NEMA starter sizes 0, 1, and 1P
- 1 to 10 HP

| NO. OF POLES | NEMA SIZE | MOTOR VOLTAGE | MAX. HORSEPOWER |            |     | CATALOG NUMBER |
|--------------|-----------|---------------|-----------------|------------|-----|----------------|
|              |           |               | SINGLE PHASE    | POLY-PHASE | DC  |                |
| 2            | 0         | 115           | 1               |            |     | EMN25 D20      |
|              |           | 230           | 2               |            |     |                |
|              | 1         | 115           | 2               |            |     | EMN25 D21      |
|              |           | 230           | 3               |            |     |                |
|              | 1P        | 115           | 3               |            |     | EMN25 D21P     |
|              |           | 230           | 5               |            |     |                |
| 3            | 0         | 200-230       |                 | 3          |     | EMN25 D30      |
|              |           | 380-575       |                 | 5          |     |                |
|              | 1         | 200-230       |                 | 7-½        |     | EMN25 D31      |
|              |           | 380-575       |                 | 10         |     |                |
| 2 DC         | 0         | 115           |                 |            | 1   | EMN25 D20DC    |
|              |           | 230           |                 |            | 1-½ |                |
|              | 1         | 115           |                 |            | 1-½ | EMN25 D21DC    |
|              |           | 230           |                 |            | 2   |                |

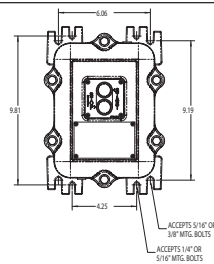
OPTIONS  
S752 Gray Epoxy Powder Coating, outside only  
S753 Gray Epoxy Powder Coating, outside and inside  
S198V Breather (ECD-N4B) and Drain (ECD-N4D)  
NTE No Top Entries

† Add heater suffix. See next page for heater tables.

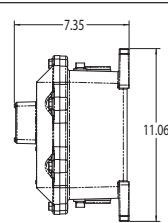
## Dimensions In Inches:



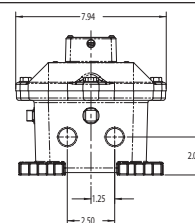
Top/Bottom View



Cover View



Side View



Bottom View  
No Top Entry Option

\*NEMA 4X rated when ordered with epoxy powder coating.

# EMN Series Pushbutton Style Compact Manual NEMA Starters

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X\*, 7(CD), 9(EFG)  
UL/cUL Listed

Explosionproof  
Wet Locations

2C

Select heater elements based on motor nameplate listed Full Load Amps (FLA). Trip rating of elements is 125% of motor minimum FLA listed for the elements. One heater is furnished with two-pole AC or DC starters and three heaters with three-pole starters.

## Heater Table (Square D)

| Suffix                                                | Motor Full-Load Current (A) |             |
|-------------------------------------------------------|-----------------------------|-------------|
|                                                       | 1 PH                        | 3 PH        |
| Following Selections for Size M-0, M-1, and M-1P Only |                             |             |
| B44                                                   | 0.33-0.36                   | 0.29-0.32   |
| B51                                                   | 0.37-0.40                   | 0.33-0.36   |
| B57                                                   | 0.41-0.45                   | 0.37-0.39   |
| B63                                                   | 0.46-0.52                   | 0.40-0.47   |
| B71                                                   | 0.53-0.59                   | 0.48-0.56   |
| B81                                                   | 0.60-0.66                   | 0.57-0.63   |
| B92                                                   | 0.67-0.73                   | 0.64-0.69   |
| B103                                                  | 0.74-0.81                   | 0.70-0.77   |
| B116                                                  | 0.82-0.91                   | 0.78-0.86   |
| B130                                                  | 0.92-1.02                   | 0.87-0.96   |
| B145                                                  | 1.03-1.14                   | 0.97-1.11   |
| B167                                                  | 1.15-1.29                   | 1.12-1.23   |
| B188                                                  | 1.20-1.42                   | 1.24-1.37   |
| B210                                                  | 1.43-1.64                   | 1.38-1.55   |
| B240                                                  | 1.65-1.80                   | 1.56-1.75   |
| B265                                                  | 1.81-2.10                   | 1.76-1.92   |
| B300                                                  | 2.11-3.20                   | 1.93-2.16   |
| B330                                                  | 2.31-2.61                   | 2.17-2.50   |
| B370                                                  | 2.62-2.99                   | 2.51-2.81   |
| B415                                                  | 3.00-3.37                   | 2.82-3.16   |
| B485                                                  | 3.38-3.94                   | 3.17-3.40   |
| B550                                                  | 3.95-4.24                   | 3.41-3.76   |
| B625                                                  | 4.25-4.54                   | 3.77-4.00   |
| B690                                                  | 4.55-5.29                   | 4.01-4.68   |
| B770                                                  | 5.30-5.73                   | 4.69-5.18   |
| B820                                                  | 5.74-6.35                   | 5.19-5.51   |
| B910                                                  | 6.36-7.08                   | 5.52-6.19   |
| B102                                                  | 7.09-7.83                   | 6.20-7.12   |
| B115                                                  | 7.84-8.47                   | 7.13-8.15   |
| B128                                                  | 8.48-9.83                   | 8.16-8.60   |
| B140                                                  | 9.84-10.50                  | 8.61-9.21   |
| B155                                                  | 10.60-11.40                 | 9.22-10.10  |
| B175                                                  | 11.50-12.80                 | 10.20-11.20 |
| B195                                                  | 12.90-13.90                 | 11.30-12.00 |
| B220                                                  | 14.00-16.10                 |             |
| B250                                                  | 16.20-18.00                 |             |
| Following Selections for Size M-1 and M-1P Only       |                             |             |
| B195                                                  |                             | 11.30-12.10 |
| B220                                                  |                             | 12.20-13.60 |
| B250                                                  | 16.20-17.60                 | 13.70-15.30 |
| B280                                                  | 17.70-20.60                 | 15.40-17.30 |
| B320                                                  | 20.70-23.10                 | 17.40-19.10 |
| B360                                                  | 23.20-26.00                 | 19.20-21.70 |
| B400                                                  |                             | 21.80-24.20 |
| B450                                                  |                             | 24.30-26.00 |
| Following Selections for Size M-1P Only               |                             |             |
| B360                                                  | 23.20-27.10                 |             |
| B400                                                  | 27.20-29.20                 |             |
| B450                                                  | 29.30-33.00                 |             |
| B500                                                  | 33.10-36.00                 |             |

## Heater Table (General Electric)

| Suffix                                         | Max. Motor Full-Load Current (A) |       |
|------------------------------------------------|----------------------------------|-------|
|                                                | 1 PH                             | 3 PH  |
| Following Selections for Size M-0 and M-1 Only |                                  |       |
| 36A                                            | 0.34                             | 0.29  |
| 39A                                            | 0.37                             | 0.31  |
| 43A                                            | 0.42                             | 0.34  |
| 48A                                            | 0.47                             | 0.40  |
| 54A                                            | 0.52                             | 0.44  |
| 60A                                            | 0.57                             | 0.48  |
| 66A                                            | 0.63                             | 0.52  |
| 71A                                            | 0.69                             | 0.58  |
| 78A                                            | 0.77                             | 0.64  |
| 87A                                            | 0.87                             | 0.71  |
| 97A                                            | 0.97                             | 0.81  |
| 109A                                           | 1.06                             | 0.89  |
| 118A                                           | 1.18                             | 0.98  |
| 131A                                           | 1.33                             | 1.12  |
| 148A                                           | 1.47                             | 1.22  |
| 163A                                           | 1.66                             | 1.38  |
| 184A                                           | 1.78                             | 1.48  |
| 196A                                           | 2.00                             | 1.66  |
| 220A                                           | 2.18                             | 1.80  |
| 239A                                           | 2.45                             | 2.03  |
| 268A                                           | 2.76                             | 2.28  |
| 301A                                           | 3.00                             | 2.47  |
| 326A                                           | 3.27                             | 2.71  |
| 356A                                           | 3.49                             | 2.87  |
| 379A                                           | 3.86                             | 3.18  |
| 419A                                           | 4.30                             | 3.54  |
| 466A                                           | 4.88                             | 3.89  |
| 526A                                           | 5.49                             | 4.51  |
| 592A                                           | 5.85                             | 4.90  |
| 630A                                           | 6.45                             | 5.30  |
| 695A                                           | 7.22                             | 5.94  |
| 778A                                           | 8.05                             | 6.70  |
| 867A                                           | 8.88                             | 7.36  |
| 955A                                           | 9.66                             | 7.98  |
| 104B                                           | 10.50                            | 8.59  |
| 113B                                           | 11.60                            | 9.46  |
| 125B                                           | 12.70                            | 10.30 |
| 137B                                           | 13.20                            | 11.70 |
| 151B                                           | 15.10                            | 12.60 |
| 163B                                           | 16.60                            | 13.80 |
| 180B                                           | 17.60                            | 15.40 |
| 198B                                           |                                  | 16.60 |
| 214B                                           |                                  | 17.40 |
| Following Selections for Size M-1 Only         |                                  |       |
| 198B                                           | 19.80                            |       |
| 214B                                           | 21.10                            |       |
| 228B                                           | 23.10                            | 19.40 |
| 250B                                           | 25.20                            | 20.60 |
| 273B                                           |                                  | 22.00 |
| 303B                                           |                                  | 25.30 |
| Following Selections for Size M-1P Only        |                                  |       |
| 778A                                           | 8.56                             |       |
| 867A                                           | 9.43                             |       |
| 955A                                           | 10.30                            |       |
| 104B                                           | 11.00                            |       |
| 113B                                           | 12.10                            |       |
| 125B                                           | 13.20                            |       |
| 137B                                           | 15.00                            |       |
| 151B                                           | 16.20                            |       |
| 163B                                           | 17.70                            |       |
| 180B                                           | 19.70                            |       |
| 198B                                           | 21.20                            |       |
| 214B                                           | 22.20                            |       |
| 228B                                           | 24.90                            |       |
| 250B                                           | 26.40                            |       |
| 273B                                           | 30.00                            |       |
| 303B                                           | 32.70                            |       |
| 330B                                           | 34.00                            |       |

# EMN Series Pushbutton Style Compact Manual IEC Starters

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X†, 7(CD), 9(EFG)  
UL/cUL Listed

Explosionproof  
Wet Locations

## Applications:

- Explosionproof compact across-the-line starting and stopping for small single and polyphase AC motors
- Used for small machine tools, turbines, fans and blowers, pumps, compressors, and conveyors where ignitable dusts, fibers, or filings accumulate
- IEC starters are more precisely rated and, as a result, save users money during operation
- Sophisticated IEC design reduces risk of motor damage during a fault



## Catalog Numbering System:

| SERIES | ENCLOSURE TYPE | STARTER | OPTIONS |
|--------|----------------|---------|---------|
| EMN    | 26             | WP16    | S198V   |

### SERIES

EMN Explosionproof Compact Manual Motor Starter

### ENCLOSURE TYPE

26 Compact Pushbutton Enclosure pre-drilled for Cutler-Hammer™ Starter

### STARTER

WP16 W = Cutler-Hammer™ followed by starter type suffix

- WP16 = IEC, .16A
- W1P6 = IEC, 1.6A
- W012 = IEC, 12A

## Features:

- Built to protect from mud and hose-directed water - NEMA 4 and robust protection of buttons
- Option for no top entries for further protection from water ingress
- Pushbutton can be locked in "OFF" position
- Versatile mounting footprint accommodates field retrofit

## Certifications and Compliances:

- Class I, Division 1 & 2, Groups C, D
- Class II, Division 1 & 2, Groups E, F, G
- Class III
- NEMA 3, 4, 4X†, 7(CD), 9(EFG)
- UL Standard: 1203
- cUL Standard: C22.2 No. 30

## Standard Materials:

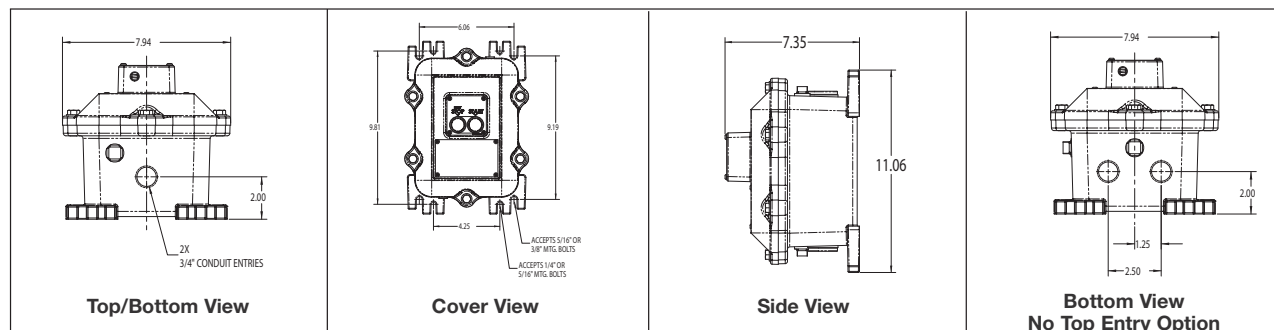
- Enclosure – copper-free aluminum
- Shaft, bearing, and bolts – stainless steel
- O-ring gasket – Buna-N

## Electrical Ratings:

- IEC Cutler-Hammer™ Type XTPB Manual Starter
- 1 to 15 HP

## Dimensions

In Inches:



†NEMA 4X rated when ordered with epoxy powder coating.

**Crouse-Hinds**  
by **E.T.N**



# EMN Series Manual Line Starters and Enclosures

600VAC Maximum

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

2C

## Applications:

EMN manual line starters and enclosures are used:

- For manual across-the-line starting of single and polyphase AC motors
- To provide motor running protection and manual starting and stopping
- In locations made hazardous due to the presence of flammable vapors, gases, or high combustible dusts
- For installation in petroleum refineries, chemical and petrochemical plants, and other process industry facilities
- In damp, wet, or corrosive locations

## Features:

- Compact, rectangular enclosure makes optimum use of internal space
- Operating handle may be padlocked in either "ON" or "OFF" position
- Compact design allows installation in area where space is limited
- Furnished with drilled and tapped conduit openings
- Polyphase manual starters are furnished with third overload relay as standard

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 14

## Standard Materials:

- Bodies, covers and toggle operator – copper-free aluminum
- Operating shaft – stainless steel
- Internal operating bail – sheet steel or aluminum

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized with chromate finish

## Electrical Rating Ranges:

- Starter sizes 0, 1, 1P

## Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                             | Suffix |
|-----------------------------------------------------------------------------------------|--------|
| Standard Breather (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....           | S219   |
| Standard Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....              | S198   |
| Standard Breather and Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) ..... | S198V  |
| Universal Breather-Drain (Cl. I, Groups C, D; Cl. II, Groups F, G) ....                 | S454   |
| (2) Universal Breather-Drains (Cl. I, Groups C, D; Cl. II, Groups F, G) ....            | S454V  |

## Ordering Information:

Specify HP, voltage, frequency, number of phases, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Two pole starters require one heater; three pole starters have three heaters.



2C

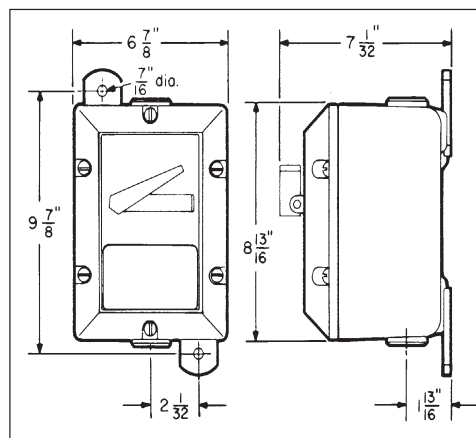
## Motor Starter

| NEMA Size | Poles (Phase) | Max. AC HP Ratings |          |          | Enclosure With Starter Cat. # |
|-----------|---------------|--------------------|----------|----------|-------------------------------|
|           |               | 115V               | 208/240V | 480/600V |                               |
| M-0       | 2 (1PH)       | 1                  | 2        |          | EMN24 W20                     |
| M-1       | 2 (1PH)       | 2                  | 3        |          | EMN24 W21                     |
| M-1P      | 2 (1PH)       | 3                  | 5        |          | EMN24 W21P                    |
| M-0       | 3 (3PH)       | 2                  | 3        | 5        | EMN24 W30                     |
|           | 3 (1PH)       | 2                  | 3        |          |                               |
| M-1       | 3 (3PH)       | 3                  | 7½       | 10       | EMN24 W31                     |

## Enclosure Without Starter

| Starter Manufacturer | Enclosure Cat. #† |
|----------------------|-------------------|
| Cutler-Hammer        | EMN24             |

## Dimensions\* In Inches:



†Enclosures are furnished with two 1¼" drilled and tapped openings with 1¼" to 1" reducers.  
\*Dimensions are approximate, not for construction purposes.

Cl. I, Div. 1 & 2, Groups C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 7CD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations

### Applications:

GUSC manual motor starters are used:

- In a rigid metallic conduit system for surface mounting adjacent to or remote from the equipment being controlled
- To prevent arcing of the enclosed switches from causing ignition of a specific hazardous atmosphere, or atmospheres, external to the enclosure
- In industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas, or metal handling or finishing areas where the atmosphere may contain hazardous gases and/or dust
- In non-hazardous areas where sturdy, durable enclosures are required

### Features:

- Enclosures are of rugged metal construction with mounting lugs and taper tapped hubs with integral bushings, in a through feed or bottom feed arrangement, for connection to the rigid metallic conduit
- Cover is threaded, which provides for fast and proper assembly
- Provided with a threaded operating shaft and bushing
- Provision is made to use a padlock with  $\frac{1}{4}$ " hasp, to lock the operating lever in an "ON" or "OFF" position
- Body and cover threads treated with lubricant at factory to provide raintightness

### Certifications and Comiances:

- NEC/CEC:
  - Class I, Div. 1 & 2, Groups C, D
  - Class II, Div. 1, Groups E, F, G
  - Class II, Div. 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2, No. 30

### Standard Materials:

- Body – *Feraloy*® iron alloy
- Cover – copper-free aluminum
- Shaft – stainless steel
- Shaft bushing – stainless steel

### Standard Finishes:

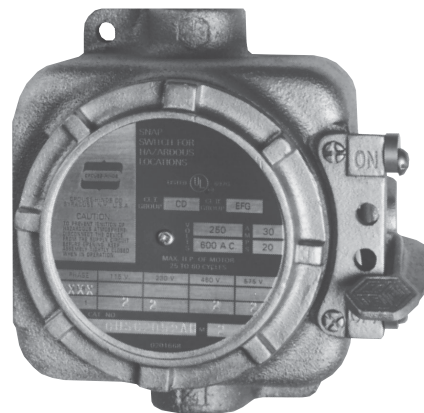
- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

### Size Ranges:

- Hub size –  $\frac{3}{4}$ " (through feed arrangement)

### Electrical Rating Ranges:

- See below



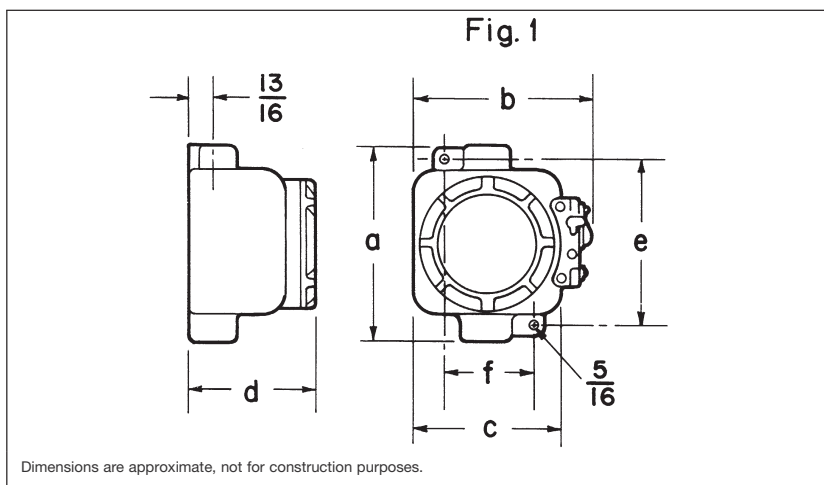
### Ordering Information:

| Cat. #       | Style  | Rating/Horsepower |                |                |                | Hub Size        |
|--------------|--------|-------------------|----------------|----------------|----------------|-----------------|
|              |        | 120VAC / 3 HP     | 240VAC / 7½ HP | 480VAC / 15 HP | 600VAC / 15 HP |                 |
| GUSC2013-MS* | 3-Pole | 30A               | 30A            | 30A            | 20A            | $\frac{3}{4}$ " |

| Cat. #      | Style  | Rating/Horsepower |                |                |                | Hub Size        |
|-------------|--------|-------------------|----------------|----------------|----------------|-----------------|
|             |        | 120VAC / 3 HP     | 240VAC / 7½ HP | 480VAC / 15 HP | 600VAC / 20 HP |                 |
| GUSC2036-MS | 3-Pole | 40A               | 40A            | 40A            | 40A            | $\frac{3}{4}$ " |

\*Also rated for 30A, 250VDC, 15 HP.

### Dimensions In Inches:



| Type                       | Size   | a               | b               | c              | d              | e              | f |
|----------------------------|--------|-----------------|-----------------|----------------|----------------|----------------|---|
| Through Feed Hubs – Fig. 1 |        |                 |                 |                |                |                |   |
|                            | 3-Pole | $6\frac{3}{16}$ | $6\frac{1}{16}$ | $4\frac{7}{8}$ | $4\frac{1}{8}$ | $5\frac{3}{8}$ | 3 |

# EFD Series Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 7B\*CD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations

2C

## Applications:

EFD manual motor starting and stopping switch enclosures are used:

- For manual starting of small AC or DC motors
- In locations made hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and in other process industry facilities where similar hazards exist

## Features:

- Enclosure is small and compact
- Accurately ground flange on both body and cover for flame-tight joint
- Switch can be padlocked in either "ON" or "OFF" positions
- Dead end (EFD) or through feed (EFDC) hubs in 3/4" to 1" size

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 7B\*CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Bodies and covers – Feraloy® iron alloy
- Operating handle – type 6 / 6 nylon
- Operating shaft – stainless steel

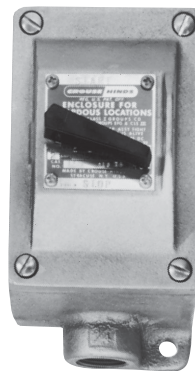
## Standard Finishes:

- Feraloy iron alloy – electrogalvanized and aluminum acrylic paint
- Type 6 / 6 nylon – natural (black)
- Stainless steel – natural

## Options:

The following special options are available from factory by adding suffix to Cat. #:

**Description** For use in Group B hazardous areas **Suffix** GB\*



EFD dead end



EFDC through feed

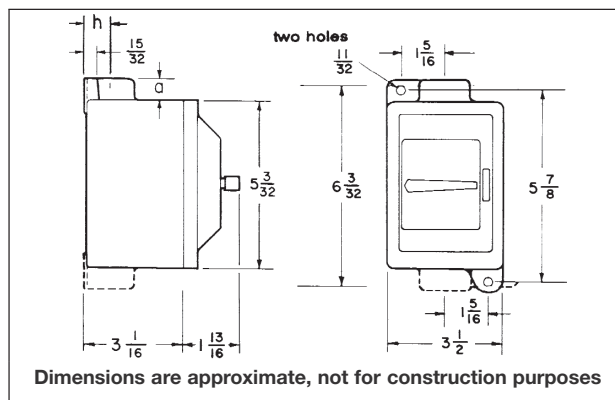
## Electrical Ratings Without Overload Protection With Switches

| Poles | Cat. #                               | Switch Ratings Amps      |        | HP                  |        |            |
|-------|--------------------------------------|--------------------------|--------|---------------------|--------|------------|
|       | <b>Square D Class 2510 Type KO-1</b> | 250VAC                   | 600VAC | 115VAC              | 230VAC | 460-575VAC |
| 2     |                                      | 30                       | 20     | 1                   | 2      | 3          |
| 3     | <b>GE TC2368S</b>                    | 30A., 240VAC, 7-1 / 2 hp |        | 20A., 600VAC, 15 hp |        |            |

## Ordering Information

| Dead end |              |                        |        | Through feed |              |                          |
|----------|--------------|------------------------|--------|--------------|--------------|--------------------------|
| Poles    | Hub Size in. | With Switch            | Cat. # | Poles        | Hub Size in. | With Switch Cat. #       |
| 2        | 3/4<br>1     | EFD218 T8<br>EFD318 T8 |        | 2            | 3/4<br>1     | EFDC218 T8<br>EFDC318 T8 |
| 3        | 3/4<br>1     | EFD2419<br>EFD3419     |        | 3            | 3/4<br>1     | EFDC2419<br>EFDC3419     |

## Dimensions In Inches:



| Hub Size | Dim. "h" | Dim. "a" |
|----------|----------|----------|
| 3/4      | 7/8      | 13/16    |
| 1        | 1        | 15/16    |

\*Add GB suffix. Seals must be installed within 1/2" of each conduit opening for Group B usage.

## Crouse-Hinds

by E.T.N

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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## EDS Series Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 NEMA 3, 7B\*CD, 9EFG

### Applications:

Factory sealed enclosures are installed in a rigid metallic conduit system for surface mounting adjacent to or remote from equipment being controlled and are used:

- To prevent arcing of enclosed device from causing ignition of a specific hazardous atmosphere or atmospheres external to the enclosure
  - In industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas, or metal handling or finishing areas where atmosphere may contain hazardous gases and/or dust
  - In non-hazardous areas where sturdy, durable enclosures are required
  - In conjunction with magnetic starters or contactors for remote control of motors
- Manual motor starting switch enclosures are used:
- For manual starting of small AC or DC motors
  - To provide manual starting and stopping and, in the case of units with heaters, motor running protection

### Features:

Factory sealed devices have many distinct advantages:

- Reduce installation problems
- Eliminate external seals
- Lower installation costs
- Improve safety
- Mounting lugs and taper tapped hubs with integral bushings
- Large machine screws for fastening covers to bodies
- Lockout hole for padlock having 1/4" hasp is provided
- Close tolerances in machining of wide, mating flanges and journaled shafts and bearings produce flametightness of enclosure joints
- Dead end (EDS) or through feed (EDSC) hubs – 3/4" or 1" sizes

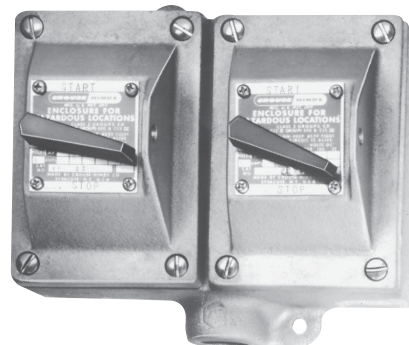
### Certifications and Complies:

- NEC/CEC
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7B\*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

\*Seals must be installed within 1 1/2" of each conduit opening in Division 1.



EDSC2199



EDS2299

### Standard Materials:

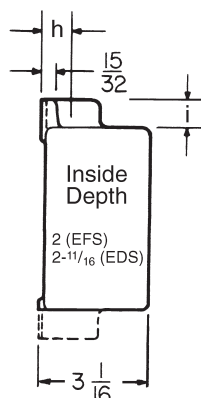
- Bodies – *Feraloy*® iron alloy (U.S.); copper-free aluminum (Canada)
- Shafts & bushings – stainless steel
- Sealing enclosures – copper-free aluminum

### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Type 6 / 6 nylon – black
- Stainless steel – natural

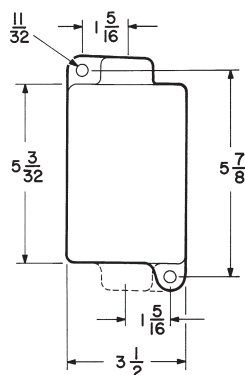
### Dimensions In Inches:

#### Side View

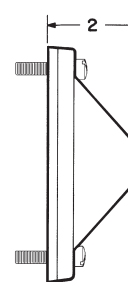
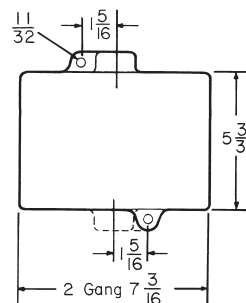


#### Front View

##### Single gang



##### Two gang



Surface covers have same length and width as single & 2 gang bodies.

Dimensions are approximate, not for construction purposes.

### Options:

| Description                                                          | Suffix |
|----------------------------------------------------------------------|--------|
| For use in Group B hazardous areas                                   | GB*    |
| Bodies and covers (single and two gang units) – copper-free aluminum | SA     |

| Hub Size | Dim. "h" | Dim. "i" |
|----------|----------|----------|
| 3/4      | 7/8      | 1 3/16   |
| 1        | 1        | 1 5/16   |

# EDS Series Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

2C

## Ordering Information

### With Allen-Bradley Bulletin 600 Switches

| Maximum HP Ratings |                     |                     |                  |
|--------------------|---------------------|---------------------|------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC | Cat. #           |
| 1                  | 1 hp                |                     | A B BUL 600 TOX4 |
| 2                  | 1 hp                | ¾ hp                | A B BUL 600 TOX5 |

| Poles              | Hub<br>Size in. | Dead end Cat. #          | Through feed Cat. #        |
|--------------------|-----------------|--------------------------|----------------------------|
| <b>Single Gang</b> |                 |                          |                            |
| 1                  | ¾<br>1          | EDS2199 ①<br>EDS3199 ①   | EDSC2199 ①<br>EDSC3199 ①   |
| 2                  | ¾<br>1          | EDS21100 ①<br>EDS31100 ① | EDSC21100 ①<br>EDSC31100 ① |
| <b>Two Gang</b>    |                 |                          |                            |
| 1                  | ¾<br>1          | EDS2299 ①<br>EDS3299 ①   | EDSC2299 ①<br>EDSC3299 ①   |
| 2                  | ¾<br>1          | EDS22100 ①<br>EDS32100 ① | EDSC22100 ①<br>EDSC32100 ① |

### With General Electric Switches

| Maximum HP Ratings |                     |                 |                 |            |
|--------------------|---------------------|-----------------|-----------------|------------|
| Poles              | 115-230<br>Volts AC | 115<br>Volts DC | 230<br>Volts DC | Cat. #     |
| 1                  | 1 hp                | 1 hp            | ¾ hp            | GE CR101 Y |
| 2                  | 1 hp                | 1 hp            | 1 hp            | GE CR101 H |

| Poles              | Hub Size<br>in. | Dead end Cat. #          | Through feed Cat. #        |
|--------------------|-----------------|--------------------------|----------------------------|
| <b>Single Gang</b> |                 |                          |                            |
| 1                  | ¾<br>1          | EDS21093 ①<br>EDS31093 ① | EDSC21093 ①<br>EDSC31093 ① |
| 2                  | ¾<br>1          | EDS21094 ①<br>EDS31094 ① | EDSC21094 ①<br>EDSC31094 ① |
| <b>Two Gang</b>    |                 |                          |                            |
| 1                  | ¾<br>1          | EDS22093 ①<br>EDS32093 ① | EDSC22093 ①<br>EDSC32093 ① |
| 2                  | ¾<br>1          | EDS22094 ①<br>EDS32094 ① | EDSC22094 ①<br>EDSC32094 ① |

### Heater Table (Allen-Bradley)

| Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number | Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number |
|---------------------------------|------------------------------------------|---------------------------------|------------------------------------------|
| 0.17                            | P1                                       | 2.92                            | P22                                      |
| 0.21                            | P2                                       | 3.09                            | P23                                      |
| 0.25                            | P3                                       | 3.32                            | P24                                      |
| 0.32                            | P4                                       | 3.77                            | P25                                      |
| 0.39                            | P5                                       | 4.16                            | P26                                      |
| 0.46                            | P6                                       | 4.51                            | P27                                      |
| 0.57                            | P7                                       | 4.93                            | P28                                      |
| 0.71                            | P8                                       | 5.43                            | P29                                      |
| 0.79                            | P9                                       | 6.03                            | P30                                      |
| 0.87                            | P10                                      | 6.83                            | P31                                      |
| 0.98                            | P11                                      | 7.72                            | P32                                      |
| 1.08                            | P12                                      | 8.24                            | P33                                      |
| 1.19                            | P13                                      | 8.9                             | P34                                      |
| 1.30                            | P14                                      | 9.6                             | P35                                      |
| 1.43                            | P15                                      | 10.8                            | P36                                      |
| 1.58                            | P16                                      | 12.0                            | P37                                      |
| 1.75                            | P17                                      | 13.5                            | P38                                      |
| 1.88                            | P18                                      | 15.2                            | P39                                      |
| 2.13                            | P19                                      |                                 |                                          |
| 2.40                            | P20                                      |                                 |                                          |
| 2.58                            | P21                                      |                                 |                                          |

① Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted.

\*Add GB suffix. Seals must be installed within 1½" of each conduit opening for Group B usage.

### Heater Table (General Electric)

| Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number | Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number |
|---------------------------------|------------------------------------------|---------------------------------|------------------------------------------|
| .48                             | G2                                       | 3.01                            | G22                                      |
| .53                             | G3                                       | 3.27                            | G23                                      |
| .58                             | G4                                       | 3.56                            | G24                                      |
| .65                             | G5                                       | 3.88                            | G25                                      |
| .71                             | G6                                       | 4.22                            | G26                                      |
| .78                             | G7                                       | 4.60                            | G27                                      |
| .86                             | G8                                       | 5.00                            | G28                                      |
| .95                             | G9                                       | 5.43                            | G29                                      |
| 1.04                            | G10                                      | 5.90                            | G30                                      |
| 1.14                            | G11                                      | 6.41                            | G31                                      |
| 1.25                            | G12                                      | 6.98                            | G32                                      |
| 1.37                            | G13                                      | 7.60                            | G33                                      |
| 1.49                            | G14                                      | 8.25                            | G34                                      |
| 1.63                            | G15                                      | 8.95                            | G35                                      |
| 1.78                            | G16                                      | 9.75                            | G36                                      |
| 1.95                            | G17                                      | 10.6                            | G37                                      |
| 2.13                            | G18                                      | 11.4                            | G38                                      |
| 2.32                            | G19                                      | 12.5                            | G39                                      |
| 2.53                            | G20                                      | 13.6                            | G40                                      |
| 2.76                            | G21                                      | 14.8                            | G41                                      |
|                                 |                                          | 16.0                            | G42                                      |

## Crouse-Hinds

by **E.T.N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business



# 2C

## EDS Series Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

### With Cutler-Hammer Switches

#### Maximum HP Ratings

| Poles | 120-240<br>Volts AC | 32<br>Volts DC | 120<br>Volts DC | 240<br>Volts DC | Cat. #            |
|-------|---------------------|----------------|-----------------|-----------------|-------------------|
| 1     | 1 hp                | ¼ hp           | ¼ hp            | ¼ hp            | <b>WEST MST01</b> |
| 2     | 1 hp                | ¼ hp           | 1 hp            | ¾ hp            | <b>WEST MST02</b> |

| Poles              | Hub Size in. | Dead end Cat. #                        | Through feed Cat. #                      |
|--------------------|--------------|----------------------------------------|------------------------------------------|
| <b>Single Gang</b> |              |                                        |                                          |
| 1                  | ¾<br>1       | <b>EDS21101</b> ①<br><b>EDS31101</b> ① | <b>EDSC21101</b> ①<br><b>EDSC31101</b> ① |
| 2                  | ¾<br>1       | <b>EDS21102</b> ①<br><b>EDS31102</b> ① | <b>EDSC21102</b> ①<br><b>EDSC31102</b> ① |
| <b>Two Gang</b>    |              |                                        |                                          |
| 1                  | ¾<br>1       | <b>EDS22101</b> ①<br><b>EDS32101</b> ① | <b>EDSC22101</b> ①<br><b>EDSC32101</b> ① |
| 2                  | ¾<br>1       | <b>EDS22102</b> ①<br><b>EDS32102</b> ① | <b>EDSC22102</b> ①<br><b>EDSC32102</b> ① |

### Heater Table (Cutler-Hammer)

| Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number | Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number |
|---------------------------|------------------------------------|---------------------------|------------------------------------|
| .43                       | W 1                                | 2.95                      | W21                                |
| .48                       | W 2                                | 3.27                      | W22                                |
| .53                       | W 3                                | 3.59                      | W23                                |
| .58                       | W 4                                | 3.99                      | W24                                |
| .64                       | W 5                                | 4.39                      | W25                                |
| .71                       | W 6                                | 4.79                      | W26                                |
| .78                       | W 7                                | 5.26                      | W27                                |
| .87                       | W 8                                | 5.83                      | W28                                |
| .95                       | W 9                                | 6.39                      | W29                                |
| 1.03                      | W10                                | 7.03                      | W30                                |
| 1.15                      | W11                                | 7.74                      | W31                                |
| 1.27                      | W12                                | 8.46                      | W32                                |
| 1.35                      | W13                                | 9.35                      | W33                                |
| 1.51                      | W14                                | 10.30                     | W34                                |
| 1.67                      | W15                                | 11.35                     | W35                                |
| 1.83                      | W16                                | 12.47                     | W36                                |
| 1.99                      | W17                                | 13.67                     | W37                                |
| 2.23                      | W18                                | 15.12                     | W38                                |
| 2.47                      | W19                                | 16.00                     | W39                                |
| 2.71                      | W20                                |                           |                                    |

① Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted.

\*Add GB suffix. Seals must be installed within 1½" of each conduit opening for Group B usage.

# GHG 635 Series Explosion Protected Manual Motor Starters 25 Amp, 690 VAC Non-metallic Enclosure

UL/cUL Listed  
Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zones 1 and 2, AEx de  
IIB + H<sub>2</sub>, T5, T6  
Cl. II, Div. 1, Groups E, F, G (cUL)

CENELEC - PTB 99  
ATEX 1162 Certified  
Ex de IIC, T6, Zones 1 and 2  
Ex de IIC, T6 Zones 21 and 22  
IP66, NEMA 4X

2C

## Applications:

- Explosion protected manual motor starters are used in a metallic conduit or cable system for surface mounting to protect motors against overload and phase failure.

## Features:

- Explosion protected factory sealed circuit breaker and manual motor starter
- Innovative break-line in cover allows full wiring access, making installation quick and easy
- Switch handle provides clear indication of switch position
- Lockable handle meets OSHA lockout/tagout requirements, provision for 3 padlocks
- Large rotary handle provides easy gripping with gloved hands
- Captive cover screws

## Certifications and Complies:

- UL/cUL Listed
- Class I, Division 2, Groups A, B, C, D
- Class I, Zones 1 and 2, Ex de IIB+H<sub>2</sub>, T6
- Class II, Division 1, Groups E, F, G (cUL)
- CENELEC - PTB 99-ATEX 1162
- Ex de IIC, T6, Zones 1 and 2
- IP66, NEMA 4X

## Standard Materials:

- Enclosure - Fiberglass-reinforced polyester  
Nonmetallic, corrosion resistant  
Increased safety Ex-e protection  
Impact Resistant  
NEMA 4X, IP66 Protection  
Enclosure meets UL 94-VO  
UV rated
- Enclosure Gasket - Silicon
- Handle - Impact-resistant thermoplastic
- Cover Screws - Stainless steel
- Conduit Entries - Zinc Myers Hubs
- Brass Mounting plate - Ground continuity



## Technical Data

### Type of Protection

### Rated Voltage

### Rated Current

### Rated Current, Aux. Contact

### Short Circuit

### Under Voltage Trip

### Connection Terminals

### Connection Terminals, Aux. Contact

### Conduit or Cable Entries

### Weight

(A)Ex ed IIC T5, T6

Up to 690 VAC

Up to 25 A

2 A

See table on next page

Tripping at 15% – 75% V-rated  
Switching - on when V> 80% V-rated

Up to 10mm<sup>2</sup>

2 x 2.5 mm<sup>2</sup>

2 x 3/4" Myers hubs

5.5 lbs./2.5 Kg.

2C



## 20

CENELEC - PTB 99  
ATEX 1162 Certified  
Ex de IIC, T6, Zones 1 and 2  
Ex de IIC, T6 Zones 21 and 22  
IP66, NEMA 4X

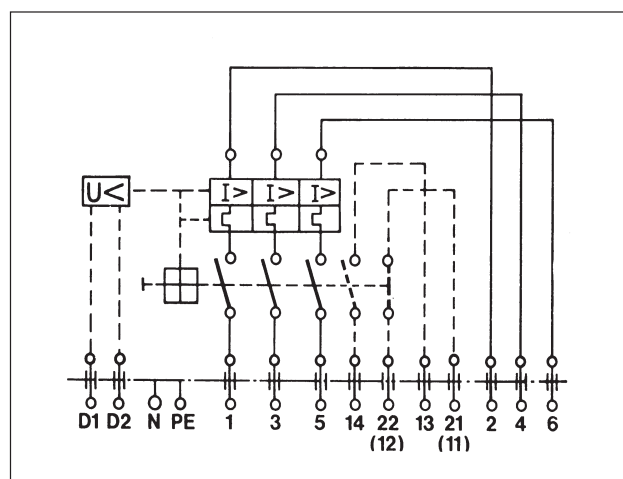
| Setting Range   | 400 VAC AIC | 500 VAC AIC | 690 VAC AIC |
|-----------------|-------------|-------------|-------------|
| 0.1 A – 1.6 A   | N/A*        | N/A*        | N/A*        |
| 1.6 A – 2.5 A   | N/A*        | N/A*        | 40          |
| 2.5 A – 4.0 A   | N/A*        | 60          | 10          |
| 4.0 A – 6.3 A   | N/A*        | 40          | 7           |
| 6.3 A – 9.0 A   | N/A*        | 30          | 5           |
| 9.0 A – 12.5 A  | 75          | 27          | 4.5         |
| 12.5 A – 16.0 A | 60          | 25          | 4           |
| 16.0 A – 20.0 A | 55          | 22          | 3.5         |
| 20.0 A – 25.0 A | 50          | 20          | 3           |

## Ordering Information

2C

1 = without aux. contact  
2 = with aux. contact 1 NO + 1NC  
3 = with aux. contact 2 NO

## Wiring Diagram

[illegible]

# MC Series Manual Motor Starting Switches and Enclosures

NEMA 3, 4, 12  
Raintight  
Wet Locations

2C

## Applications:

- MC manual motor starting switches and enclosures are used:
- For manual starting of small AC and DC motors of one horsepower or less (see next page for ratings)
  - In damp, wet or corrosive locations such as dairies, meat packing plants, chemical plants and outdoor locations
  - To provide motor running protection and manual starting and stopping

## Features:

- Enclosure is compact and gasketed to meet NEMA/EEMAC 4 requirements for watertightness
- Switch can be padlocked in either the "ON" or "OFF" positions
- Provided with dead end (MC) or throughfeed (MCC) hubs – 1/2" and 3/4" sizes – with mounting feet

## Certifications and Compliances:

- NEMA/EEMAC: 3, 4, 12
- UL Standard: 508
- CSA Standard: C22.2 No. 14

## Standard Materials:

- Body and cover – *Feraloy*® iron alloy
- Operating handle – copper-free aluminum
- Operating shaft – stainless steel

## Standard Finishes:

- Feraloy* – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

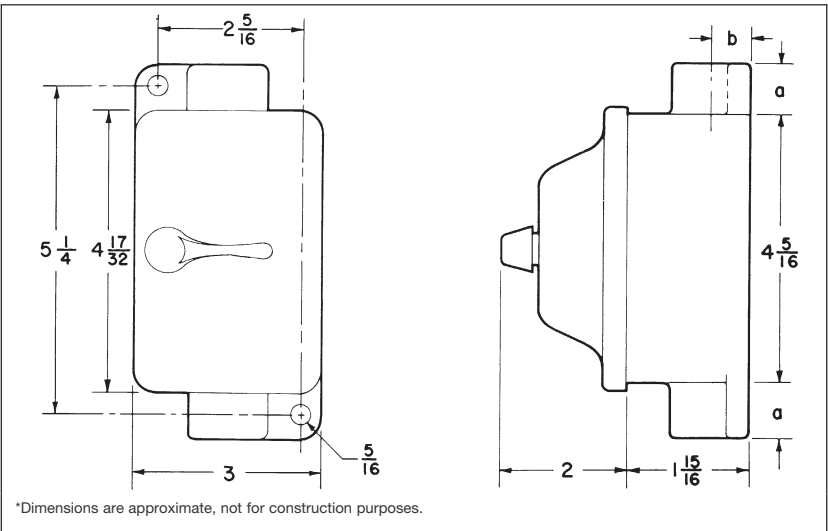


MC dead end



MCC through feed

## Dimensions In Inches\*:



| Hub Size | 1/2 | 3/4 |
|----------|-----|-----|
| a        | 7/8 | 7/8 |
| b        | 5/8 | 3/4 |

## MC Manual Motor Starting Switches

| Manufacturer  | Poles | Cat. # |
|---------------|-------|--------|
| Cutler-Hammer | 1     | MST01  |
| Cutler-Hammer | 2     | MST02  |

## Maximum Horsepower Ratings

| Volts        | 1-Pole | 2-Pole |
|--------------|--------|--------|
| 120 / 240 AC | 1      | 1      |
| 32 DC        | 1/4    | 1/4    |
| 120 / 240 DC |        | 1      |
| 240 DC       | 1/4    |        |

## Ordering Information - MC Single Gang (Dead End)

| Poles | Hub Size in. | Enclosure With Switch<br>Cat. # | Without Switch<br>Cat. # |
|-------|--------------|---------------------------------|--------------------------|
| 1     | 1/2          | MC1211 ①                        | MC1212B                  |
| 1     | 3/4          | MC2211 ①                        | MC2212B                  |
| 2     | 1/2          | MC1212 ①                        | MC1212B                  |
| 2     | 3/4          | MC2212 ①                        | MC2212B                  |

## Ordering Information - MCC Single Gang (Through Feed)

| Poles | Hub Size in. | Enclosure With Switch<br>Cat. # | Without Switch<br>Cat. # |
|-------|--------------|---------------------------------|--------------------------|
| 1     | 1/2          | MCC1211 ①                       | MCC1212B                 |
| 1     | 3/4          | MCC2211 ①                       | MCC2212B                 |
| 2     | 1/2          | MCC1212 ①                       | MCC1212B                 |
| 2     | 3/4          | MCC2212 ①                       | MCC2212B                 |

## Heater Table

| Full Load Motor Current | Heater Rating | Eaton's Crouse-Hinds Symbol Number |
|-------------------------|---------------|------------------------------------|
| .40 – .43               | .50           | W1                                 |
| .44 – .48               | .55           | W2                                 |
| .49 – .53               | .61           | W3                                 |
| .54 – .58               | .67           | W4                                 |
| .59 – .64               | .74           | W5                                 |
| .65 – .71               | .81           | W6                                 |
| .72 – .78               | .89           | W7                                 |
| .79 – .87               | .98           | W8                                 |
| .88 – .95               | 1.10          | W9                                 |
| .96 – 1.03              | 1.20          | W10                                |
| 1.04 – 1.15             | 1.30          | W11                                |
| 1.16 – 1.27             | 1.45          | W12                                |
| 1.28 – 1.35             | 1.60          | W13                                |
| 1.36 – 1.51             | 1.70          | W14                                |
| 1.52 – 1.67             | 1.90          | W15                                |
| 1.68 – 1.83             | 2.10          | W16                                |
| 1.84 – 1.99             | 2.30          | W17                                |
| 2.00 – 2.23             | 2.50          | W18                                |
| 2.24 – 2.47             | 2.80          | W19                                |
| 2.48 – 2.71             | 3.10          | W20                                |
| 2.72 – 2.95             | 3.40          | W21                                |
| 2.96 – 3.27             | 3.70          | W22                                |
| 3.28 – 3.59             | 4.10          | W23                                |
| 3.60 – 3.99             | 4.50          | W24                                |
| 4.00 – 4.39             | 5.00          | W25                                |
| 4.40 – 4.79             | 5.50          | W26                                |
| 4.80 – 5.26             | 6.00          | W27                                |
| 5.27 – 5.83             | 6.60          | W28                                |
| 5.84 – 6.39             | 7.30          | W29                                |
| 6.40 – 7.03             | 8.00          | W30                                |
| 7.04 – 7.74             | 8.80          | W31                                |
| 7.75 – 8.46             | 9.70          | W32                                |
| 8.47 – 9.35             | 10.60         | W33                                |
| 9.36 – 10.30            | 11.70         | W34                                |
| 10.31 – 11.35           | 12.90         | W35                                |
| 11.36 – 12.47           | 14.20         | W36                                |
| 12.48 – 13.67           | 15.60         | W37                                |
| 13.68 – 15.12           | 17.10         | W38                                |
| 15.13 – 16.00           | 18.60         | W39                                |

① Includes one interchangeable heater. Select heater from table above and use symbol number as second section of the Cat. No. Example: MC1211-W5. Symbol 0 (zero) may be used to indicate heater omitted.

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters.

# NSSC Series Manual Motor Starting Switches and NFS Series Fractional HP Starters and Enclosures

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

2C

## Applications:

- Motor Starting Switches are used in manual "ON" and "OFF" control of DC and single-phase or three-phase AC motors where overload protection is not required or is provided separately
- NFSC Fractional Horsepower Starters are used in manual "ON" and "OFF" control and overload protection of small single phase motors
- Both are suitable for use in wet and/or corrosive environments

## Features:

- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat
- Provided with a toggle lever with a molded-in stainless steel shaft
- Factory installed through feed (NSSC, NFSC) hubs, 1/2" or 3/4" size
- Indicating plate is made of stainless steel

## Certifications and Compliances:

- NEMA 3, 4X, and 12

## Options:

- Grounding plate or bushing – see page 677



## Ordering Information

### NSSC Series Manual Motor Starting Switch Without Overload Protection With Square D Switches

| Poles | Max. HP Rating |             |             | Max. Amp. Ratings |         |
|-------|----------------|-------------|-------------|-------------------|---------|
|       | 115 VAC        | 200–230 VAC | 460–575 VAC | 250 VDC           | 600 VDC |
| 2     | 1              | 2           | 3           | 30                | 20      |
| 3     | 2              | 7½          | 10          | 30                | 20      |

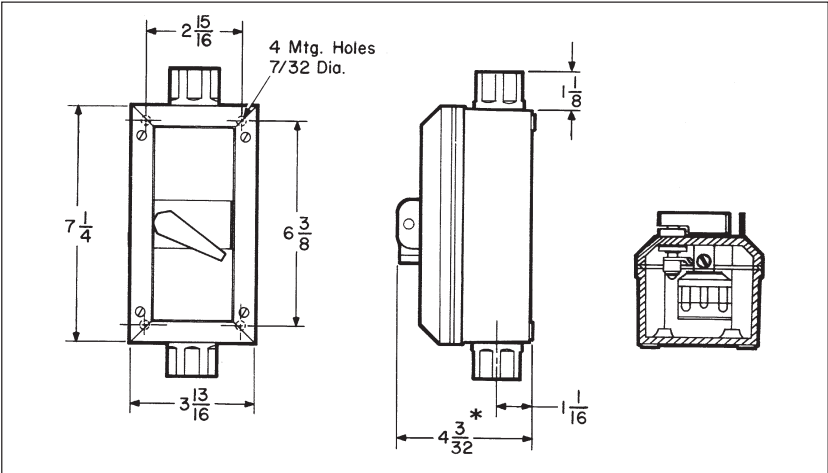
| Poles | Enclosure With Switch |                     |
|-------|-----------------------|---------------------|
|       | Hub Size              | Through Feed Cat. # |
| 2     | ½                     | NSSC D12            |
|       | ¾                     | NSSC D22            |
| 3     | ½                     | NSSC D13            |
|       | ¾                     | NSSC D23            |

### Enclosures Only

| Enclosure Type               | Hub Size | Through Feed Cat. # |
|------------------------------|----------|---------------------|
| Manual Motor Starting Switch | ½        | NSSC1               |
|                              | ¾        | NSSC2               |
| Fractional HP Starter        | ½        | NFSC1               |
|                              | ¾        | NFSC2               |

## Dimensions\*

In Inches:



\*Dimensions are approximate. Not to be used for construction purposes unless approved.

# NSSC Series Manual Motor Starting Switches and NFS Series Fractional HP Starters and Enclosures

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Ordering Information

### NFSC Series Fractional HP Starters With Overload Protection

#### With Allen-Bradley Bulletin 600 Switches

| Maximum HP Ratings |                     |                     |
|--------------------|---------------------|---------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC |
| 1                  | 1 hp                |                     |
| 2                  | 1 hp                | ¾ hp                |

| Enclosure With Starter |          |                            |
|------------------------|----------|----------------------------|
| Poles                  | Hub Size | Through Feed Cat. #        |
| 1                      | ½<br>¾   | NFSC AB11 ①<br>NFSC AB21 ① |
| 2                      | ½<br>¾   | NFSC AB12 ①<br>NFSC AB22 ① |

Heater Table (see pages 479-480)

#### With Cutler-Hammer Switches

| Maximum HP Ratings |                     |                     |
|--------------------|---------------------|---------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC |
| 1                  | 1 hp                |                     |
| 2                  | 1 hp                | 1 hp                |

| Enclosure With Starter |          |                          |
|------------------------|----------|--------------------------|
| Poles                  | Hub Size | Through Feed Cat. #      |
| 1                      | ½<br>¾   | NFSC C11 ①<br>NFSC C21 ① |
| 2                      | ½<br>¾   | NFSC C12 ①<br>NFSC C22 ① |

#### Heater Table (Cutler-Hammer)

| Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number | Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number |
|---------------------------|------------------------------------|---------------------------|------------------------------------|
| .43                       | W 1                                | 2.95                      | W21                                |
| .48                       | W 2                                | 3.27                      | W22                                |
| .53                       | W 3                                | 3.59                      | W23                                |
| .58                       | W 4                                | 3.99                      | W24                                |
| .64                       | W 5                                | 4.39                      | W25                                |
| .71                       | W 6                                | 4.79                      | W26                                |
| .78                       | W 7                                | 5.26                      | W27                                |
| .87                       | W 8                                | 5.83                      | W28                                |
| .95                       | W 9                                | 6.39                      | W29                                |
| 1.03                      | W10                                | 7.03                      | W30                                |
| 1.15                      | W11                                | 7.74                      | W31                                |
| 1.27                      | W12                                | 8.46                      | W32                                |
| 1.35                      | W13                                | 9.35                      | W33                                |
| 1.51                      | W14                                | 10.30                     | W34                                |
| 1.67                      | W15                                | 11.35                     | W35                                |
| 1.83                      | W16                                | 12.47                     | W36                                |
| 1.99                      | W17                                | 13.67                     | W37                                |
| 2.23                      | W18                                | 15.12                     | W38                                |
| 2.47                      | W19                                | 16.00                     | W39                                |
| 2.71                      | W20                                |                           |                                    |

#### With General Electric Switches

| Maximum HP Ratings |                |           |            |            |
|--------------------|----------------|-----------|------------|------------|
| Poles              | 115-230<br>VAC | 32<br>VDC | 115<br>VDC | 230<br>VDC |
| 1                  | 1 hp           | ¼ hp      | 1 hp       | ¼ hp       |
| 2                  | 1 hp           | ¼ hp      | 1 hp       | 1 hp       |

| Enclosure With Starter |          |                          |
|------------------------|----------|--------------------------|
| Poles                  | Hub Size | Through Feed Cat. #      |
| 1                      | ½<br>¾   | NFSC G11 ①<br>NFSC G21 ① |
| 2                      | ½<br>¾   | NFSC G12 ①<br>NFSC G22 ① |

Heater Table (see pages 479-480)

#### With Square D Switches

| Maximum HP Ratings |                     |                     |
|--------------------|---------------------|---------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC |
| 1                  | 1 hp                |                     |
| 2                  | 1 hp                | ¾ hp                |

| Enclosure With Starter |          |                          |
|------------------------|----------|--------------------------|
| Poles                  | Hub Size | Through Feed Cat. #      |
| 1                      | ½<br>¾   | NFSC D11 ①<br>NFSC D21 ① |
| 2                      | ½<br>¾   | NFSC D12 ①<br>NFSC D22 ① |

#### Heater Table (Square D)

| Full-Load Motor Current | Eaton's Crouse-Hinds Symbol Number | Full-Load Motor Current | Eaton's Crouse-Hinds Symbol Number |
|-------------------------|------------------------------------|-------------------------|------------------------------------|
| 0.41-0.44               | A.49                               | 2.85-3.06               | A3.95                              |
| 0.45-0.49               | A.54                               | 3.07-3.45               | A4.32                              |
| 0.50-0.53               | A.59                               | 3.46-3.70               | A4.79                              |
| 0.54-0.58               | A.65                               | 3.71-4.07               | A5.30                              |
| 0.59-0.65               | A.71                               | 4.08-4.32               | A5.78                              |
| 0.66-0.71               | A.78                               | 4.33-4.90               | A6.20                              |
| 0.72-0.78               | A.86                               | 4.91-5.35               | A6.99                              |
| 0.79-0.85               | A.95                               | 5.36-5.85               | A7.65                              |
| 0.86-0.96               | A1.02                              | 5.86-6.41               | A8.38                              |
| 0.97-1.04               | A1.16                              | 6.42-6.79               | A9.25                              |
| 1.05-1.16               | A1.25                              | 6.80-7.57               | A9.85                              |
| 1.17-1.29               | A1.39                              | 7.58-8.15               | A11.0                              |
| 1.30-1.37               | A1.54                              | 8.16-8.98               | A11.9                              |
| 1.38-1.47               | A1.63                              | 8.99-9.67               | A13.2                              |
| 1.48-1.56               | A1.75                              | 9.68-9.95               | A14.1                              |
| 1.57-1.65               | A1.86                              | 9.96-10.8               | A14.8                              |
| 1.66-1.79               | A1.99                              | 10.9-12.1               | A16.2                              |
| 1.80-1.95               | A2.15                              | 12.2-13.1               | A17.9                              |
| 1.96-2.15               | A2.31                              | 13.2-13.9               | A19.8                              |
| 2.16-2.38               | A2.57                              | 14.0-15.0               | A21.3                              |
| 2.39-2.75               | A2.81                              | 15.1-16.0               | A25.2                              |
| 2.76-2.84               | A3.61                              |                         |                                    |

① Includes one interchangeable heater. Select heater suffix from table and add to catalog number. Example: NFSC-D11A.49

# NMN Series Manual Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

2C

## Applications:

- NMN manual line starters are for use in across-the-line starting of motors, motor protection and manual starting and stopping.

## Features:

- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat.
- Factory installed dead end (NMN) or through feed (NMNC) hubs, 3/4" and 1" sizes.

## Certifications and Compliances:

- NEMA/EEMAC 3, 4X and 12

## Electrical Rating Ranges:

- Starter sizes 0, 1, 1P

## Options:

- | Description                                                                                        | Suffix |
|----------------------------------------------------------------------------------------------------|--------|
| Undervoltage protection. Available with toggle operator only .....                                 | U      |
| Grounding plate – see page 677.                                                                    |        |
| Insulated, groundable type terminal block for grounded or ungrounded neutral can be supplied ..... | S618   |



Toggle-operated manual starter with knockout

2C

## Ordering Information

### Starter

| NEMA Size | Poles    | Max. HP | 115V  | 230V | 460/575V |
|-----------|----------|---------|-------|------|----------|
| M-0       | 2 (1 PH) | 1       | 2     |      |          |
| M-1       | 2 (1 PH) | 2       | 3     |      |          |
| M-1P      | 2 (1 PH) | 3       | 5     |      |          |
| M-0       | 3 (3 PH) | 2       | 3     | 5    |          |
| M-1       | 3 (1 PH) | 2       | 3     |      |          |
|           | 3 (3 PH) | 3       | 7 1/2 | 10   |          |

### Enclosure with Starter 3/4" Hubs

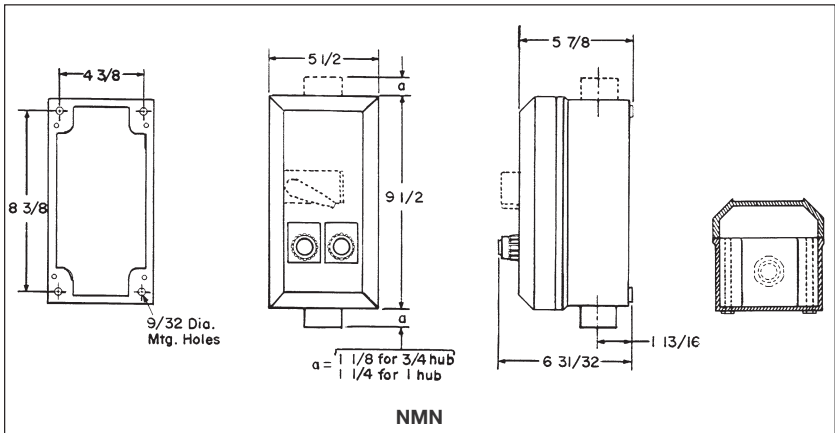
| Dead End Cat #  | Through Feed Cat # | Dead End Cat # | Through Feed Cat # |
|-----------------|--------------------|----------------|--------------------|
| NMN ①220        | NMNC ①220          | NMN ①320       | NMNC ①320          |
| NMN ①221        | NMNC ①221          | NMN ①321       | NMNC ①321          |
| NMN ①221P       | NMNC ①221P         | NMN ①321P      | NMNC ①321P         |
| NMN ①230        | NMNC ①230          | NMN ①330       | NMNC ①330          |
| NMN ①231        | NMNC ①231          | NMN ①331       | NMNC ①300          |
| Enclosure Only* |                    |                |                    |
| NMN ①200        | NMNC ①200          | NMN ①300       | NMNC ①300          |

①Motor Starters: Insert appropriate symbol in Cat. No.

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |

## Dimensions

### In Inches:



\*Furnished with mounting plate and operator installed.

## Crouse-Hinds

by E.T.N

# NMG Series Magnetic Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Applications:

NMG magnetic line starters are used:

- For magnetic across-the-line starting of motors and remote starting and stopping
- For across-the-line starting of polyphase AC induction motors
- To provide motor running protection, undervoltage protection and remote starting and stopping

## Features:

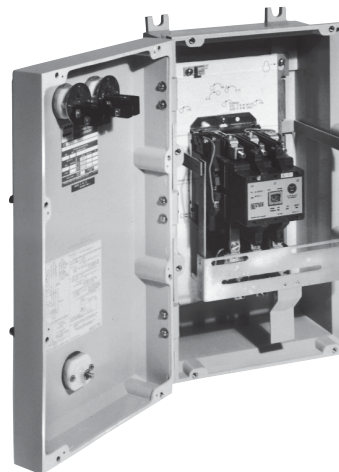
- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat.
- Unitized, strong and durable enclosure construction provides longer service life for equipment.
- Exterior parts of RESET button made of *Krydon* material.

## Certifications and Compliances:

- NEMA/EEMAC: 3, 4X and 12

## Electrical Rating Ranges:

- Starter sizes 0, 1, 2, 3, 4



Magnetic line starter with optional hinged cover with START-STOP pushbuttons.

## Options:

| Description                                                                                                                      | Suffix |
|----------------------------------------------------------------------------------------------------------------------------------|--------|
| Hinged cover.....                                                                                                                | NH     |
| Pilot lights, 120 V primary – specify other primary voltages as required:                                                        |        |
| Red pilot light.....                                                                                                             | J1*    |
| Green pilot light.....                                                                                                           | J3*    |
| LED pilot lights in place of standard incandescent pilot lamps.....                                                              | LED    |
| Pushbutton (heavy duty, uses two device holes):                                                                                  |        |
| START-STOP.....                                                                                                                  | PB13*  |
| Selector switches (heavy duty):                                                                                                  |        |
| ON-OFF.....                                                                                                                      | RR17*  |
| HAND-OFF-AUTO.....                                                                                                               | RR18*  |
| JOG-RUN-OFF.....                                                                                                                 | RR19*  |
| Padlock attachment for:                                                                                                          |        |
| Pushbutton.....                                                                                                                  | S708   |
| Control circuit transformer 480 / 240-120 volts, 50 or 60 hertz, (sizes 0 and 1-50VA, size 2-100VA, size 3-150VA, size 4-300VA): |        |
| Fusible                                                                                                                          |        |
| Secondary.....                                                                                                                   | FT     |
| Primary and Secondary.....                                                                                                       | FTPS   |
| Automatic reset overload relay.....                                                                                              | S1     |
| Less overload relays (contactor).....                                                                                            | C      |
| Auxiliary Contact on Starter or Contactor:                                                                                       |        |
| 1NO/1NC.....                                                                                                                     | S781   |
| 2NO/2NC.....                                                                                                                     | S782   |
| 3NO/3NC.....                                                                                                                     | S783   |

| Description                                                                                                                                                 | Suffix |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Time delay low voltage release for 3-wire control with 2, 4 or 6-second adjustment. For single-speed, non-reversing starters only. Control circuit voltage: |        |
| 120 volt, 60 hertz.....                                                                                                                                     | LVR1   |
| 240 volt, 60 hertz.....                                                                                                                                     | LVR2   |
| 480 volt, 60 hertz.....                                                                                                                                     | LVR3   |
| Hubs (see "Note on Hubs") – see page 677                                                                                                                    |        |
| Grounding plate or bushing† – see page 677                                                                                                                  |        |
| Insulated, groundable type terminal block for a grounded or ungrounded neutral can be supplied.....                                                         | S618   |
| Information on other options or combination of options for a specific enclosure size is available on request.                                               |        |

†Type GP grounding plate only in NMG0710 enclosure.

\*For optional devices or control circuit transformer, use next larger enclosure size. For NMG0714, two device holes maximum.



# NMG Series Magnetic Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

2C

## Ordering Information

To order an enclosure complete with starter, insert the manufacturer's symbol in the designated position of the catalog number. Symbols are shown in the footnote at the bottom of this page. Specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Starters are furnished with three heaters. Enclosures only can be ordered. Select from listings.

| Single-Speed, Non-Reversing Motor Starter |            |           | Enclosure           |                        |
|-------------------------------------------|------------|-----------|---------------------|------------------------|
| Max. HP Polyphase                         | Volts (AC) | NEMA Size | With Starter Cat. # | Without Starter Cat. # |
| 2                                         | 120        | 0         | NMG0710 ①6130       | NMG0710                |
| 3                                         | 120        | 1         | NMG0710 ①6131       | NMG0710                |
| 3                                         | 240        | 0         | NMG0710 ①6230       | NMG0710                |
| 5                                         | 480        | 0         | NMG0710 ①6430       | NMG0710                |
| 5                                         | 600        | 0         | NMG0710 ①6530       | NMG0710                |
| 7½                                        | 120        | 2         | NMG0714 ①6132       | NMG0714                |
| 7½                                        | 240        | 1         | NMG0710 ①6231       | NMG0710                |
| 10                                        | 480        | 1         | NMG0710 ①6431       | NMG0710                |
| 10                                        | 600        | 1         | NMG0710 ①6531       | NMG0710                |
| 15                                        | 120        | 3         | NMG1018 ①6133       | NMG1018                |
| 15                                        | 240        | 2         | NMG0714 ①6232       | NMG0714                |
| 25                                        | 480        | 2         | NMG0714 ①6432       | NMG0714                |
| 25                                        | 600        | 2         | NMG0714 ①6532       | NMG0714                |
| 30                                        | 240        | 3         | NMG1018 ①6233       | NMG1018                |
| 50                                        | 240        | 4         | NMG1024 ①6234*      | NMG1024                |
| 50                                        | 480        | 3         | NMG1018 ①6433       | NMG1018                |
| 50                                        | 600        | 3         | NMG1018 ①6533       | NMG1018                |
| 100                                       | 480        | 4         | NMG1024 ①6434*      | NMG1024                |
| 100                                       | 600        | 4         | NMG1024 ①6534*      | NMG1024                |

\*NEMA Size 4 Allen-Bradley starter must be in NMG1426 enclosure.

① Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| Cutler-Hammer    | C      |
| General Electric | G      |
| Westinghouse     | W      |

Information on other starter manufacturers on request.

## Ordering Information when adding options

When adding options to NMG series enclosures, the base catalog number must be changed according to the table below.

| NEMA Size | Enclosure Cat. # | Enclosure w/Options |
|-----------|------------------|---------------------|
| 0, 1      | NMG0710          | NMG0714             |
| 2         | NMG0714          | NMG1018             |
| 3         | NMG1018          | NMG1024             |
| 4         | NMG1024          | NMG1426             |

**Example:** A NEMA size 4, 480 V Westinghouse starter with START-STOP pushbuttons would be Cat. No. NMG1426-W6434-PB13.

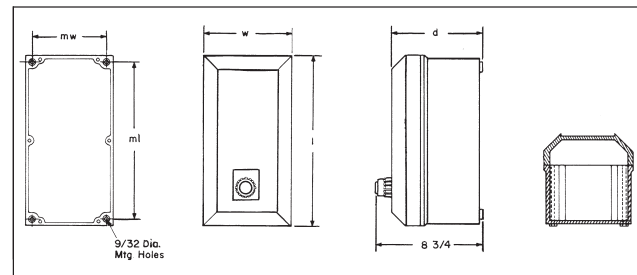
**Note on Hubs:** The following number and sizes of hubs (not mounted) are included when magnetic starters are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Starter Size | Number Included | Hub Size |
|--------------|-----------------|----------|
| 0            | 3               | ¾        |
| 1            | 1               | ¾        |
|              | 2               | 1        |
| 2            | 1               | ¾        |
|              | 2               | 1½       |
| 3            | 1               | ¾        |
|              | 2               | 2        |
| 4            | 1               | ¾        |
|              | 2               | 2½       |

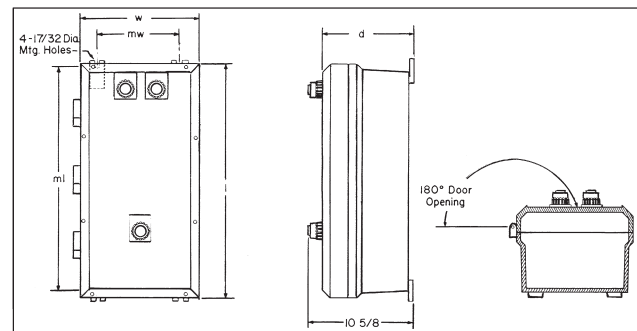
## Crouse-Hinds

by **E•T•N**

## Dimensions† In Inches:



NMG0710 & 0714



NMG1018 & 1024

| Enclosure Cat. # | Outside Dimensions |        |       | Mounting Dimensions |    |
|------------------|--------------------|--------|-------|---------------------|----|
|                  | l                  | w      | d     | ml                  | mw |
| NMG0710          | 10½                | 7½     | 7     | 9⅞                  | 6⅞ |
| NMG0714          | 14½                | 7½     | 7     | 13⅜                 | 6⅞ |
| NMG1018          | 19⅓/₃₂             | 11⅓/₃₂ | 8⅓/₃₂ | 19⅞                 | 7⅞ |
| NMG1024          | 25⅓/₃₂             | 11⅓/₃₂ | 8⅓/₃₂ | 25⅞                 | 7⅞ |

†Not to be used for construction purposes unless approved.

2C



| Description                                               | Page No.          |
|-----------------------------------------------------------|-------------------|
| <b>Application/Selection</b>                              | see page 492      |
| <b>Auxiliary Circuit Breakers &amp; Enclosures</b>        |                   |
| EFD, EFDC Series                                          | see page 507      |
| <b>Thermal Magnetic Circuit Breakers &amp; Enclosures</b> |                   |
| <b>General Information and Dimensions</b>                 |                   |
| EPC Series                                                | see pages 498–499 |
| FLB Series                                                | see page 502      |
| EBMB Series                                               | see pages 494–497 |
| <b>Non-Interchangeable Trip</b>                           |                   |
| <b>100 / 150 ampere frame</b>                             |                   |
| EPC Series                                                | see page 500      |
| FLB Series                                                | see page 503      |
| EBMB Series                                               | see pages 494–495 |
| EIB Series                                                | see page 493      |
| NCB Series                                                | see page 508      |
| <b>225 / 250 ampere frame</b>                             |                   |
| FLB Series                                                | see page 506      |
| EBMB Series                                               | see pages 494–495 |
| NCB Series                                                | see page 508      |
| <b>400 ampere frame</b>                                   |                   |
| EBMB Series                                               | see pages 494–495 |
| <b>Interchangeable Trip</b>                               |                   |
| <b>225 / 250 ampere frame</b>                             |                   |
| FLB Series                                                | see page 506      |
| EBMB Series                                               | see pages 494–495 |
| <b>400 ampere frame</b>                                   |                   |
| EBMB Series                                               | see pages 494–495 |
| NCB Series                                                | see page 508      |
| <b>600 / 800 ampere frame</b>                             |                   |
| EBMB Series                                               | see pages 494–495 |
| <b>1000 ampere frame</b>                                  |                   |
| EBMB Series                                               | see pages 494–495 |

# 3C Circuit Breakers

## Application and Selection Quick Selector Chart

### Applications:

Circuit breakers and their appropriate enclosures are used:

- In conjunction with service entrance, lighting, heating, appliance and motor protection circuits
- To provide disconnect means
- For short circuit protection and thermal time delay overload protection
- In various types of damp, wet, corrosive and hazardous areas

### Considerations for Selection:

Considerations for selection of proper enclosure:

- The environment of the enclosure location in terms of NEC/CEC compliance and NEMA/EEMAC type required
- The size and type of circuit breaker required for the particular application
- See "Quick Selector" below for guidance

### Options:

Many options are available on:

- Material and finishes where special atmospheric conditions prevail
- Special features for specific applications. See individual listings for available options

### Quick Selector Chart

| Enclosures for Circuit Breakers |                                                                                                               |                        |                  |                     |                                  |                                                                                                                        |              |                        |                                |
|---------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------|------------------|---------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------|------------------------|--------------------------------|
|                                 |                                                                                                               |                        | Circuit Breaker  |                     |                                  |                                                                                                                        |              |                        |                                |
| Encl.                           | NEC/CEC – Hazardous Area Certifications and Compliances                                                       | NEMA/ EEMAC Encl. Type | Type             | Ampere Rating Range | Voltage Range                    | Manufacturer and Frame Size                                                                                            | No. of Poles | Inter-change-able Trip | Enclosure Cover Construction   |
| EFD, EFDC                       | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7BCD, 9EFG          | Thermal-Magnetic | 15–30               | 120AC                            | Sq. D – QOU                                                                                                            | 1            | No                     | Bolted/ Ground Joint           |
| EBMB                            | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3R, 4, 7BCD, 9EFG, 12  | Thermal-Magnetic | 15–800              | 120AC to 600AC<br>125DC to 250DC | G.E. – TEB, TED, TFJ, TFK, TJJ, TJK, TKMA<br>Sq. D – FAL, KAL, LAL, MAL<br>Cut.-Ham. – EHD, FD, FDB, JD, JDB, KD, KDB, | 1, 2, 3      | Yes                    | Bolted/ Ground Joint/ Gasketed |
| EPC                             | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III    | 3, 4, 7CD, 9EFG        | Thermal-Magnetic | 15–150              | 120AC to 600AC<br>125DC to 250DC | G.E. – TEB, TED, TFJ<br>Sq. D – FAL, KAL<br>Cut.-Ham. – EHD, FD, FDB, JD, JDB                                          | 1, 2, 3      | Yes                    | Threaded                       |
| FLB                             | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III    | 3, 7CD, 9EFG           | Thermal-Magnetic | 15–225              | 120AC to 600AC<br>125DC to 250DC | G.E. – TEB, TED, TFJ, TFK<br>Sq. D – FAL, KAL<br>Cut.-Ham. – EHD, FD, FDB, JD, JDB                                     | 1, 2, 3      | Yes                    | Threaded                       |
| EIB                             | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. I, Zones 1 & 2<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. III          | 3, 3R, 4, 7BCD, 9EFG   | Magnetic         | 15–100              | 480AC to 600AC                   | Cut. Ham. – EG                                                                                                         | 3            | No                     | Bolted/ Ground Joint           |
| NCB                             | N/A                                                                                                           | 3, 4X, 12              | Thermal-Magnetic | 15–400              | 240AC to 600VAC<br>250DC         | G.E. – TEB, TED, TFJ<br>Sq. D – FAL, KAL, LAL<br>Cut.-Ham. – EB, EHB, EHD, FD, FDB, JD, JDB                            | 2, 3         | Yes                    | Hinged, screw and gasket       |

## EIB Series

### Compact Circuit Breaker Assemblies With Covers

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. I, Zones 1 & 2  
Cl. II, Div. 1, Groups E, F, G  
Cl. III  
NEMA 3, 3R, 4, 7BCD, 9EFG  
UL Standard: 1203 cUL to CSA C22.2 No. 30

3C

The EIB Series Compact Circuit Breaker Assemblies are an innovative line of explosionproof motor control now being offered by Eaton's Crouse-Hinds. The EIB series utilizes the EJB style D enclosure with its bolted construction, NEMA 4 environmental protection and Class I, Division 1, Group B, C and D hazardous area ratings. The EIB series is a cost-effective solution for circuit breaker protection and utilizes the Cutler-Hammer Type EG circuit breakers. Circuit breaker protection is available from 15 to 100 amps.

#### Features:

- Small compact footprint requires less mounting space and reduces enclosure cost
- Rotary handle operator mounted on cover assembly provides clear indication of on, off and trip positions
- No internal fork operator, eliminating potential damage to breaker toggle
- Trip position easily identified from a distance
- Neoprene cover gasket provides UL Type 4 (hose-tight) environmental rating
- Detachable mounting feet offer flexible mounting alternatives - no need to replace the entire enclosure if a mounting foot is broken
- Stainless steel hinges provide extreme durability and easy access to inside of enclosure for wiring and maintenance
- (2) 1½" NPT conduit entries, one on top and one on bottom for easy top or bottom feed of conductors. For field addition of breather and/or drain; holes come plugged

#### Certifications and Compliances:

- Class I, Divisions 1 & 2, Groups B, C & D
- Class I, Zones 1 & 2
- Class II, Division 1, Groups E, F and G
- Class III
- Enclosure type 3, 3R, 4, 7BCD, 9EFG
- NEMA 3, 3R, 4, 7BCD, 9EFG
- UL Standard 1203
- cUL to CSA C22.2 No. 30

#### Standard Materials:

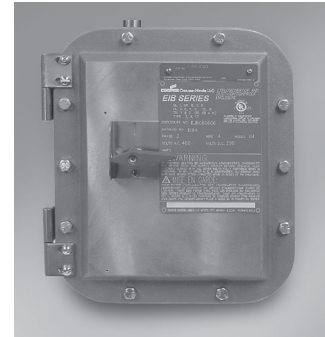
- Body and Cover – Copper-free aluminum
- Gasket – Neoprene
- Cover Bolts – Steel
- Hinges – Stainless Steel
- Mounting Plate Sheet – Aluminum

#### Finishes:

- Copper-free Aluminum – Natural
- Steel – Electro-galvanized

#### Options:

| Description                                                           | Suffix |
|-----------------------------------------------------------------------|--------|
| Insulated Neutral Lug .....                                           | S146   |
| Grounded Neutral Lug Kit with Connectors for 50, 100 & 225 Amps ..... | S178   |
| External Ground Stud .....                                            | S214   |
| Breather and Drain .....                                              | S756V  |
| Epoxy Powder Coat Finish (exterior only) .....                        | S752   |
| Epoxy Powder Coat Finish (exterior and interior) .....                | S753   |



#### Ordering Information

| Circuit Breaker Rating (amps) | Enclosure Only | Enclosure with Circuit Breaker |
|-------------------------------|----------------|--------------------------------|
| 15                            | EIBA           | EIBA3015                       |
| 20                            | EIBA           | EIBA3020                       |
| 25                            | EIBA           | EIBA3025                       |
| 30                            | EIBA           | EIBA3030                       |
| 35                            | EIBA           | EIBA3035                       |
| 40                            | EIBB           | EIBB3040                       |
| 45                            | EIBB           | EIBB3045                       |
| 50                            | EIBB           | EIBB3050                       |
| 60                            | EIBB           | EIBB3060                       |
| 70                            | EIBB           | EIBB3070                       |
| 80                            | EIBB           | EIBB3080                       |
| 90                            | EIBB           | EIBB3090                       |
| 100                           | EIBB           | EIBB3100                       |

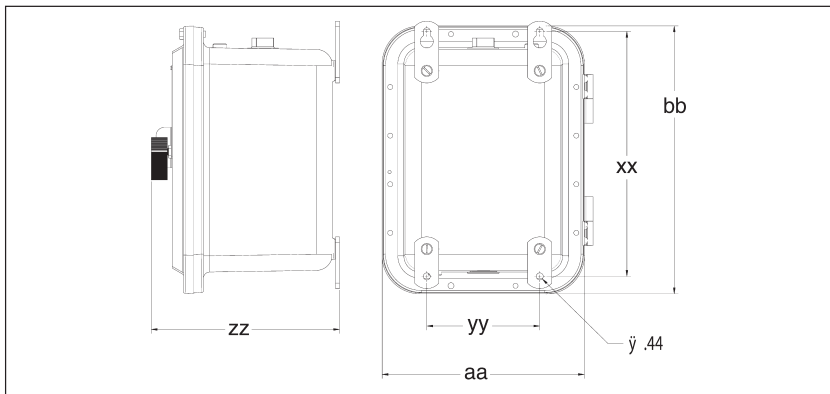
#### Electrical Ratings:

- 600V maximum
- 3 poles
- Ampere Interrupting Capacity:
  - All EIB enclosures are rated to 10k AIC
  - Eaton Type EG Breaker AIC ratings:
    - 240V: 35k AIC
    - 480V: 25k AIC
    - 600V: 18k AIC

#### Weights:

|      |         |
|------|---------|
| EIBA | 39 lbs. |
| EIBB | 58 lbs. |

#### Dimensions In Inches:



| Dimension      | Size A | Size B |
|----------------|--------|--------|
| aa             | 10.47" | 12.53" |
| bb             | 12.47" | 16.53" |
| xx             | 11.13" | 15.13" |
| yy             | 5.0"   | 7.0"   |
| zz             | 9.6"   | 11.66" |
| Mounting Holes | 7/16"  | 7/16"  |

## Crouse-Hinds

by E.T.N

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 3R, 4 $\pm$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

## Applications:

Spectrum™ EBM hinged cover motor control enclosures are used:

- For general motor control and circuit protection – indoors and outdoors – in damp, wet, dirty, dusty hazardous locations without the need for a protective shelter.
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent.
- To provide line disconnect means and short circuit protection.
- For service entrance, feeder or branch circuit protection for lighting, heating, appliance and motor circuits.
- On switchracks or other assemblies where it's desired that motor control be centrally located.

## Features:

- Rugged, corrosion resistant, cast copper-free aluminum construction (less than 0.4 of 1%).
- Circuit breaker operating handle located through the right side wall of the body permits visual confirmation of correct component assembly and operation.
- Total compliance to the wiring end room requirements of the National Electrical Code®.
- Semi-clamshell enclosure design, with an external flanged ground joint between body and cover makes interior components more accessible.
- Minimum enclosure-to-enclosure spacing with little interference between the opened cover and an adjacent enclosure.
- Copper-free aluminum hinges allow the cover to swing well out of the way.
- Stainless steel, quick release, captive, hex head cover bolts. Stainless steel springs provide clear indication cover bolts are fully retracted from body.
- Versatile, internal operating mechanisms allow for field adjustment to accommodate popular manufacturers' breakers.
- Simple, straightforward installation of breaker on pre-drilled mounting plate within enclosure. Mounting plate also field removable.
- Circuit breaker external operating handle can be padlocked in either "ON" or "OFF" positions.
- Neoprene cover gasket permanently attached to the cover seals out moisture.
- Bodies have top and bottom drilled and tapped entrances for power conduits and control conduits. Removable reducers are supplied, as standard, to accommodate smaller size conduits. All conduit entrances are plugged.
- Tap-on mounting feet.
- Optional EMPS control devices may be added to enclosure cover.
- Steel bracket for lifting larger enclosures during installation supplied as standard.



**Spectrum EBM motor control enclosures accommodate popular makes of circuit breakers.**

## Certifications and Compliances:

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- UL Standards UL1203 – Hazardous (classified) locations/CSA Standards: C22.2 No. 30
- UL Subject 2062 - High AIC rating (Interrupting Capacity) For Groups C & D only
  - 240V 65,000 RMS Symm. Amperes
  - 480V 50,000 RMS Symm. Amperes
  - 600V 25,000 RMS Symm. Amperes
- NEMA 3, 3R, 4 $\pm$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shaft and bushing – stainless steel
- Interior parts – sheet steel, electrogalvanized
- Cover bolts, washers and retractile springs – stainless steel

## Electrical Rating Ranges:

- Circuit breakers – 100, 150, 225, 250, 400, 600, 800, 1000\* ampere frame sizes

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

\*1000 Ampere Frame (max. 800 ampere trip)

National Electrical Code is a Registered Trademark of The National Fire Protection Association.

# EBMB Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\ddagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**3C**

## Options:

The following options are available from factory by adding suffix to catalog number. Suffixes are added alphanumerically.

### Catalog Number System

EBMBB-①-WT30FDB36-②

① Options in this position are additions to the enclosure and should be listed alphanumerically.

② Options in this position are modifications to the circuit breaker and should be listed alphanumerically.

| Description                                                                                          | Position in Cat. # | Suffix           |
|------------------------------------------------------------------------------------------------------|--------------------|------------------|
| Ambient compensated circuit breaker trip setting.....                                                | ②                  | AC               |
| Pilot light, 120VAC, red jewel, w/blank indicating plate.....                                        | ①                  | J1 $\ddagger$    |
| Pilot light, 120VAC, green jewel, w/blank indicating plate.....                                      | ①                  | J3 $\ddagger$    |
| LED pilot lights in place of standard incandescent pilot lamps.....                                  | ①                  | LED              |
| Start-stop pushbuttons (requires 2 spaces).....                                                      | ①                  | PB23 $\ddagger$  |
| Space heater, 120 volt, 25 watts.....                                                                | ①                  | R11              |
| Space heater, 240 volt, 25 watts.....                                                                | ①                  | R22              |
| Space heater, 480 volt, 25 watts.....                                                                | ①                  | R44              |
| Insulated neutral w/2 connectors.....                                                                | ①                  | S146             |
| Grounded neutral stud w/3 connectors (50, 100, 225 amp).....                                         | ①                  | S178             |
| Std. drain, Class I, B, C & D; Class II, E F & G, Class III.....                                     | ①                  | S756 $\ddagger$  |
| Std. breather & drain, Class I, B, C & D; Class II, E, F & G; Class III.....                         | ①                  | S756V $\ddagger$ |
| External epoxy finish.....                                                                           | ①                  | S752             |
| Internal and external epoxy finish.....                                                              | ①                  | S753             |
| Aux. switch on circuit breaker, 1A & 1B contacts.....                                                | ②                  | S784             |
| Aux. switch on circuit breaker, 2A & 2B contacts.....                                                | ②                  | S785             |
| 12 point term. block – 30 amp, 300 V.....                                                            | ①                  | S786             |
| General purpose control relay, 4 pole N.O., contacts rated 10A @ 600V, coil 120VAC, 50–60 Hertz..... | ①                  | S787             |



EBMB Series circuit breaker enclosures are available with breakers from 100 to 1000\* amp frame sizes.

**3C**

\*1000 Ampere Frame (max. 800 ampere trip.)

$\ddagger$ If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings and DSL Legend Plate listings see page 449.

$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\ddagger\ddagger$ With S752 or S753.



# 3C EBMB Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

## Ordering Information:

- To order an enclosure complete with circuit breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown below.
- Enclosures can be ordered without circuit breakers. Select from listings below.

## EBMB Series Enclosures for Circuit Breakers

### Circuit Breaker

### Enclosures

| Poles $\ddagger$ | Voltage Rating       | Circuit Breaker Frame Size | Without Circuit Breaker Cat. # | Circuit Breaker Amp Rating | With Circuit Breaker Cat. #  |
|------------------|----------------------|----------------------------|--------------------------------|----------------------------|------------------------------|
| 3                | 240VAC or 125–250VDC | 100 Amp. Frame             | EBMBA *                        | 15A through 70A            | EBMBA TT $\circledast$ TEB32 |
| 3                | 240VAC or 125–250VDC | 150 Amp. Frame             | EBMBA $\dagger$ §              | 10A through 70A            | EBMBA TT $\circledast$ TEB32 |
| 3                | 480VAC or 250VDC     | 100 Amp. Frame             | EBMBA *                        | 15A through 70A            | EBMBA $\circledast$ 2334     |
| 3                | 480VAC or 250VDC     | 150 Amp. Frame             | EBMBA $\dagger$ §              | 10A through 70A            | EBMBA TT $\circledast$ TED34 |
| 3                | 600VAC               | 150 Amp. Frame             | EBMBA $\dagger$ § ■            | 10A through 70A            | EBMBA $\circledast$ 2336     |
| 3                | 240VAC or 125–250VDC | 100 Amp. Frame             | EBMBB *                        | 15A through 100A           | EBMBB TT $\circledast$ TEB32 |
| 3                | 240VAC or 125–250VDC | 150 Amp. Frame             | EBMBB $\dagger$ §              | 10A through 150A           | EBMBB TT $\circledast$ TEB32 |
| 3                | 480VAC or 250VDC     | 100 Amp. Frame             | EBMBB *                        | 15A through 100A           | EBMBB $\circledast$ 2334     |
| 3                | 480VAC or 250VDC     | 150 Amp. Frame             | EBMBB $\dagger$ §              | 10A through 150A           | EBMBB TT $\circledast$ TED34 |
| 3                | 600VAC               | 150 Amp. Frame             | EBMBB $\dagger$ § ■            | 15A through 150A           | EBMBB $\circledast$ 2336     |
| 3                | 600VAC               | 250 Amp. Frame             | EBMBG $\circledast$ ▲          | 70A through 250A           | EBMBG $\circledast$ 2336     |
| 3                | 600VAC or 250VDC     | 400 Amp. Frame             | EBMBK ▼                        | 100A through 400A          | EBMBK $\circledast$ 2336     |
| 3                | 600VAC or 250VDC     | 600 Amp. Frame             | EBMBL ♠                        | 250A through 600A          | EBMBL WT $\circledast$ 336   |
| 3                | 600VAC or 250VDC     | 800 Amp. Frame             | EBMBL ♥                        | 300A through 800A          | EBMBL WT $\circledast$ 336   |

### ①Circuit Breakers:

| Manufacturer     | Symbol |
|------------------|--------|
| Cutler-Hammer    | WT     |
| General Electric | TT     |

### ② Select Trip Setting from below:

100 Amp. Frame (EHD)\* – 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100  
150 Amp. Frame (TDB, TEB, TED) $\dagger$ § – 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150  
225 / 250 Amp. Frame (JD, JDB, TFJ, TFK) $\circledast$ ▲ – 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250  
400 Amp. Frame (KD, KDB, TJJ, TJK)▼ – 100, 125, 150, 175, 200, 225, 250, 300, 350, 400  
600 Amp. Frame (LD, TJK)♠ – 250, 300, 350, 400, 450, 500, 600  
800 Amp. Frame (MD, TKMA)♥ – 300, 350, 400, 450, 500, 600, 700, 800

### ③Select Circuit Breaker Frame Type based on frame size, voltage, and manufacturer desired:

| Manufacturer     | 100 Amp. Frame<br>240VAC | 100 Amp. Frame<br>480VAC | 600VAC | 150 Amp. Frame<br>240VAC | 150 Amp. Frame<br>480VAC | 600VAC | 250 Amp. Frame<br>600VAC $\circledast$ ▲ | 400 Amp. Frame<br>600VAC               | 600 Amp. Frame<br>600VAC | 800 Amp. Frame<br>600VAC |
|------------------|--------------------------|--------------------------|--------|--------------------------|--------------------------|--------|------------------------------------------|----------------------------------------|--------------------------|--------------------------|
| Cutler-Hammer    | —                        | EHD                      | —      | —                        | —                        | FDB    | JD $\circledast$<br>JDB $\circledast$    | KD $\circledast$<br>KDB $\circledast$  | LD                       | MD                       |
| General Electric | TEB                      | —                        | —      | —                        | TED                      | TED    | TFK $\circledast$<br>TFJ $\circledast$   | TJK $\circledast$<br>TJJ $\circledast$ | TJK                      | TKMA                     |

$\circledast$ —Interchangeable Trip Unit

♠—Non-Interchangeable Trip Unit

$\ddagger$  Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\dagger\dagger$ With S752 or S753.

$\circledast$  Depending on availability from the circuit breaker manufacturer 1 and 2 pole can be furnished. Information available upon request. Example of an adjusted part number - EBMBB WT100EDH34 becomes EBMBB WT100EDH24.

\* EBMBA will accept 15 through 70 amp. trip, EBMBB will accept 15 through 100 amp. trip.

$\dagger$  EBMBA will accept 10 through 70 amp. trip, EBMBB will accept 10 through 150 amp. trip.

§ General Electric TEB frame available 10 through 100 amp. trip. TED frame available 10 through 150 amp. trip.

■ Westinghouse FDB frame available 15 through 150 amp. trip.

$\circledast$  General Electric TFJ and TFK types are 225 amp. frame, available 70 through 225 amp. trip.

▲ Westinghouse JD and JDB types are 250 amp. frame, available 70, 90, 100 and 125 through 250 amp. trip.

▼ Westinghouse KD and KDB frames available 100 through 400 amp. trip. General Electric TJJ and TJK frames available 125 through 400 amp. trip.

♠ Westinghouse LD frame available 300 through 400 and 500, 600 amp. trip.

♥ Westinghouse MD frame available 400 and 500 through 800 amp. trip.

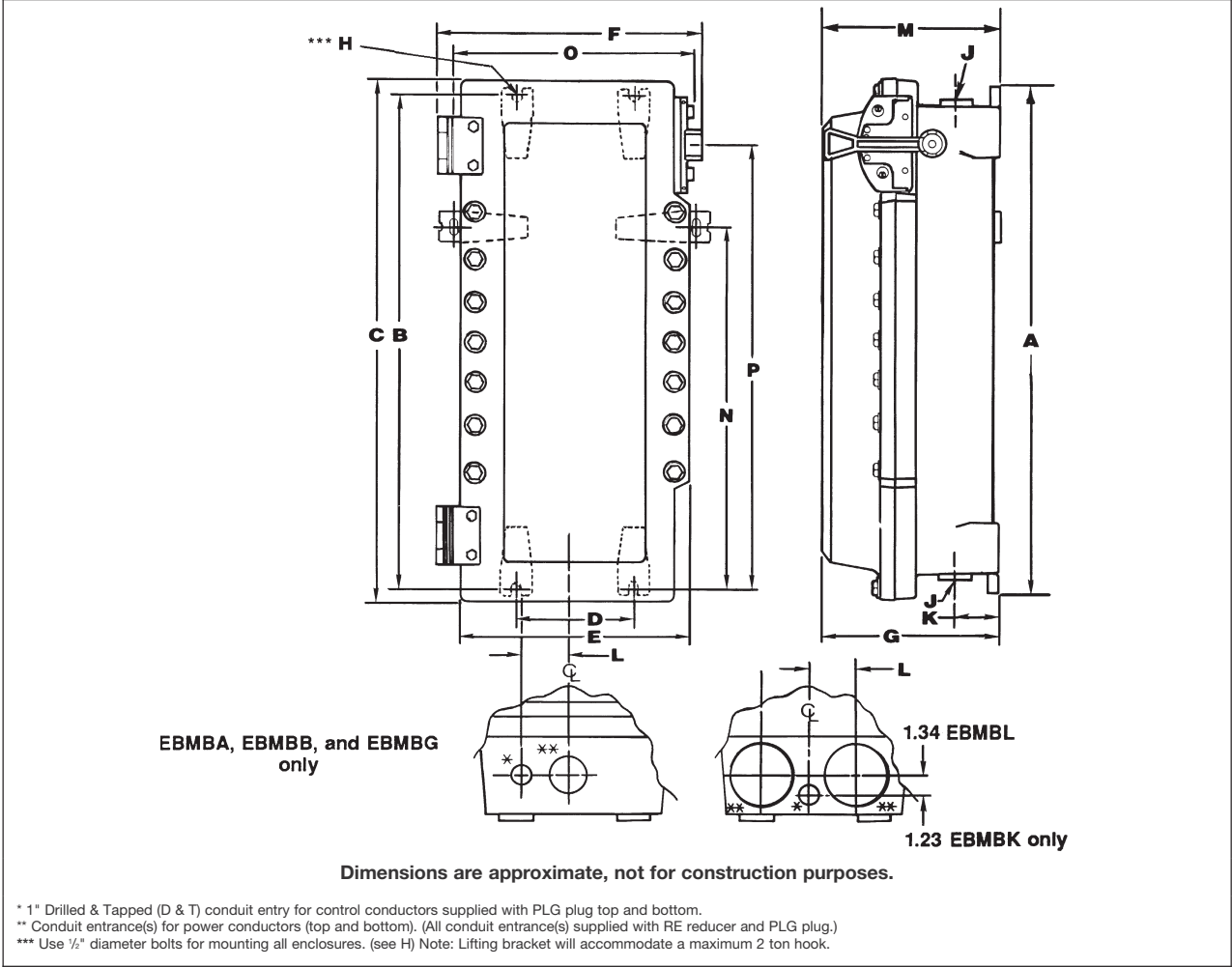
EBMB Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

3C

Dimensions  
In Inches:



| Enclosure Only<br>Cat. #     | Enclosure Size<br>Symbol | Dimensions |       |       |       |       |       |       |       | J** Conduit Entry Trade Size |      | Dimensions |       |       |       |       |  |  |
|------------------------------|--------------------------|------------|-------|-------|-------|-------|-------|-------|-------|------------------------------|------|------------|-------|-------|-------|-------|--|--|
|                              |                          | A          | B     | C     | D     | E     | F     | G     | D&T§  | w/RE                         | K    | L          | M     | N     | O     | P     |  |  |
| 100 Amp Frame                |                          |            |       |       |       |       |       |       |       |                              |      |            |       |       |       |       |  |  |
| EBMBA                        | A                        | 18.25      | 17.25 | 19.40 | 6.00  | 13.03 | 14.78 | 10.25 | 2"    | 1.5"                         | 3.25 | 3.13       | 10.25 | —     | —     | 14.50 |  |  |
| 100 and 150 Amp Frame        |                          |            |       |       |       |       |       |       |       |                              |      |            |       |       |       |       |  |  |
| EBMBB                        | B                        | 25.75      | 24.75 | 26.90 | 6.00  | 13.03 | 14.78 | 10.25 | 2"    | 1.5"                         | 3.25 | 3.13       | 10.25 | —     | —     | 22.00 |  |  |
| 225 and 250 Amp Frame        |                          |            |       |       |       |       |       |       |       |                              |      |            |       |       |       |       |  |  |
| EBMBG                        | G                        | 37.50      | 36.50 | 39.28 | 6.00  | 13.03 | 14.78 | 10.25 | 3.0"  | 2.5"                         | 3.25 | 3.13       | 10.25 | —     | —     | 34.06 |  |  |
| 400 Amp Frame                |                          |            |       |       |       |       |       |       |       |                              |      |            |       |       |       |       |  |  |
| EBMBK                        | K                        | 43.12      | 41.50 | 42.65 | 12.00 | 17.65 | 20.28 | 10.92 | (2)3" | (2)2.5"                      | 3.25 | 3.00       | 10.92 | —     | —     | 29.23 |  |  |
| 600, 800 and 1000 Amp Frame† |                          |            |       |       |       |       |       |       |       |                              |      |            |       |       |       |       |  |  |
| EBMBL                        | L                        | 53.25      | 51.50 | 53.28 | 12.00 | 17.90 | 20.58 | 13.03 | (2)4" | (2)3.5"                      | 4.00 | 3.50       | 13.13 | 41.50 | 18.40 | 29.88 |  |  |

†1000 Ampere Frame (max. 800 ampere trip)

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators. Breather and drain entries must be plugged for NEMA 4 rating.

††With S752 or S753.

§Drilled & Tapped.

|                                |                    |
|--------------------------------|--------------------|
| Cl. I, Div. 1 & 2, Groups C, D | Explosionproof     |
| Cl. II, Div. 1, Groups E, F, G | Dust-Ignitionproof |
| Cl. II, Div. 2, Groups F, G    | Raintight          |
| Cl. III                        | Wet Locations      |
| NEMA 3, 4, 7CD, 9EFG           | Watertight         |

## Applications:

EPC Circuit Breakers and Enclosures are used:

- For service entrance\*, feeder or branch circuit protection for lighting, heating, appliance and motor circuits
- In areas made hazardous due to the presence of flammable vapors, gases or combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical or petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnect means, short circuit protection and thermal time delay overload protection

## Features:

- Quick-opening covers – less than two turns to remove or install
- Three section design for ease of installation
- Water-shedding construction with female threads on top cover, male threads on bottom cover, and top cover skirted
- Specially located stops and locks insure adequate thread engagement and prevent overtightening
- Separate replaceable mounting bracket attached to the rear of the body provides three-point suspension for quick installation and leveling – one keyhole slot at top and two open slots at bottom
- Bodies have two taper-tapped conduit hubs with integral bushings on the top, and two more directly below
- Mounting plates are supplied with all necessary holes and hardware to attach any of the circuit breakers shown in the catalog listings. Breaker and interior mounting frames are easily removed as a unit, providing free access to the wiring chamber
- Breaker is operated by an external handle which can be padlocked in either "ON" or "OFF" positions by as many as three padlocks. Breaker is trip-free of the handle and will open under short circuit or overload, even if the handle is locked in the "ON" position

## Certifications and Compliances:

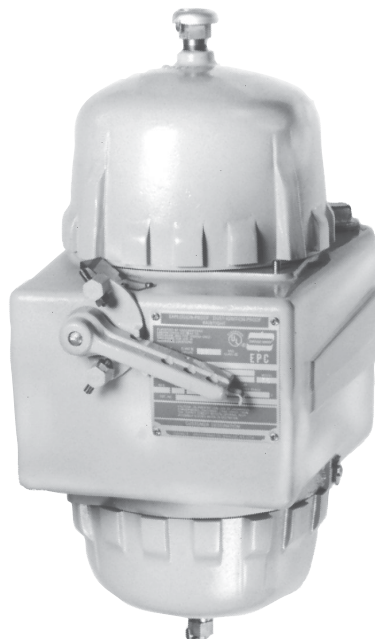
- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 4, 7CD, 9EFG
- UL Standard: 698
- CSA: C22.2 No. 30

## Standard Materials:

- Bodies and covers – copper-free aluminum
- Operating handles – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized



## Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                                  | Suffix  |
|----------------------------------------------------------------------------------------------|---------|
| Auxiliary Switch†                                                                            |         |
| 1A/1B (1P2T).....                                                                            | S784    |
| 2A/2B (2P2T).....                                                                            | S785    |
| Insulated neutral with 2 connectors (100, 150 and 225 amp.)                                  | S146    |
| Grounded neutral stud with 3 connectors (100, 150 and 225 amp.).....                         | S178    |
| Side bosses drilled and tapped same size as standard hubs.                                   | S366    |
| Back boss drilled and tapped same size as standard hubs...                                   | S367    |
| Standard Breather (Class I, Groups C, D; Class II, Groups E, F, G; Class III).....           | S219    |
| Standard Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III).....              | S198    |
| Standard Breather and Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III)..... | S198V   |
| Universal Breather-Drain (Class I, Groups C, D; Class II, Groups F, G).....                  | S454\$  |
| (2) Universal Breather-Drains (Class I, Groups C, D; Class II, Groups F, G).....             | S454V\$ |

## Electrical Rating Ranges:

- 100, 150, 225, 250 ampere frame sizes

\*Suffix S146 insulated material must be used to comply with NEC requirements for service entrance.

†Application is limited by circuit breaker design – Consult Factory.

\$Not suitable for NEMA 4.

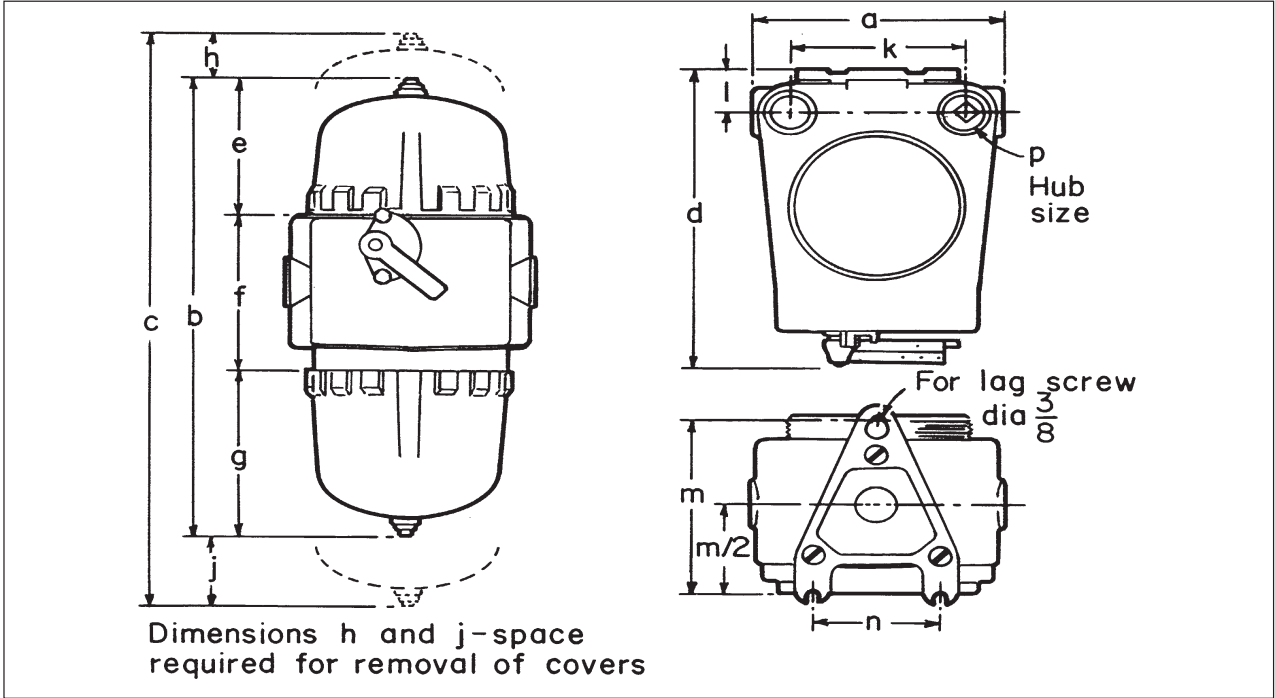
# EPC Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

3C

## Dimensions In Inches\*



|           | EPC377                           | EPC387                           |
|-----------|----------------------------------|----------------------------------|
| Int. Dia. | 7"                               | 7"W                              |
| a         | 10 <sup>5</sup> / <sub>8</sub>   | 12 <sup>13</sup> / <sub>16</sub> |
| b         | 19 <sup>13</sup> / <sub>16</sub> | 19 <sup>9</sup> / <sub>16</sub>  |
| c         | 23 <sup>13</sup> / <sub>16</sub> | 23 <sup>13</sup> / <sub>16</sub> |
| d         | 14 <sup>3</sup> / <sub>8</sub>   | 14 <sup>3</sup> / <sub>8</sub>   |
| e         | 6 <sup>3</sup> / <sub>4</sub>    | 6 <sup>3</sup> / <sub>4</sub>    |
| f         | 7 <sup>11</sup> / <sub>16</sub>  | 7 <sup>11</sup> / <sub>16</sub>  |
| g         | 5 <sup>3</sup> / <sub>8</sub>    | 5 <sup>3</sup> / <sub>8</sub>    |
| h         | 2                                | 2                                |
| j         | 2                                | 2                                |
| k         | 7 <sup>3</sup> / <sub>8</sub>    | 9 <sup>1</sup> / <sub>4</sub>    |
| l         | 2 <sup>1</sup> / <sub>16</sub>   | 2 <sup>1</sup> / <sub>16</sub>   |
| m         | 9 <sup>3</sup> / <sub>8</sub>    | 9 <sup>3</sup> / <sub>8</sub>    |
| n         | 5 <sup>1</sup> / <sub>4</sub>    | 5 <sup>1</sup> / <sub>4</sub>    |
| p         | 1 <sup>1</sup> / <sub>4</sub>    | 2                                |

\*Dimensions are approximate, not for construction purposes.

# 3C

## EPC Series Circuit Breakers and Enclosures

100/150A Frame, Thermal Magnetic,  
120–240 VAC, 125–250 VDC

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### Ordering Information:

To order an enclosure complete with circuit breaker where there is a choice of manufacturer, insert the manufacturer's symbol in the designated position of the catalog number.

Enclosures only can be ordered. Select from listings.

### Non-Interchangeable Trip

| Circuit Breaker |                            | Enclosure    |             | Circuit Bkr.<br>Amp<br>Rating | Without Circuit<br>Bkr. Cat. # | With Circuit<br>Bkr. Cat. # |
|-----------------|----------------------------|--------------|-------------|-------------------------------|--------------------------------|-----------------------------|
| Poles           | Voltage<br>Rating          | Int.<br>Dia. | Hub<br>Size |                               |                                |                             |
| 3C              | 240VAC<br>or<br>125-250VDC | 7            | 1¼          | 15                            | EPC377                         | EPC377 ①15EB 2              |
|                 |                            |              |             | 20                            |                                | EPC377 ①20EB 2              |
|                 |                            |              |             | 30                            |                                | EPC377 ①30EB 2              |
|                 |                            |              |             | 40                            |                                | EPC377 ①40EB 2              |
|                 |                            |              |             | 50                            |                                | EPC377 ①50EB 2              |
|                 |                            |              |             | 70                            |                                | EPC377 ①70EB 2              |
|                 |                            |              |             | 90                            |                                | EPC377 ①90EB 2              |
|                 |                            |              |             | 100                           |                                | EPC377 ①100EB 2             |
|                 |                            | 7W           | 2           | 70                            | EPC387                         | EPC387 ① 70EB 2             |
|                 |                            |              |             | 90                            |                                | EPC387 ① 90EB 2             |
|                 |                            |              |             | 100                           |                                | EPC387 ① 100EB 2            |
| 3               | 240VAC*                    | 7            | 1¼          | 15                            | EPC377                         | EPC377 ①15EB 3              |
|                 |                            |              |             | 20                            |                                | EPC377 ①20EB 3              |
|                 |                            |              |             | 30                            |                                | EPC377 ①30EB 3              |
|                 |                            |              |             | 40                            |                                | EPC377 ①40EB 3              |
|                 |                            |              |             | 50                            |                                | EPC377 ①50EB 3              |
|                 |                            |              |             | 70                            |                                | EPC377 ①70EB 3              |
|                 |                            |              |             | 90                            |                                | EPC377 ①99EB 3              |
|                 |                            |              |             | 100                           |                                | EPC377 ①100EB 3             |
|                 |                            | 7W           | 2           | 70                            | EPC387                         | EPC387 ① 70EB 3             |
|                 |                            |              |             | 90                            |                                | EPC387 ① 90EB 3             |
|                 |                            |              |             | 100                           |                                | EPC387 ① 100EB 3            |

\*Square D 240VAC/125–250VDC

① Circuit Breakers

| Manufacturer     | Frame | Symbol |
|------------------|-------|--------|
| General Electric | TEB   | TT     |
| Cutler-Hammer    | ED    | WT     |

# EPC Series Circuit Breakers and Enclosures

100/150A Frame, Thermal Magnetic, 480–600 VAC, 250 VDC

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

3C

## Non-Interchangeable Trip

| Circuit Breaker |                  | Enclosure |          | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cat. # |
|-----------------|------------------|-----------|----------|-------------------------|-----------------------------|--------------------------|
| Poles           | Voltage Rating   | Int. Dia. | Hub Size |                         |                             |                          |
| 2               | 480VAC or 250VDC | 7         | 1¼       | 15                      | EPC377                      | EPC377 ①15EHD 2          |
|                 |                  |           |          | 20                      |                             | EPC377 ①20EHD 2          |
|                 |                  |           |          | 30                      |                             | EPC377 ①30EHD 2          |
|                 |                  |           |          | 40                      |                             | EPC377 ①40EHD 2          |
|                 |                  |           |          | 50                      |                             | EPC377 ①50EHD 2          |
|                 |                  |           |          | 70                      |                             | EPC377 ①70EHD 2          |
|                 |                  | 7W        | 2        | 90                      | EPC387                      | EPC377 ①90EHD 2          |
|                 |                  |           |          | 100                     |                             | EPC377 ①100EHD 2         |
|                 |                  |           |          | 70                      |                             | EPC387 ①70EHD 2          |
|                 |                  |           |          | 90                      |                             | EPC387 ①90EHD 2          |
|                 |                  |           |          | 100                     |                             | EPC387 ①100EHD 2         |
| 3               | 480VAC           | 7         | 1¼       | 15                      | EPC377                      | EPC377 ①15EHD 3          |
|                 |                  |           |          | 20                      |                             | EPC377 ①20EHD 3          |
|                 |                  |           |          | 30                      |                             | EPC377 ①30EHD 3          |
|                 |                  |           |          | 40                      |                             | EPC377 ①40EHD 3          |
|                 |                  |           |          | 50                      |                             | EPC377 ①50EHD 3          |
|                 |                  |           |          | 70                      |                             | EPC377 ①70EHD 3          |
|                 |                  | 7W        | 2        | 90                      | EPC387                      | EPC377 ①90EHD 3          |
|                 |                  |           |          | 100                     |                             | EPC377 ①100EHD 3         |
|                 |                  |           |          | 70                      |                             | EPC387 ①70EHD 3          |
|                 |                  |           |          | 90                      |                             | EPC387 ①90EHD 3          |
|                 |                  |           |          | 100                     |                             | EPC387 ①100EHD 3         |
| 2               | 600VAC or 250VDC | 7         | 1¼       | 15                      | EPC377                      | EPC377 ②15FDB 2          |
|                 |                  |           |          | 20                      |                             | EPC377 ②20FDB 2          |
|                 |                  |           |          | 30                      |                             | EPC377 ②30FDB 2          |
|                 |                  |           |          | 40                      |                             | EPC377 ②40FDB 2          |
|                 |                  |           |          | 50                      |                             | EPC377 ②50FDB 2          |
|                 |                  |           |          | 70                      |                             | EPC377 ②70FDB 2          |
|                 |                  | 7W        | 2        | 90                      | EPC387                      | EPC377 ②90FDB 2          |
|                 |                  |           |          | 100                     |                             | EPC377 ②100FDB 2         |
|                 |                  |           |          | 70                      |                             | EPC387 ②70FDB 2          |
|                 |                  |           |          | 90                      |                             | EPC387 ②90FDB 2          |
|                 |                  |           |          | 100                     |                             | EPC387 ②100FDB 2         |
|                 |                  |           |          | 110                     |                             | EPC387 ②110FDB 2         |
| 3               | 600VAC           | 7         | 1¼       | 125                     | EPC387                      | EPC387 ②125FDB 2         |
|                 |                  |           |          | 150                     |                             | EPC387 ②150FDB 2         |
|                 |                  | 7W        | 2        | 70                      | EPC377                      | EPC377 ②15FDB 3          |
|                 |                  |           |          | 90                      |                             | EPC377 ②20FDB 3          |
|                 |                  |           |          | 100                     |                             | EPC377 ②30FDB 3          |
|                 |                  |           |          | 110                     |                             | EPC377 ②40FDB 3          |
|                 |                  |           |          | 125                     |                             | EPC377 ②50FDB 3          |
|                 |                  |           |          | 150                     |                             | EPC377 ②70FDB 3          |
|                 |                  | 7W        | 2        | 70                      | EPC387                      | EPC377 ②90FDB 3          |
|                 |                  |           |          | 90                      |                             | EPC377 ②100FDB 3         |
|                 |                  |           |          | 100                     |                             | EPC387 ②70FDB 3          |
|                 |                  |           |          | 110                     |                             | EPC387 ②90FDB 3          |
|                 |                  |           |          | 125                     |                             | EPC387 ②100FDB 3         |
|                 |                  |           |          | 150                     |                             | EPC387 ②110FDB 3         |

① Circuit Breakers

| Manufacturer     | Frame | Symbol |
|------------------|-------|--------|
| General Electric | TED   | TT     |
| Cutler-Hammer    | EHD   | WT     |

② Circuit Breakers

| Manufacturer     | Frame   | Symbol |
|------------------|---------|--------|
| General Electric | TED     | TT     |
| Cutler-Hammer    | FD, FDB | WT     |

Crouse-Hinds

by E.T.N

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3C

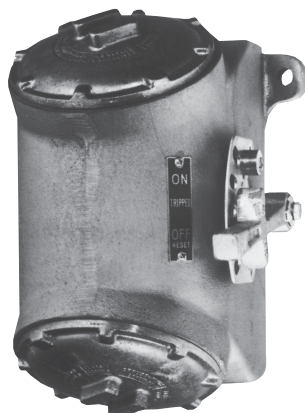
Cl. I, Div. 1 & 2, Groups C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 4, 7CD, 9EFG

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

## Applications:

FLB circuit breakers and enclosures are used:

- For service entrance, feeder or branch circuit protection for lighting, heating, appliance and motor circuits
- In areas made hazardous due to the presence of flammable vapors, gases or combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnect means, short circuit protection and thermal time delay overload protection



## Features:

- Semi-cylindrical body shape for maximum strength at lowest practical weight
- Round threaded covers at each end, set at an angle to provide ready access to interior for ease of wiring
- Breaker is operated by an external handle which can be padlocked in either "ON" or "OFF" positions. Breaker is trip-free of the handle and will open under short circuit or overload even if the handle is locked in the "ON" position
- Bodies have vertical through feed conduit hubs of sizes given in the listings

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 4, 7CD, 9EFG
- UL Standard: 698
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Bodies, covers and operating handles – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – zinc electroplate with chromate finish

## Electrical Rating Ranges:

- 100 and 225 ampere frame sizes

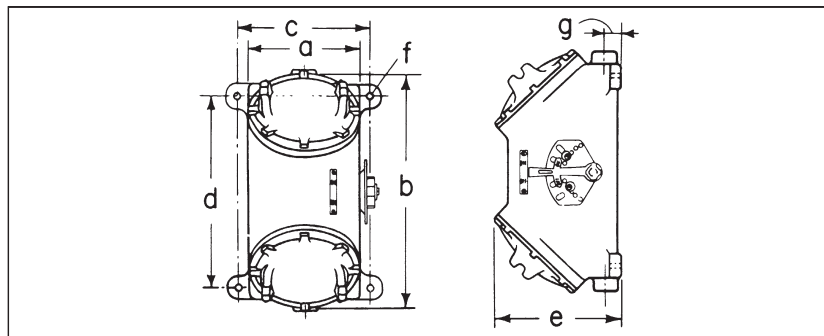
## Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                             | Suffix |
|-----------------------------------------------------------------------------------------|--------|
| 2 lugs for neutral connections (50, 100 and 225 amp.)                                   | S146   |
| Ground neutral stud with 3 connectors (50, 100 and 225 amp.)                            | S168   |
| Standard Breather (Class I, Groups C, D; Class II, Groups E, F, G; Class III)           | S219   |
| Standard Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III)              | S198   |
| Standard Breather and Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III) | S198V  |
| Universal Breather – Drain (Class I, Groups C, D; Class II, Groups F, G)                | S454*  |
| (2) Universal Breather – Drains (Class I, Groups C, D; Class II, Groups F, G)           | S454V* |
| Specify Auxiliary Switch†                                                               |        |
| 1A/1B (1P2T)                                                                            | S784   |
| 2A/2B (2P2T)                                                                            | S785   |

## Dimensions

In Inches§:



| Cat. #                                                                                 | a      | b      | c      | d     | e      | f     | g      |
|----------------------------------------------------------------------------------------|--------|--------|--------|-------|--------|-------|--------|
| †FLB140, 220, 221                                                                      | 5 1/4  | 10 1/4 | 6 1/4  | 7 1/4 | 7      | 7/16  | 1 1/8  |
| FLB115, 141, 147, 148, 171, 172, 173, 175, 222, 361, 116, 142, 149, 174, 177, 223, 362 | 7 1/2  | 13 3/8 | 8 1/2  | 9 3/4 | 9 1/8  | 7/16  | 1 3/4  |
| FLB224, 225, 264, 265, 267, 346                                                        | 13 3/4 | 22 1/2 | 16 1/4 | 9 7/8 | 15 1/2 | 21/32 | 2 7/16 |

\*Not suitable for NEMA 4/EEMAC.

†With two mounting feet, one at upper right and one at lower left.

‡Application is limited by circuit breaker design – Consult Factory.

§Dimensions are approximate, not for construction purposes.



# FLB Series Circuit Breakers and Enclosures

**100A Frame, Thermal Magnetic,  
120 VAC/125 VDC, 240 VAC/250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**3C**

## Ordering Information:

To order an enclosure complete with circuit breaker where there is a choice of manufacturer, insert the manufacturer's symbol in the designated position of the catalog number.

Enclosures only can be ordered. Select from listings.

## 100 Ampere Frame Size with Non-Interchangeable Trip 240VAC Max.

| Circuit Breaker |                            | Enclosure      |                         |                             |                                                 |
|-----------------|----------------------------|----------------|-------------------------|-----------------------------|-------------------------------------------------|
| Poles           | Voltage Rating             | Hub Size       | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. General Electric "TEB" Cat. # |
| 1               | 120VAC<br>or<br>125VDC     | $\frac{3}{4}$  | 15                      | FLB220                      | FLB220 TT15 1                                   |
|                 |                            |                | 20                      |                             | FLB220 TT20 1                                   |
|                 |                            |                | 30                      |                             | FLB220 TT30 1                                   |
|                 |                            |                | 40                      |                             | FLB220 TT40 1                                   |
|                 |                            |                | 50                      |                             | FLB220 TT50 1                                   |
| 2               | 240VAC<br>or<br>125–250VDC | 1              | 15                      | FLB221                      | FLB221 TT15 2                                   |
|                 |                            |                | 20                      |                             | FLB221 TT20 2                                   |
|                 |                            |                | 30                      |                             | FLB221 TT30 2                                   |
|                 |                            |                | 40                      |                             | FLB221 TT40 2                                   |
|                 |                            |                | 50                      |                             | FLB221 TT50 2                                   |
|                 |                            | $1\frac{1}{2}$ | 70                      | FLB223                      | FLB223 TT70 2                                   |
|                 |                            |                | 90                      |                             | FLB223 TT90 2                                   |
|                 |                            |                | 100                     |                             | FLB223 TT100 2                                  |
|                 |                            | $1\frac{1}{4}$ | 15                      | FLB222                      | FLB222 TT15 3                                   |
|                 |                            |                | 20                      |                             | FLB222 TT20 3                                   |
|                 |                            |                | 30                      |                             | FLB222 TT30 3                                   |
|                 |                            |                | 40                      |                             | FLB222 TT40 3                                   |
|                 |                            |                | 50                      |                             | FLB222 TT50 3                                   |
| 3               | 240VAC                     | $1\frac{1}{2}$ | 70                      | FLB223                      | FLB223 TT70 3                                   |
|                 |                            |                | 90                      |                             | FLB223 TT90 3                                   |
|                 |                            |                | 100                     |                             | FLB223 TT100 3                                  |

3C

# 3C

## FLB Series Circuit Breakers and Enclosures

**100A Frame, Thermal Magnetic,  
120–480 VAC, 125–250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### 100 Ampere Frame Size with Non-Interchangeable Trip 480VAC Max.

| Circuit Breaker |                  | Enclosure |                         |                             |                                              |                                                    |
|-----------------|------------------|-----------|-------------------------|-----------------------------|----------------------------------------------|----------------------------------------------------|
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "EHD" Cat. # | With Circuit Breaker General Electric "TED" Cat. # |
| 2               | 480VAC or 250VDC | 1         | 15                      | FLB140                      | FLB140 WT15 2                                | FLB140 TT15 2                                      |
|                 |                  |           | 20                      |                             | FLB140 WT20 2                                | FLB140 TT20 2                                      |
|                 |                  |           | 30                      |                             | FLB140 WT30 2                                | FLB140 TT30 2                                      |
|                 |                  |           | 40                      |                             | FLB140 WT40 2                                | FLB140 TT40 2                                      |
|                 |                  |           | 50                      |                             | FLB140 WT50 2                                | FLB140 TT50 2                                      |
|                 |                  | 1½        | 70                      | FLB142                      | FLB142 WT70 2                                | FLB142 TT70 2                                      |
|                 |                  |           | 90                      |                             | FLB142 WT90 2                                | FLB142 TT90 2                                      |
|                 |                  |           | 100                     |                             | FLB142 WT100 2                               | FLB142 TT100 2                                     |
|                 |                  | 1¼        | 15                      | FLB141                      | FLB141 WT15 3                                | FLB141 TT15 3                                      |
|                 |                  |           | 20                      |                             | FLB141 WT20 3                                | FLB141 TT20 3                                      |
|                 |                  |           | 30                      |                             | FLB141 WT30 3                                | FLB141 TT30 3                                      |
|                 |                  |           | 40                      |                             | FLB141 WT40 3                                | FLB141 TT40 3                                      |
|                 |                  |           | 50                      |                             | FLB141 WT50 3                                | FLB141 TT50 3                                      |
| 3               | 480VAC           | 1½        | 70                      | FLB142                      | FLB142 WT70 3                                | FLB142 TT70 3                                      |
|                 |                  |           | 90                      |                             | FLB142 WT90 3                                | FLB142 TT90 3                                      |
|                 |                  |           | 100                     |                             | FLB142 WT100 3                               | FLB142 TT100 3                                     |

# FLB Series Circuit Breakers and Enclosures

**100A Frame, Thermal Magnetic, 600 VAC, 250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**3C**

## 100 Ampere Frame Size with Non-Interchangeable Trip 600VAC Max.

| Circuit Breaker |                  | Enclosure |                         |                             |                                                 |
|-----------------|------------------|-----------|-------------------------|-----------------------------|-------------------------------------------------|
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "FDB" Cat. #    |
| 2               | 600VAC or 250VDC | 1¼        | 15                      | FLB115                      | FLB115 WT15 2                                   |
|                 |                  |           | 20                      |                             | FLB115 WT20 2                                   |
|                 |                  |           | 30                      |                             | FLB115 WT30 2                                   |
|                 |                  |           | 40                      |                             | FLB115 WT40 2                                   |
|                 |                  |           | 50                      |                             | FLB115 WT50 2                                   |
|                 |                  | 1½        | 70                      | FLB116                      | FLB116 WT70 2                                   |
|                 |                  |           | 90                      |                             | FLB116 WT90 2                                   |
|                 |                  |           | 100                     |                             | FLB116 WT100 2                                  |
| 3               | 600VAC           | 1¼        | 15                      | FLB115                      | FLB115 WT15 3                                   |
|                 |                  |           | 20                      |                             | FLB115 WT20 3                                   |
|                 |                  |           | 30                      |                             | FLB115 WT30 3                                   |
|                 |                  |           | 40                      |                             | FLB115 WT40 3                                   |
|                 |                  |           | 50                      |                             | FLB115 WT50 3                                   |
|                 |                  | 1½        | 70                      | FLB116                      | FLB116 WT70 3                                   |
|                 |                  |           | 90                      |                             | FLB116 WT90 3                                   |
|                 |                  |           | 100                     |                             | FLB116 WT100 3                                  |
| Circuit Breaker |                  | Enclosure |                         |                             |                                                 |
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. General Electric "TED" Cat. # |
| 3               | 600VAC           | 1¼        | 15                      | FLB361                      | FLB361 TT15 3                                   |
|                 |                  |           | 20                      |                             | FLB361 TT20 3                                   |
|                 |                  |           | 30                      |                             | FLB361 TT30 3                                   |
|                 |                  |           | 40                      |                             | FLB361 TT40 3                                   |
|                 |                  |           | 50                      |                             | FLB361 TT50 3                                   |
|                 |                  | 1½        | 70                      | FLB362                      | FLB362 TT70 3                                   |
|                 |                  |           | 90                      |                             | FLB362 TT90 3                                   |
|                 |                  |           | 100                     |                             | FLB362 TT100 3                                  |

3C

# 3C

## FLB Series Circuit Breakers and Enclosures

**225A Frame, Thermal Magnetic,  
600 VAC, 250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### 100 Ampere Frame Size with Non-Interchangeable Trip 600VAC Max.

| Circuit Breaker |                        | Enclosure |                         |                             |                                                 |
|-----------------|------------------------|-----------|-------------------------|-----------------------------|-------------------------------------------------|
| Poles           | Voltage Rating         | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "JDB"† Cat. #   |
| 2               | 600VAC<br>or<br>250VDC | 2½        | 125                     | FLB264                      | FLB264 WT125 2                                  |
|                 |                        |           | 150                     |                             | FLB264 WT150 2                                  |
|                 |                        |           | 175                     |                             | FLB264 WT175 2                                  |
|                 |                        |           | 200                     |                             | FLB264 WT200 2                                  |
|                 |                        |           | 225                     |                             | FLB264 WT225 2                                  |
| 3               | 600VAC                 | 2½        | 125                     | FLB264                      | FLB264 WT125 3                                  |
|                 |                        |           | 150                     |                             | FLB264 WT150 3                                  |
|                 |                        |           | 175                     |                             | FLB264 WT175 3                                  |
|                 |                        |           | 200                     |                             | FLB264 WT200 3                                  |
|                 |                        |           | 225                     |                             | FLB264 WT225 3                                  |
| Poles           | Voltage Rating         | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. General Electric "TFJ" Cat. # |
| 3               | 600VAC                 | 2½        | 125                     | FLB224 or FLB346            | FLB224 TT125 3                                  |
|                 |                        |           | 150                     |                             | FLB224 TT150 3                                  |
|                 |                        |           | 175                     |                             | FLB224 TT175 3                                  |
|                 |                        |           | 200                     |                             | FLB224 TT200 3                                  |
|                 |                        |           | 225                     |                             | FLB224 TT225 3                                  |

### 100 Ampere Frame Size with Interchangeable Trip 600VAC Max.

| Circuit Breaker |                        | Enclosure |                         |                             |                                             |                                                 |
|-----------------|------------------------|-----------|-------------------------|-----------------------------|---------------------------------------------|-------------------------------------------------|
| Poles           | Voltage Rating         | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "JD" Cat. # | With Circuit Bkr. General Electric "TFK" Cat. # |
| 2               | 600VAC<br>or<br>250VDC | 3         | 125                     | FLB267                      | FLB267 WT125 2                              |                                                 |
|                 |                        |           | 150                     |                             | FLB267 WT150 2                              |                                                 |
|                 |                        |           | 175                     |                             | FLB267 WT175 2                              |                                                 |
|                 |                        |           | 200                     |                             | FLB267 WT200 2                              |                                                 |
|                 |                        |           | 225                     |                             | FLB267 WT225 2                              |                                                 |
| 3               | 600VAC                 | 3         | 125                     | FLB267 or FLB225            | FLB267 WT125 3                              | FLB225 TT125 3                                  |
|                 |                        |           | 150                     |                             | FLB267 WT150 3                              | FLB225 TT150 3                                  |
|                 |                        |           | 175                     |                             | FLB267 WT175 3                              | FLB225 TT175 3                                  |
|                 |                        |           | 200                     |                             | FLB267 WT200 3                              | FLB225 TT200 3                                  |
|                 |                        |           | 225                     |                             | FLB267 WT225 3                              | FLB225 TT225 3                                  |

\*Formerly "KB"  
†Formerly "JB"

# EFD and EFDC Series Circuit Breakers and Enclosures

120VAC, Single Pole

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

3C

## Applications:

EFD circuit breakers and enclosures are used:

- For branch circuit protection for lighting, appliance, and motor circuits
- In areas made hazardous due to the presence of flammable vapors, gases or combustible dusts
- In corrosive locations
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnect means, short circuit protection and thermal time delay overload protection

## Features:

- Small, compact enclosures with accurately ground, wide flange on both body and cover for flamtight joint
- Dead-end (EFD) or through feed (EFDC) hubs  $\frac{3}{4}$ " to 1" sizes
- Breaker mounted on cover and back wired for ease of installation
- Breaker can be padlocked in "ON" or "OFF" positions with trip-free handle mechanism

## Certifications and Compliances:

- NEC:
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA 3, 7B\*CD, 9EFG, 12

## Standard Materials:

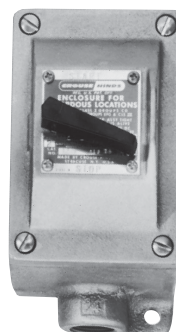
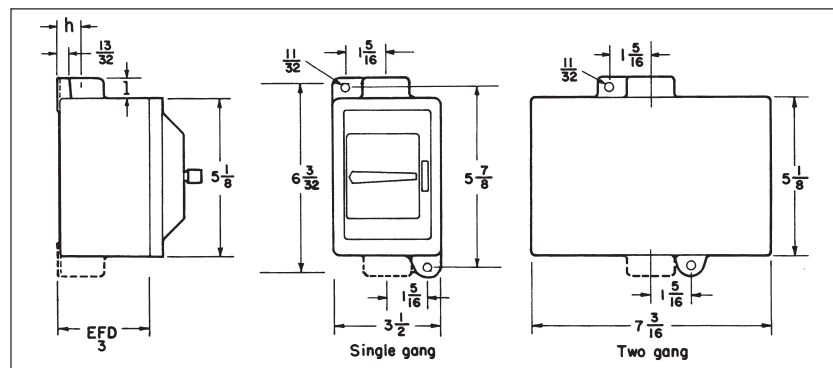
- Bodies and covers – *Feraloy*® iron alloy
- Operating handles – type 6 / 6 nylon
- Operating shafts – stainless steel

## Standard Finishes:

- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Type 6 / 6 nylon – black
- Stainless steel – natural

## Dimensions

In Inches†:



EFD dead end



EFDC through feed

## Electrical Ratings:

- Single pole – 120 / 240 VAC max.
- Trip ratings – 15, 20 and 30 amp.

## Options:

Description  
For use in Group B hazardous areas\*

Suffix  
GB

## Ordering Information

### With Square D Type "QOU" Circuit Breakers

| Hub Size in.                           | 15 Amp Cat. # | 20 Amp Cat. # | 30 Amp Cat. # |
|----------------------------------------|---------------|---------------|---------------|
| <b>EFD Single Gang (Dead End)</b>      |               |               |               |
| $\frac{3}{4}$                          | EFD21104      | EFD21105      | EFD21106      |
| 1                                      | EFD31104      | EFD31105      | EFD31106      |
| <b>EFDC Single Gang (Through Feed)</b> |               |               |               |
| $\frac{3}{4}$                          | EFDC21104     | EFDC21105     | EFDC21106     |
| 1                                      | EFDC31104     | EFDC31105     | EFDC31106     |
| <b>EFD Two Gang (Dead End)</b>         |               |               |               |
| $\frac{3}{4}$                          | EFD22104      | EFD22105      | EFD22106      |
| 1                                      | EFD32104      | EFD32105      | EFD32106      |
| <b>EFDC Two Gang (Through Feed)</b>    |               |               |               |
| $\frac{3}{4}$                          | EFDC22104     | EFDC22105     | EFDC22106     |
| 1                                      | EFDC32104     | EFDC32105     | EFDC32106     |

| Hub Size      | Dim. "h"      | Dim. "l"        |
|---------------|---------------|-----------------|
| $\frac{3}{4}$ | $\frac{7}{8}$ | $\frac{13}{16}$ |
| 1             | 1             | $\frac{15}{16}$ |

\*Seals must be installed within  $\frac{1}{2}$ " of each conduit opening, for Group B use.  
†Dimensions are approximate, not for construction purposes.

Crouse-Hinds

by E.T.N

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# NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Applications:

- NCB circuit breakers are for use in conjunction with a variety of heating, lighting and power circuits to provide disconnect means and short circuit protection.

## Features:

- Enclosures are made of *Krydon*®, Eaton's Crouse-Hinds' high impact strength fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat
- Unitized, strong and durable enclosure construction provides longer service life for equipment
- Enclosure has hinged access door which opens 160° for easy wiring and maintenance. Three screws for door frame are hidden behind access door
- Access door may be padlocked to prevent unauthorized access

## Certifications and Compliances:

- NEMA: 3, 4X and 12
- CSA Standard: C22.2 No. 94
- UL Standard: 489

## Electrical Rating Ranges:

- 100, 150, 225, 250 and 400 amp frames

## Options:

### Description

- Insulated, groundable type terminal block for grounded or ungrounded neutral can be supplied
- Hubs (see "Note on Hubs") – see listing on page 677
- Grounding plate or bushing – see listing on page 677

### Suffix

S618



Circuit breaker enclosure with built-in *Krydon* material handle

## Ordering Information

To order an enclosure complete with circuit breaker, insert the manufacturer's symbol in the designated position of the catalog number.

Enclosures only can be ordered. Select from listings.

| Circuit Breaker                              |                     |      | Enclosure                   |                                |
|----------------------------------------------|---------------------|------|-----------------------------|--------------------------------|
| Poles                                        | Voltage Rating      | Amps | With Circuit Breaker Cat. # | Without Circuit Breaker Cat. # |
| <b>100A Frame (Non-Interchangeable Trip)</b> |                     |      |                             |                                |
| 2                                            | 240 VAC/<br>250 VDC | 15   | NCB1018F ①15EB 22           | NCB1018F                       |
|                                              |                     | 20   | NCB1018F ①20EB 22           |                                |
|                                              |                     | 25   | NCB1018F ①25EB 22           |                                |
|                                              |                     | 30   | NCB1018F ①30EB 22           |                                |
|                                              |                     | 35   | NCB1018F ①35EB 22           |                                |
|                                              |                     | 40   | NCB1018F ①40EB 22           |                                |
|                                              |                     | 50   | NCB1018F ①50EB 22           |                                |
|                                              |                     | 60   | NCB1018F ①60EB 22           |                                |
|                                              |                     | 70   | NCB1018F ①70EB 22           |                                |
|                                              |                     | 80   | NCB1018F ①80EB 22           |                                |
|                                              |                     | 90   | NCB1018F ①90EB 22           |                                |
|                                              |                     | 100  | NCB1018F ①100EB 22          |                                |
| 2                                            | 480 VAC/<br>250 VDC | 15   | NCB1018F ①15EHB 24          | NCB1018F                       |
|                                              |                     | 20   | NCB1018F ①20EHB 24          |                                |
|                                              |                     | 25   | NCB1018F ①25EHB 24          |                                |
|                                              |                     | 30   | NCB1018F ①30EHB 24          |                                |
|                                              |                     | 35   | NCB1018F ①35EHB 24          |                                |
|                                              |                     | 40   | NCB1018F ①40EHB 24          |                                |
|                                              |                     | 50   | NCB1018F ①50EHB 24          |                                |
|                                              |                     | 60   | NCB1018F ①60EHB 24          |                                |
|                                              |                     | 70   | NCB1018F ①70EHB 24          |                                |
|                                              |                     | 80   | NCB1018F ①80EHB 24          |                                |
|                                              |                     | 90   | NCB1018F ①90EHB 24          |                                |
|                                              |                     | 100  | NCB1018F ①100EHB 24         |                                |

①Circuit Breakers:

### Frames

| Manufacturer     | Symbol | 100/ 150A |      |      |  | 225/<br>250A |  | 400A |  |
|------------------|--------|-----------|------|------|--|--------------|--|------|--|
|                  |        | 240V      | 480V | 600V |  | 600V         |  | 600V |  |
| General Electric | TT     | TEB       | TED† | TED† |  | TFJ          |  |      |  |
| Square D         | DT     | FAL†      | FAL† | FAL† |  | KAL          |  | LAL  |  |
| Cutler-Hammer    |        |           |      |      |  |              |  |      |  |
|                  | WT     | EB        | EHB, | FB,  |  | JB,          |  |      |  |
|                  |        |           | EHD  | FDB  |  | JDB          |  |      |  |

†Specify voltage.

**NOTE ON HUBS:** The following number and sizes of hubs (not mounted) are included when circuit breakers are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options")

| Circuit Breaker Frame | Ampere Rating | Number Included | Hub Size |
|-----------------------|---------------|-----------------|----------|
| EB, EHD*, FDB‡        | 15-50         | 2               | 1¼       |
| EB, EHD*, FDB‡        | 60-100        | 2               | 2        |
| JDB■                  | 110-225       | 2               | 2½       |
| KDB§                  | 250-400       | 2               | 3        |

\*Formerly EHB.  
‡Formerly FB.  
§Formerly LB.  
■Formerly JB.

**Crouse-Hinds**  
by **E.T.N.**

# NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

3C

| Circuit Breaker                                       |                     |      | Enclosure                   |                                |  |
|-------------------------------------------------------|---------------------|------|-----------------------------|--------------------------------|--|
| Poles                                                 | Voltage Rating      | Amps | With Circuit Breaker Cat. # | Without Circuit Breaker Cat. # |  |
| 100/150A Frame (Non-Interchangeable Trip) – continued |                     |      |                             |                                |  |
| 2†                                                    | 600 VAC/<br>250 VDC | 15   | NCB1018F ①15FB 26           | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20FB 26           |                                |  |
|                                                       |                     | 25   | NCB1018F ①25FB 26           |                                |  |
|                                                       |                     | 30   | NCB1018F ①30FB 26           |                                |  |
|                                                       |                     | 35   | NCB1018F ①35FB 26           |                                |  |
|                                                       |                     | 40   | NCB1018F ①40FB 26           |                                |  |
|                                                       |                     | 50   | NCB1018F ①50FB 26           |                                |  |
|                                                       |                     | 70   | NCB1018F ①70FB 26           |                                |  |
|                                                       |                     | 80   | NCB1018F ①80FB 26           |                                |  |
|                                                       |                     | 90   | NCB1018F ①90FB 26           |                                |  |
|                                                       |                     | 100  | NCB1018F ①100FB 26          |                                |  |
| 3                                                     | 240 VDC             | 15   | NCB1018F ①15EB 32           | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20EB 32           |                                |  |
|                                                       |                     | 25   | NCB1018F ①25EB 32           |                                |  |
|                                                       |                     | 30   | NCB1018F ①30EB 32           |                                |  |
|                                                       |                     | 35   | NCB1018F ①35EB 32           |                                |  |
|                                                       |                     | 40   | NCB1018F ①40EB 32           |                                |  |
|                                                       |                     | 50   | NCB1018F ①50EB 32           |                                |  |
|                                                       |                     | 70   | NCB1018F ①70EB 32           |                                |  |
|                                                       |                     | 80   | NCB1018F ①80EB 32           |                                |  |
|                                                       |                     | 90   | NCB1018F ①90EB 32           |                                |  |
|                                                       |                     | 100  | NCB1018F ①100EB 32          |                                |  |
| 3                                                     | 480 VAC             | 15   | NCB1018F ①15EHB 34          | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20EHB 34          |                                |  |
|                                                       |                     | 25   | NCB1018F ①25EHB 34          |                                |  |
|                                                       |                     | 30   | NCB1018F ①30EHB 34          |                                |  |
|                                                       |                     | 35   | NCB1018F ①35EHB 34          |                                |  |
|                                                       |                     | 40   | NCB1018F ①40EHB 34          |                                |  |
|                                                       |                     | 50   | NCB1018F ①50EHB 34          |                                |  |
|                                                       |                     | 70   | NCB1018F ①70EHB 34          |                                |  |
|                                                       |                     | 80   | NCB1018F ①80EHB 34          |                                |  |
|                                                       |                     | 90   | NCB1018F ①90EHB 34          |                                |  |
|                                                       |                     | 100  | NCB1018F ①100EHB 34         |                                |  |
| 3                                                     | 600 VAC             | 15   | NCB1018F ①15FB 36           | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20FB 36           |                                |  |
|                                                       |                     | 25   | NCB1018F ①25FB 36           |                                |  |
|                                                       |                     | 30   | NCB1018F ①30FB 36           |                                |  |
|                                                       |                     | 35   | NCB1018F ①35FB 36           |                                |  |
|                                                       |                     | 40   | NCB1018F ①40FB 36           |                                |  |
|                                                       |                     | 50   | NCB1018F ①50FB 36           |                                |  |
|                                                       |                     | 70   | NCB1018F ①70FB 36           |                                |  |
|                                                       |                     | 80   | NCB1018F ①80FB 36           |                                |  |
|                                                       |                     | 90   | NCB1018F ①90FB 36           |                                |  |
|                                                       |                     | 100  | NCB1018F ①100FB 36          |                                |  |

| Circuit Breaker                           |                     |      | Enclosure                   |                                |  |  |
|-------------------------------------------|---------------------|------|-----------------------------|--------------------------------|--|--|
| Poles                                     | Voltage Rating      | Amps | With Circuit Breaker Cat. # | Without Circuit Breaker Cat. # |  |  |
| 225/50A Frame (Non-Interchangeable Trip)§ |                     |      |                             |                                |  |  |
| 2                                         | 600 VAC/<br>250 VDC | 110  | NCB1024F ①110JB 26          | NCB1024F                       |  |  |
|                                           |                     | 125  | NCB1024F ①125JB 26          |                                |  |  |
|                                           |                     | 150  | NCB1024F ①150JB 26          |                                |  |  |
|                                           |                     | 175  | NCB1024F ①175JB 26          |                                |  |  |
|                                           |                     | 200  | NCB1024F ①200JB 26          |                                |  |  |
|                                           |                     | 225  | NCB1024F ①225JB 26          |                                |  |  |
| 3                                         | 600 VDC             | 110  | NCB1024F ①110JB 36          | NCB1024F                       |  |  |
|                                           |                     | 125  | NCB1024F ①125JB 36          |                                |  |  |
|                                           |                     | 150  | NCB1024F ①150JB 36          |                                |  |  |
|                                           |                     | 175  | NCB1024F ①175JB 36          |                                |  |  |
|                                           |                     | 200  | NCB1024F ①200JB 36          |                                |  |  |
|                                           |                     | 225  | NCB1024F ①225JB 36          |                                |  |  |
| 400A Frame (Interchangeable Trip)*        |                     |      |                             |                                |  |  |
| 2                                         | 600 VAC/<br>250 VDC | 250  | NCB1426F ①250LB 26          | NCB1426F                       |  |  |
|                                           |                     | 300  | NCB1426F ①300LB 26          |                                |  |  |
|                                           |                     | 350  | NCB1426F ①350LB 26          |                                |  |  |
|                                           |                     | 400  | NCB1426F ①400LB 26          |                                |  |  |
| 3                                         | 600 VAC             | 250  | NCB1426F ①250LB 36          | NCB1426F                       |  |  |
|                                           |                     | 300  | NCB1426F ①300LB 36          |                                |  |  |
|                                           |                     | 350  | NCB1426F ①350LB 36          |                                |  |  |
|                                           |                     | 400  | NCB1426F ①400LB 36          |                                |  |  |

①Circuit Breakers:

| Manufacturer     | Symbol | Frames               |             |            |                      |              |
|------------------|--------|----------------------|-------------|------------|----------------------|--------------|
|                  |        | 100/<br>150A<br>240V | 480V        | 600V       | 225/<br>250A<br>600V | 400A<br>600V |
| General Electric | TT     | TEB                  | TED†        | TED†       | TFJ                  |              |
| Square D         | DT     | FAL†                 | FAL†        | FAL†       | KAL                  | LAL          |
| Cutler-Hammer    | WT     | EB                   | EHB,<br>EHD | FB,<br>FDB | JB,<br>JDB           |              |

Note on Hubs: The following number and sizes of hubs (not mounted) are included when circuit breakers are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Circuit Breaker Frame | Ampere Rating | Number Included | Hub Size |
|-----------------------|---------------|-----------------|----------|
| EB, EHD◉, FDB▲        | 15–50         | 2               | 1¼       |
| EB, EHD◉, FDB▲        | 60–100        | 2               | 2        |
| JDB■                  | 110–225       | 2               | 2½       |

■Formerly JB  
◉Formerly EHB  
▲Formerly FB

†Specify voltage.  
‡2-pole, 600 VAC/250 VDC for Square D circuit breakers only.  
\*For Square D circuit breakers only.  
§Also available with interchangeable trip breakers. Specify on order.

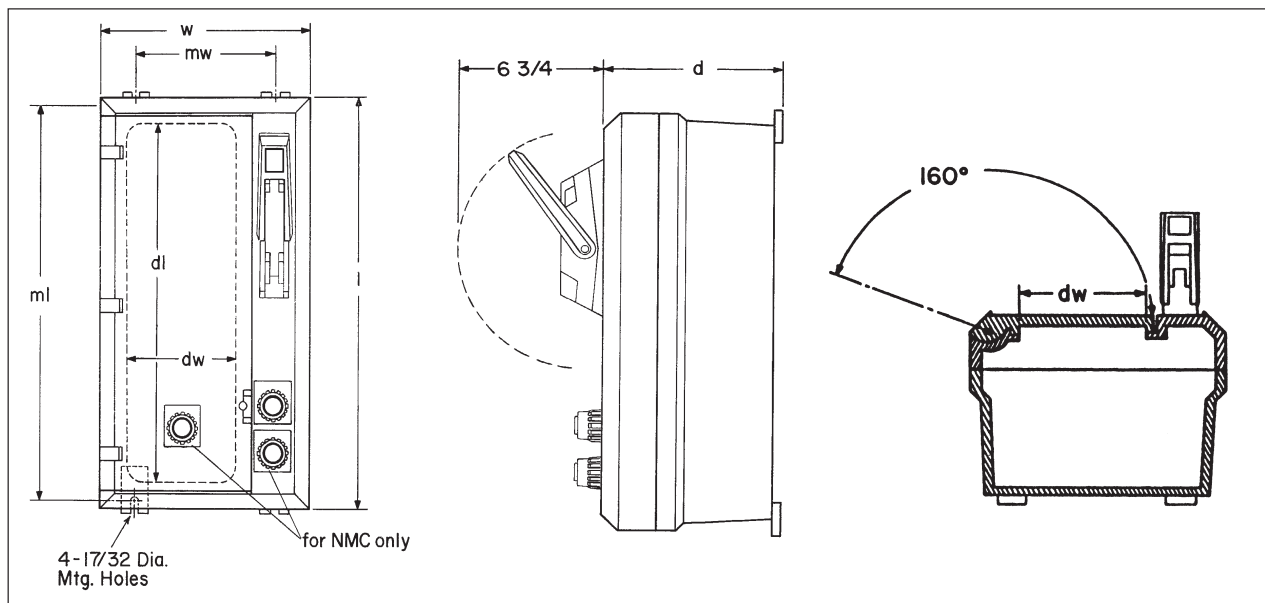


# 3C NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Dimensions In Inches\*



| Cat. #  | Outside Dimensions               |                                  | d                               | Mounting Dimensions            |                                | Door Opening Dimensions          |                                 |
|---------|----------------------------------|----------------------------------|---------------------------------|--------------------------------|--------------------------------|----------------------------------|---------------------------------|
|         | l                                | w                                |                                 | mw                             | ml                             | dl                               | dw                              |
| NCB1018 | 19 <sup>13</sup> / <sub>32</sub> | 11 <sup>13</sup> / <sub>32</sub> | 8 <sup>23</sup> / <sub>32</sub> | 7 <sup>7</sup> / <sub>8</sub>  | 19 <sup>9</sup> / <sub>8</sub> | 16 <sup>7</sup> / <sub>8</sub>   | 5 <sup>11</sup> / <sub>16</sub> |
| NCB1024 | 25 <sup>13</sup> / <sub>32</sub> | 11 <sup>13</sup> / <sub>32</sub> | 8 <sup>23</sup> / <sub>32</sub> | 7 <sup>7</sup> / <sub>8</sub>  | 25 <sup>9</sup> / <sub>8</sub> | 22 <sup>7</sup> / <sub>8</sub>   | 5 <sup>11</sup> / <sub>16</sub> |
| NCB1426 | 27 <sup>13</sup> / <sub>32</sub> | 15 <sup>13</sup> / <sub>32</sub> | 9 <sup>23</sup> / <sub>32</sub> | 11 <sup>7</sup> / <sub>8</sub> | 27 <sup>1</sup> / <sub>4</sub> | 23 <sup>11</sup> / <sub>16</sub> | 9 <sup>11</sup> / <sub>16</sub> |

\*Dimensions are approximate, not to be used for construction purposes.

| Description                                                             | Page No.          |
|-------------------------------------------------------------------------|-------------------|
| Application/Selection                                                   | see pages 512–513 |
| <b>EDS / EFS Series Control Stations</b>                                |                   |
| FlexStation™ Control Station Components                                 | see page 514      |
| EDSCM Modular Series Bodies                                             | see page 519      |
| DSD Cover and Device Sub-assemblies                                     | see page 521      |
| DSD-SR HP Rated Selector Switch                                         | see page 524      |
| <b>Fully Assembled EDS and EFS Control Stations</b>                     |                   |
| EDS Pushbutton Stations                                                 | see page 527      |
| EFS Pilot Light Stations                                                | see pages 530–531 |
| EDS Combination Pushbutton and Pilot Light Stations                     | see page 532      |
| EDS Selector Switches                                                   | see page 533      |
| EFS Selector Switches                                                   | see page 534      |
| EDS Snap Switches                                                       | see page 535      |
| EDS Manual Motor Starting Switches                                      | see pages 536–537 |
| EFS Fire Alarm Station                                                  | see page 538      |
| <b>EDS / EFS Control Stations Sub-assembly Reference Guide</b>          | see pages 539–540 |
| <b>MC / MCC Pushbutton, Selector Switch, and Pilot Light Stations</b>   | see page 541      |
| <b>N2S / N2SC Control Stations</b>                                      | see page 544      |
| <b>N2SU / N2SCU Control Stations</b>                                    | see page 551      |
| <b>N2FA / N2FAC Fire Alarm Control Stations</b>                         | see page 555      |
| <b>GHG43 Control Stations</b>                                           | see page 556      |
| <b>OAC Pushbutton Stations and Selector Switches</b>                    | see page 567      |
| <b>Control Station Covers</b>                                           | see page 570      |
| <b>Replacements for Pushbutton and Selector Switch Control Stations</b> | see page 571      |

### Application and Selection Quick Selector Chart

#### Applications:

Control stations are used as a remote means of:

- Motor control
- Visual indication of equipment performance
- On-off control of circuits
- Circuit selection

#### Considerations for Selection:

- The environment of the control station location and requirements for construction in terms of NEC/CEC compliances and NEMA/EEMAC type
- Function to be performed
- Desirability of factory sealing as compared to field sealing
- Factory sealing has distinct advantages:
  - Less installation problems
  - Less time consuming
  - Less change of error
  - Lower installed cost
  - Accommodates future changes to circuitry
  - Greater reliability
- The number of controls required, and the space available for installation. Where space is limited, panel or junction box mounting with many combinations are available
- See "Quick Selector Chart" for guidance

#### Options:

Many options are available on:

- Material and finishes where special atmospheric conditions prevail
- Special features for specific applications. See individual control station listings for available options

#### Quick Selector Chart

| Control Station                      | NEC/CEC – Hazardous Area Compliance                                                                                                     | NEMA/EEMAC Type               | Function                                     | Factory Sealed                                | No. of Devices or Units | Type of Mounting     | Cover Style  |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------|-----------------------------------------------|-------------------------|----------------------|--------------|
| MC, MCC                              |                                                                                                                                         | 3, 4                          | Pushbutton<br>Pilot light<br>Selector switch |                                               | 1-5*                    | Surface<br>1-5 gang  | Gasketed     |
| EDS, EDSC§                           | Cl. I, Div. 1, Groups C, D<br>Cl. I, Div. 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7B<br>(Div. 2) CD,<br>9EFG | Pilot light<br>Pushbutton<br>Selector switch | Pilot light<br>Pushbutton<br>Selector switch§ | 1-2*                    | Surface<br>1-2 gang  | Ground joint |
| DSD Covers and Device Sub-assemblies | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                           | 3, 7B,<br>9EFG                | Pilot light<br>Pushbutton<br>Selector switch | Pilot light<br>Pushbutton<br>Selector switch  | 1                       | Surface<br>1 gang    | Ground joint |
| DSD-SR                               | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                              | 3, 5, 7CD,<br>9EFG, 12        | Selector Switch                              |                                               | 1                       | Surface<br>1 gang    | Ground joint |
| EDSCM                                | Cl. I, Div. 1, Groups C, D<br>Cl. I, Div. 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7CD,<br>9EFG               | Pilot light<br>Pushbutton<br>Selector switch |                                               | 1-15*                   | Surface<br>1-15 gang | Ground joint |
| EF§§                                 | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                           | 3, 7BCD,<br>9EFG              | Pilot light<br>Pushbutton<br>Selector switch | Pilot light§<br>Pushbutton<br>Selector switch | 1-2*                    | Surface<br>1 gang    | Ground joint |

\*Number of devices per unit.

§Factory-sealed units.

## Application and Selection Quick Selector Chart

### Quick Selector Chart (continued)

| Control Station                | NEC/CEC – Hazardous Area Compliances                                                                                                                                                                                    | NEMA/EEMAC Type               | Function                                                                                    | Factory Sealed                                              | No. of Devices or Units | Type of Mounting    | Cover Style      |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------|---------------------|------------------|
| FlexStation                    | Cl. I, Div. 1, Groups C, D<br>Cl. I, Div. 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                                                                                 | 3, 7B<br>(Div. 2) CD,<br>9EFG | Pilot light<br>Pushbutton                                                                   | Pilot light<br>Pushbutton                                   | 1-2-3                   | Surface<br>1-2 gang | Ground joint     |
| GHG43                          | Cl. I, Div. 2, Groups A, B, C, D<br>Cl. I, Zones 1 and 2, (A)Ex de IIB + H2, T6<br>Cl. II, Div. 1, Groups E, F, G<br>PTB ATEX Certified 3117<br>CENELEC EEx de IIC, T6, Zones 1 and 2<br>Eex de IIC, T6 Zones 21 and 22 | 4X, IP66                      | Pushbutton<br>Signal Lamp<br>Potentiometer<br>Ammeter<br>Selector Switch<br>Terminal Blocks |                                                             | 1-4*                    | Surface<br>1 gang   | Screw and Gasket |
| N2FA,<br>N2FAC                 | Cl. I, Div. 2, Groups B, C, D                                                                                                                                                                                           | 3, 7BCD, 12                   | Fire Alarm                                                                                  | Pushbutton<br>Selector switch                               | 1                       | Surface<br>1 gang   | Screw and Gasket |
| N2S,<br>N2SC<br>N2SU,<br>N2SCU | Cl. I, Div. 2, Groups B, C, D                                                                                                                                                                                           | 3, 4X, 7BCD, 12               | Pilot light<br>Pushbutton<br>Selector switch<br>Combination                                 | Pilot light<br>Pushbutton<br>Selector switch<br>Combination | 1-4*                    | Surface<br>1 gang   | Screw and Gasket |
| OAC                            | Cl. I, Div. 1, Groups A, B, C, D<br>Cl. I, Div. 2, Groups A, B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                                                                        | 3, 7ABCD,<br>9EFG, 12         | Pushbutton<br>Selector switch                                                               | Pushbutton<br>Selector switch                               | 1-2*                    | Surface<br>1 gang   | Threaded         |

\*Number of devices per unit.

## EDS / EFS Series Control Stations

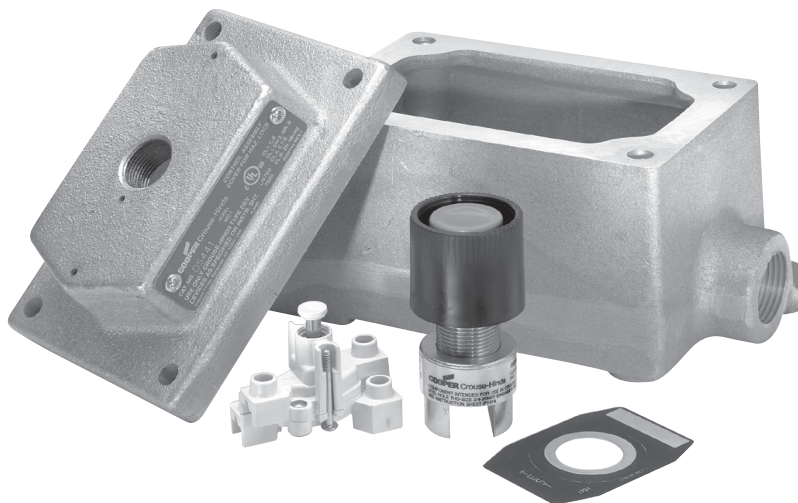
## FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

### Applications:

Five modular components – operators, contact blocks, covers, legend plates, and bodies – are combined to provide a variety of control stations which are:

- For use indoors or outdoors, in areas which are hazardous due to the presence of flammable gases and vapors, or combustible dust.
- Used in conjunction with magnetic starters or contactors for remote control of motors and other electrical apparatus.
- For installation in petroleum refineries, chemical, petrochemical, and other industrial process facilities; grain processing and storage facilities; and other heavy industrial applications where Class I, Class II, or Class III hazards are present.



### Features:

- Momentary contact pushbuttons, maintained contact pushbuttons, and pilots lights offer a choice of functions.
- Selector switches in 2 or 3 position configurations including keyed and spring return options.
- Single-hole, two-hole, and three-hole covers for one, two, or three devices respectively per station.
- Rugged control devices for safe, reliable operation in industrial applications.
- Bodies, with extra room for wire pulling and termination, also include two integral mounting feet for fast, secure installation.
- Bodies have  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", or 1" dead-end or through-feed conduit hubs with integral bushing for protection of wire insulation.
- Covers and bodies are available in *Feraloy*® or copper-free aluminum for light weight and corrosion resistance.
- DL legend plates have large lettering to give clear indication of device function. Space is available for field markings.

### Certifications and Compliances:

- NEC
  - Class I, Division 1 & 2, Groups B\* (Div. 2), C, D
  - Class II, Division 1 & 2, Groups E, F, G
  - Class III
- Zone 1 & 2 Group IIB\*
- NEMA: 3R, 7B (Div. 2) CD, 9EFG, 12
- UL Standard: 1203

### Standard Materials:

- Bodies, covers – *Feraloy*® or copper-free aluminum.
- Pushbuttons and guards – Type 6 / 6 nylon.
- Operating shafts, bearings – stainless steel.

### Standard Finishes:

- *Feraloy*® iron alloy – electrogalvanized and aluminum acrylic paint.
- Copper-free aluminum – natural.
- Stainless steel – natural.

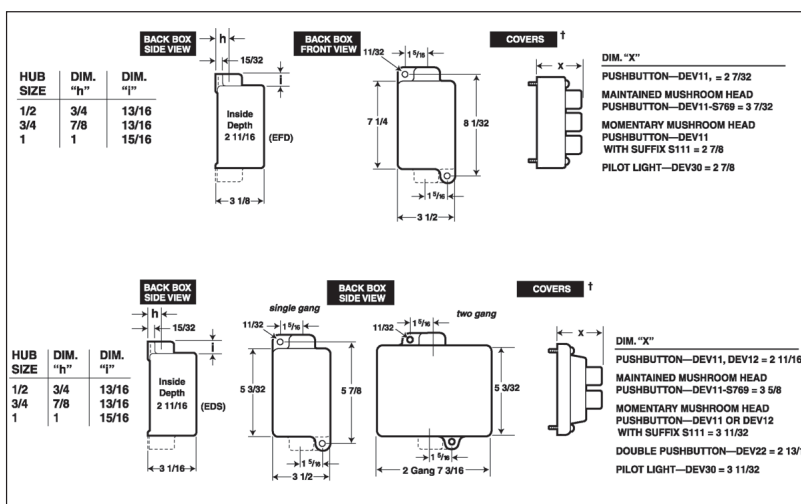
**Options:**

| Description                                                          | Suffix |
|----------------------------------------------------------------------|--------|
| Copper-free aluminum bodies and covers                               | SA     |
| Corro-free™ epoxy finish for use in severely corrosive environments. |        |
| FlexStation covers and bodies.                                       | S752   |

### Electrical Ratings:

- Pushbuttons and selector switches – 600 VAC heavy duty (NEMA A600).
- Pilot lights – 120 VAC.

### Dimensions In Inches:



†Covers have same length and width as back boxes.

\*For Class I, Division 1, Group B or Zone 1 Hydrogen applications, use the EFS(C) complete control station catalog numbers see page 528.

## Crouse-Hinds

# EDS / EFS Series Control Stations

## FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

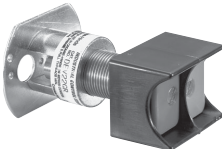
4C

### STEP 1 – Select Operator

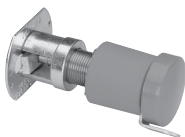
#### Pushbutton – front operated, standard black button



| Description                         | Cat. # |
|-------------------------------------|--------|
| Single button for 1 contact block   | DEV11  |
| Single button for 2 contact blocks  | DEV12  |
| Double buttons for 2 contact blocks | DEV22  |



| Options                                                                                                                      | Suffix |
|------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Specify color for each pushbutton button (ex: DEV11G, DEV22GR). Color is black if unspecified.</b>                        |        |
| Green button - unmarked                                                                                                      | G      |
| Red button - unmarked                                                                                                        | R      |
| Momentary red mushroom head style (not available with lockout or with DEV22)                                                 | S111   |
| Lockout with bar and chain (available on DEV11 and DEV12)                                                                    | S153   |
| Maintained red mushroom head style (lockout comes standard, do not specify S153; not available on DEV22) (Push to stop only) | S769   |



#### Pilot Light – factory sealed, incandescent lamp



| Description                               | Cat. #        |
|-------------------------------------------|---------------|
| Pilot light with red jewel                | DEV30 J1      |
| Pilot light with green jewel              | DEV30 J3      |
| Pilot light with amber jewel              | DEV30 J6      |
| Pilot light with clear jewel              | DEV30 J10     |
| Pilot light with blue LED and clear jewel | DEV30 J11 LED |

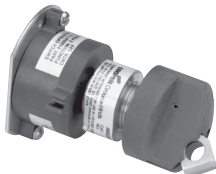


| Options                                            | Suffix |
|----------------------------------------------------|--------|
| LED lamps (standard clear jewel with colored lamp) | LED    |
| 24 V lamp (not available with transformer feature) | S300   |
| 240 / 120 V pilot light transformer                | T2     |
| 480 / 120 V pilot light transformer                | T4     |
| 600 / 120 V pilot light transformer                | T5     |

#### Selector Switch – with standard lockout



| Description                                                                                                                                                       | Cat. # |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 2-position (pos. 1 – N.O., pos. 2 – N.C.) for use with 1 or 2 contact blocks                                                                                      | DEV42  |
| 3-position (pos. 1 – N.O., pos. 2 – Open, pos. 3 – N.C.) for use with 1 or 2 contact blocks                                                                       | DEV43  |
| 3-position (pos. 1 – N.C., pos. 2 – N.O., pos. 3 – N.O. for Switch A)<br>(pos. 1 – N.O., pos. 2 – N.O., pos. 3 – N.C. for Switch B) for use with 2 contact blocks | DEV44  |



| Options                                                                                  | Suffix  |
|------------------------------------------------------------------------------------------|---------|
| Spring return to center from right (For DEV43 or DEV44 only)                             | S634    |
| Spring return to center from left (For DEV43 or DEV44 only)                              | S635    |
| Spring return to center from right and left (For DEV43 or DEV44 only)                    | S842    |
| Key Operated – removable from all positions                                              | S847 K1 |
| Key Operated – removable from left position for DEV42 or from center for DEV43 and DEV44 | S847 K2 |
| Key Operated – removable from right position for DEV42 or from left for DEV43 and DEV44  | S847 K3 |
| Key Operated – removable from right position for DEV43 and DEV44                         | S847 K4 |

### STEP 2 – Select Contact Block (if required). For product details see page 571.

#### Contact Block



| Description                                            | Cat. #  |
|--------------------------------------------------------|---------|
| Contact block, 1 NO and 1 NC, 10A, 600VAC, A600 rating | ESWP126 |

For additional technical information see page 571.

Note - Each control station will accept a maximum of three contact blocks. Select device operators accordingly. DEV12, DEV22 and DEV44 may not be used on a three-operator (DS443-SA) cover. DEV42 and DEV43 may not be used on a three-operator cover when using them with two contact blocks.

# EDS / EFS Series Control Stations

## FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

### STEP 3 – Select Desired Legend Plates

For use with single hole covers

| Cat. # | Inscription     |
|--------|-----------------|
| DL101  | Blank           |
| DL128  | Run-Jog         |
| DL129  | Hand-Auto       |
| DL130  | Forward-Reverse |
| DL132  | Open-Close      |
| DL133  | Up-Down         |
| DL135  | In-Out          |
| DL136  | Raise-Lower     |
| DL137  | Start-Stop      |
| DL138  | Run-Off-Jog     |
| DL139  | Hand-Off-Auto   |
| DL140  | For-Off-Rev     |
| DL141  | Fast-Off-Slow   |
| DL142  | 1-Off-2         |
| DL143  | Open-Off-Close  |
| DL144  | Up-Off-Down     |
| DL148  | Off-On          |
| DL149  | Auto-Off-Hand   |
| DL165  | Slow-Fast       |
| DL186  | Safe-Run        |
| DL187  | Raise-Off-Lower |
| DL188  | Slow-Off-Fast   |
| DL189  | Odd-Off-Even    |
| DL190  | Stop-Start      |
| DL191  | On-Off          |
| DL192  | Fast-Slow       |
| DL193  | Local-Remote    |
| DL194  | Trip-Reset      |
| DL195  | Auto-Manual     |
| DL196  | Start-Emer Stop |
| DL197  | Alarm-Silence   |
| DL198  | Maint-Manual    |
| DL199  | Test-Reset      |

For use with 2 or 3 hole covers

| Cat. # | Inscription          | Cat. # | Inscription     |
|--------|----------------------|--------|-----------------|
| DL01   | Blank w/no fields    | DL32   | Open-Close      |
| DL02   | Blank w/single field | DL33   | Up-Down         |
| DL03   | Blank w/2 fields     | DL35   | In-Out          |
| DL05   | Start                | DL36   | Raise-Lower     |
| DL06   | Stop                 | DL37   | Start-Stop      |
| DL07   | On                   | DL38   | Run-Off-Jog     |
| DL08   | Off                  | DL39   | Hand-Off-Auto   |
| DL09   | Run                  | DL40   | For-Off-Rev     |
| DL10   | Jog                  | DL41   | Fast-Off-Slow   |
| DL11   | Trip                 | DL42   | 1-Off-2         |
| DL12   | Reset                | DL43   | Open-Off-Close  |
| DL13   | Test                 | DL44   | Up-Off-Down     |
| DL14   | Power On             | DL46   | Fast            |
| DL15   | Hand                 | DL47   | Slow            |
| DL16   | Automatic            | DL48   | Off-On          |
| DL17   | Emer Stop            | DL49   | Auto-Off-Hand   |
| DL18   | Forward              | DL65   | Slow-Fast       |
| DL19   | Reverse              | DL85   | Safe            |
| DL20   | Open                 | DL86   | Safe-Run        |
| DL21   | Close                | DL87   | Raise-Off-Lower |
| DL22   | Up                   | DL88   | Slow-Off-Fast   |
| DL23   | Down                 | DL89   | Odd-Off-Even    |
| DL24   | In                   | DL90   | Stop-Start      |
| DL25   | Out                  | DL91   | On-Off          |
| DL26   | Raise                | DL92   | Fast-Slow       |
| DL27   | Lower                | DL93   | Local-Remote    |
| DL28   | Run-Jog              | DL94   | Trip-Reset      |
| DL29   | Hand-Auto            | DL95   | Auto-Manual     |
| DL30   | Forward-Reverse      | DL96   | Start-Emer Stop |
|        |                      | DL97   | Alarm-Silence   |
|        |                      | DL98   | Maint-Manual    |
|        |                      | DL99   | Test-Reset      |

Note: For special markings order DL101-"desired markings" or DL01-"desired markings"

### STEP 4 – Select Cover Covers



| Description                                                                                       | Cat. #   |
|---------------------------------------------------------------------------------------------------|----------|
| Blank cover with single hole (Single gang)                                                        | DS441    |
| Blank cover with 2 holes (Single gang)                                                            | DS442    |
| Blank cover with 3 holes (To be used with EFD(C)1491-SA, 2491-SA or 3491-SA series of back boxes) | DS443 SA |
| Replacement cover plug for unused device operator openings                                        | 206765   |



| Options:                                                                                       | Suffix |
|------------------------------------------------------------------------------------------------|--------|
| Aluminum body (mandatory suffix on DS443 must be included in catalog number)                   | SA     |
| Exterior epoxy powder coat finish                                                              | S752   |
| Interior & exterior epoxy powder coat finish. Not available on three operator cover (DS443-SA) | S753   |



# EDS / EFS Series Control Stations

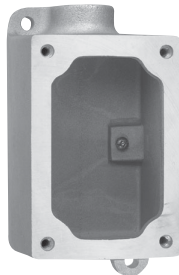
## FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

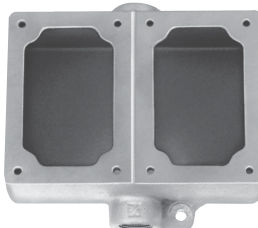
**4C**

### STEP 5 – Select Back Box

Back Boxes - for use with DS441 and DS442 covers or with 1 gang and 2 gang DS/DSD Series covers



| Dead End | Through Feed | Hub Size | Back Box Arrangement |
|----------|--------------|----------|----------------------|
| EDS171   | EDSC171      | 1/2"     | Single gang back box |
| EDS271   | EDSC271      | 3/4"     | Single gang back box |
| EDS371   | EDSC371      | 1"       | Single gang back box |
| EFS172   | EFSC172      | 1/2"     | Double gang back box |
| EFS272   | EFSC272      | 3/4"     | Double gang back box |
| EFS372   | EFSC372      | 1"       | Double gang back box |



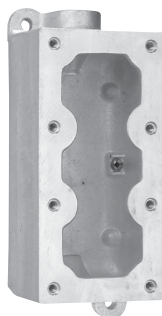
#### Options:

Aluminum body  
Exterior epoxy powder coat finish  
Interior & exterior epoxy powder coat finish

#### Suffix

SA  
S752  
S753

Back Boxes – for use with DS443-SA cover or with 1½ gang DS511 (3-operator) Series covers



| Dead End   | Through Feed | Hub Size | Back Box Arrangement |
|------------|--------------|----------|----------------------|
| EFD1491 SA | EFDC1491 SA  | 1/2"     | 1½ gang back box     |
| EFD2491 SA | EFDC2491 SA  | 3/4"     | 1½ gang back box     |
| EFD3491 SA | EFDC3491 SA  | 1"       | 1½ gang back box     |

#### Options

Exterior epoxy powder coat finish  
Interior & exterior epoxy powder coat finish

#### Suffix

S752  
S753

4C

## EDS / EFS Series Control Stations

### FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

#### Back Boxes – for use with DS441 and DS442 covers



| Through Feed            | Hub Size                                | Back Box Arrangement |
|-------------------------|-----------------------------------------|----------------------|
| EDSC378                 | 1"                                      | 3 gang tandem        |
| Common Cover Assemblies |                                         |                      |
| Cat. #                  | Description                             |                      |
| DS455 ①                 | With one pilot light                    |                      |
| DS476 ① ②               | With one pilot light and transformer    |                      |
| DS456 ① ①               | With two pilot lights                   |                      |
| DS429§                  | With one pushbutton                     |                      |
| DS454§                  | With two pushbuttons                    |                      |
| DS510 ①§                | With one pushbutton and one pilot light |                      |

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

②Add suffix below for transformer primary voltage:

#### Transformers – Voltages above 125

| Nom. Volts 50–60Hz Transformer | Primary Voltage Range | Suffix |
|--------------------------------|-----------------------|--------|
| 220 / 110                      | 220–240               | T2     |
| 440 / 110                      | 440–480               | T4     |
| 550 / 110                      | 550–600               | T5     |

§ If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

# EDS / EFS Series Control Stations

## EDSCM Modular Multi-Gang Control Device Bodies

Cl. I, Div. 1, Groups C, D\*  
Cl. I, Div. 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B (Div. 2) CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

**4C**

For use with DSD device cover sub-assemblies see page 521.

### Applications:

Modular control device bodies are for surface mounting combinations of control device equipment for use in:

- Industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas where atmospheres may contain hazardous gases or dusts, and arcing of enclosed devices must not ignite the surrounding atmosphere.
- Conjunction with magnetic starters or contactors for remote control and monitoring motors.
- Manual starting and stopping of small AC or DC motors.
- Controlling and supplying energy to portable electrical devices such as motor generator sets, compressors, conveyors, portable tools, etc.

### Features:

EDSCM Modular Control Stations have many distinct advantages over multiple individual units:

- Reduce installation costs. A multi-gang device assembly can be installed in less time than several single-gang units.
- Seals not required between gangs.
- Improved appearance. No exposed conduit runs between devices.
- Lightweight. Fifteen-gang aluminum device body can be installed by one person.
- Mounting feet are provided on the top and bottom of every gang to facilitate installation.
- Two and three gang tandem bodies have 1 1/4" through feed inward horizontal hubs and 1" or 2" vertical through feed hubs. Pipe plugs are installed in one horizontal hub and both vertical hubs.
- Single-gang device bodies have 1" through feed inward horizontal hubs and 3/4" through feed vertical hubs. Pipe plugs are installed in one horizontal hub and both vertical hubs.
- All hubs are taper tapped and have integral bushings.
- Close nipples, which are used to join two or more device bodies together, are furnished with EDSCM 21, 32, 33, 62 and 63 units.
- Any combination of bodies can be joined together horizontally.

### Certifications and Compliances:

(When used with DSD device sub-assemblies)\*:

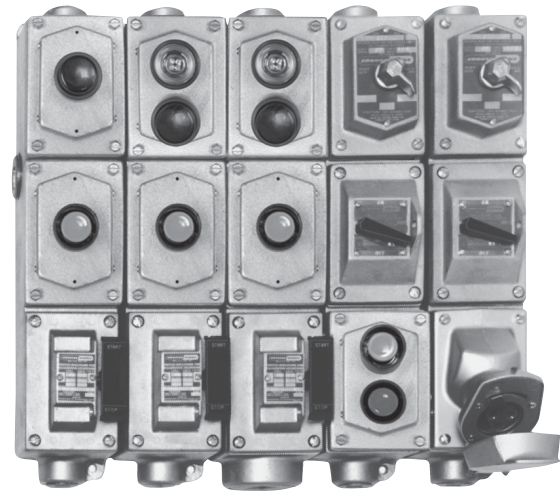
- Class I, Division 1 & 2, Groups C, D
- Class I, Division 2, Group B, C, D
- Class II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- NEMA/EEMAC: 3, 7B (Div.2) CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

### Standard Materials:

- Copper-free aluminum

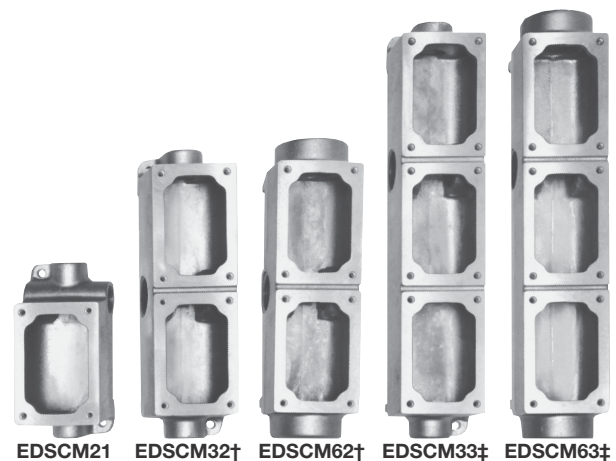
### Finish:

- Natural



**4C**

### Ordering Information



| Description       | Through Feed Hub Size | Cat. #  |
|-------------------|-----------------------|---------|
| Single Gang       | 3/4"                  | EDSCM21 |
| Tandem Two Gang   | 1"                    | EDSCM32 |
| Tandem Two Gang   | 2"                    | EDSCM62 |
| Tandem Three Gang | 1"                    | EDSCM33 |
| Tandem Three Gang | 2"                    | EDSCM63 |

\* When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.

† EDSCM32 and EDSCM62 will not accept covers with S697 or S701 suffixes.

‡ Bottom gang opening will accept covers with S697 or S701 suffixes.

In Class I areas all conduit runs entering bodies must be sealed. As many as five bodies can be joined horizontally without an intervening seal.

4C

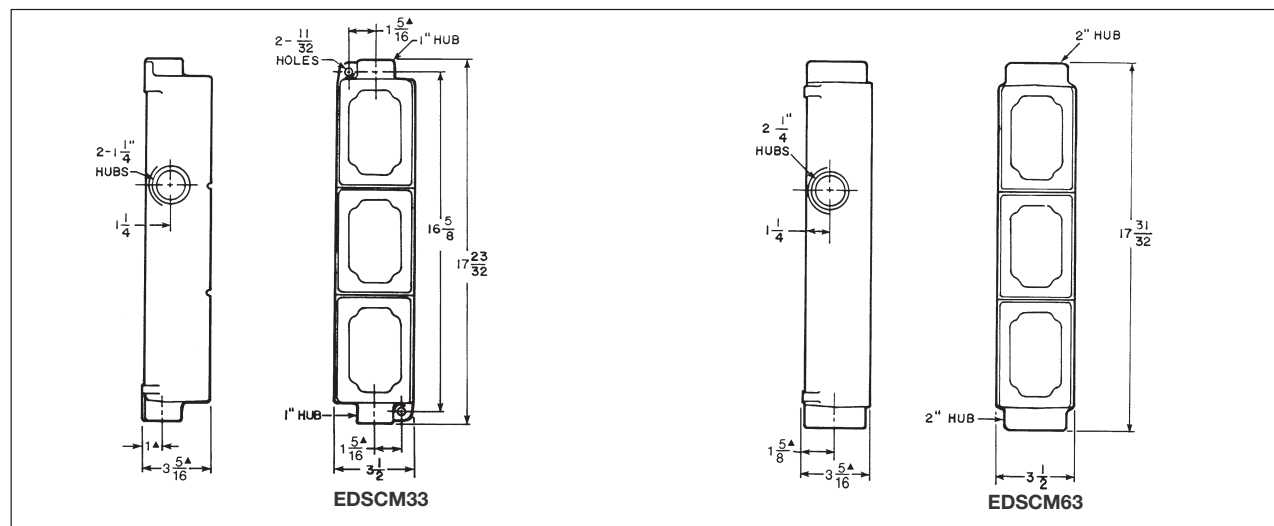
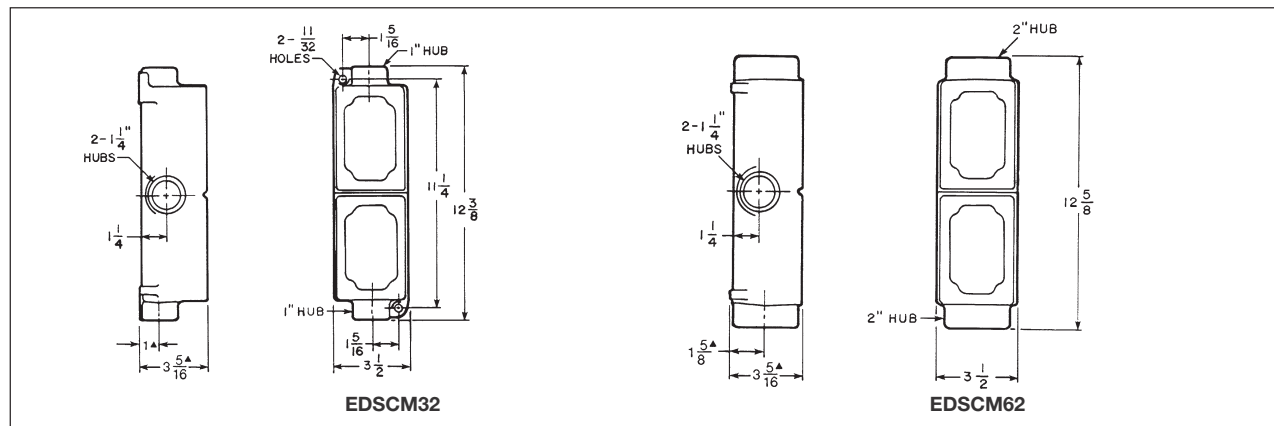
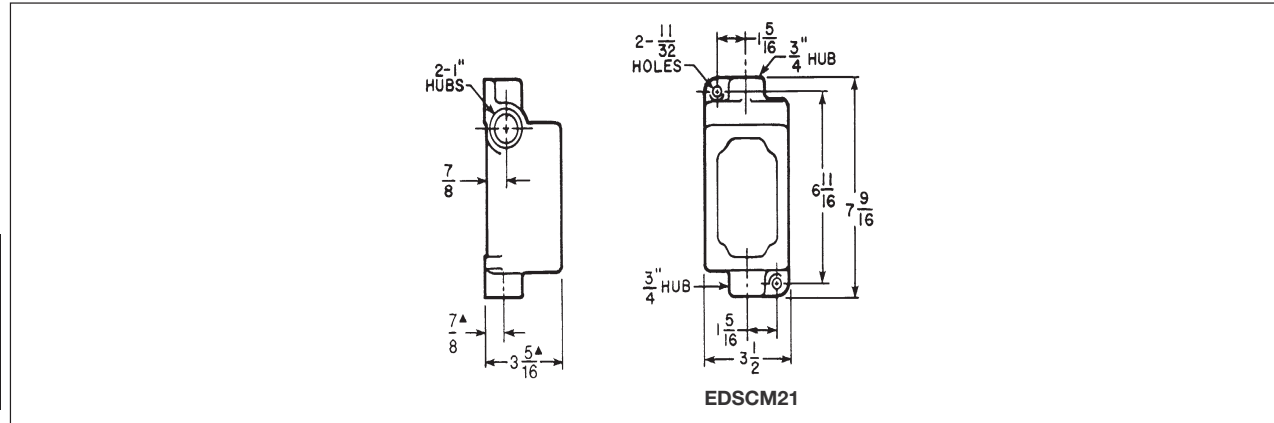
# EDS / EFS Series Control Stations

## EDSCM Modular Multi-Gang Control Device Bodies

Cl. I, Div. 1, Groups C, D\*  
Cl. I, Div. 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B (Div. 2) CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

### Dimensions In Inches:



\* When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.  
Dimensions are approximate. Not for construction purposes.

# EDS / EFS Series Control Stations

## DSD Cover and Device Sub-assemblies

Cl. I, Div. 1 & 2, Groups B\*, C, D†  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C

For use with EDSCM modular control device bodies see page 519 and EDS/EDSC back boxes.

### Features:

- Large machine screws for fastening covers to bodies
- Lockout hole for padlock having 1/4" hasp is provided when used with covers for front lever and side rocker type operation
- Lockout provisions on front operated pushbutton (marked "STOP" and "OFF") and all selector switch covers
- For covers with front lever and side rocker type operating handles, threaded type shafts and bushings are used to ensure flamtightness
- Accurately ground flange for flamtight joint when mated with ground flange on back box

### Certifications and Compliances:

(When used with EDSCM & EDS bodies):

- NEC/CEC:
  - Class I, Division 1 & 2, Groups C, D†
  - Class I, Division 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7B (Div. 2) CD, 9EFG
- UL Standards: 894, 698
- CSA Standard: C22.2 No. 30

Pushbuttons, Pilot Lights & Selector Switches (when used with EFS bodies):

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7BCD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

### Standard Materials:

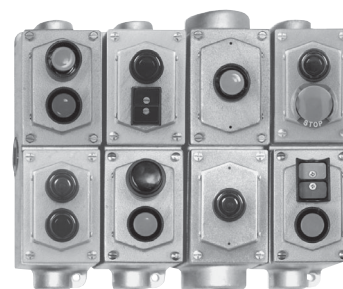
- Covers, front operated – *Feraloy* iron alloy and copper-free aluminum
- Covers, side operated – copper-free aluminum
- Shafts and shaft bushings – stainless steel
- Rocker handles, pushbuttons and guards – type 6 / 6 nylon
- Sealing enclosures – copper-free aluminum

CPS delayed action receptacle cover:

- Receptacle housing – copper-free aluminum
- Insulation – diallyl phthalate (DAP)
- Contacts – brass

### Standard Finishes:

- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural



### Options:

The following special options are available by adding suffix to Cat. #:

| Description                                                                                                                                                                        | Suffix  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| • Lockout provision on front operated pushbutton cover (standard on buttons marked "STOP" and "OFF").....                                                                          | S153    |
| • Three-position selector switches with modified operation:<br>Momentary contact clockwise operation, spring return to center, maintained contact counter-clockwise operation..... | S634    |
| • Momentary contact counter-clockwise operation, spring return to center, maintained contact clockwise operation.....                                                              | S635    |
| • Emergency "STOP" button momentary – front operated mushroom button breaks normally closed contacts (DL02 legend plate included - must specify legend text)                       | S111    |
| • Bodies and covers – copper-free aluminum.....                                                                                                                                    | SA      |
| • For 24 VDC operation on pilot lights.....                                                                                                                                        | S300    |
| • Maintained contact mushroom head with lockout and guard (Will not fit with a pilot light if transformer is required) (Push to stop only).....                                    | S769    |
| • Spring return to center from right and left (For DEV43 or DEV44 only).....                                                                                                       | S842    |
| • Key Operated – removable from all positions.....                                                                                                                                 | S847 K1 |
| • Key Operated – removable from left position for DEV42 or from center for DEV43 and DEV44.....                                                                                    | S847 K2 |
| • Key Operated – removable from right position for DEV42 or from left for DEV43 and DEV44.....                                                                                     | S847 K3 |
| • Key Operated – removable from right position for DEV43 and DEV44.....                                                                                                            | S847 K4 |

### Ordering Information Manual Motor Starters

| Poles                                           | Max. H.P. | Max. Volts A.C. | Cat. #     |
|-------------------------------------------------|-----------|-----------------|------------|
| <b>With Allen-Bradley Bulletin 600 Switches</b> |           |                 |            |
| 1                                               | 1         | 115–230         | DSD910 ①   |
| 2                                               | 1         | 115–230         | DSD911 ①   |
| <b>With General Electric Switches</b>           |           |                 |            |
| 1                                               | 1         | 115–230         | DSD912 ①\$ |
| 2                                               | 1         | 115–230         | DSD913 ①\$ |
| <b>With Cutler-Hammer Switches</b>              |           |                 |            |
| 1                                               | 1         | 115–230         | DSD914 ①\$ |
| 2                                               | 1         | 115–230         | DSD915 ①\$ |
| <b>With Arrow-Hart Switches</b>                 |           |                 |            |
| <b>Without Overload Protection</b>              |           |                 |            |
| 2                                               | 5         | 250 (30A)       | DSD916     |
| 2                                               | 7.5       | 600 (30A)       | DSD916     |
| 3                                               | 7.5       | 250 (30A)       | DSD917     |
| 3                                               | 15        | 600 (20A)       | DSD917     |



† When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.

\* For pushbuttons, pilot lights, & selector switches, use EFS back box with required external conduit seal for 1 inch hub size, within 5 feet for Class I, Division 1, Group B applications.

\$ A comparable factory sealed cover will fit on the EDSCM21 body, EDS and EDSC bodies and in bottom gang of EDSCM33 and EDSCM63 bodies. To order, add suffix S701 to catalog number.

① Includes one interchangeable heater. To select heater see pages 479–480. Symbol 0 (zero) may be used to indicate heater omitted.

## Crouse-Hinds

by **E.T.N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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4C

## EDS / EFS Series Control Stations

### DSD Cover and Device Sub-Assemblies

Cl. I, Div. 1 & 2, Groups B\*, C, D†  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

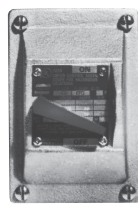
Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations



DSD918



DSD922



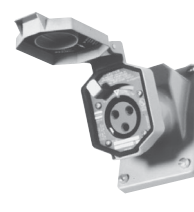
DSD933



DSD962



DSD970



CPS152R



ENR5201

For use with EDSCM modular control device bodies see page 519 & EFS/EDS back boxes.

### Ordering Information

#### Front Operated Pushbutton Stations 600 VAC Heavy Duty, Factory Sealed

| Number of<br>Cover Buttons | Normal<br>Position                                                            | Diagram | Cat. #       |
|----------------------------|-------------------------------------------------------------------------------|---------|--------------|
| 1                          | 1 Circuit<br>Universal                                                        |         | DSD918 ①     |
| 1                          | 2 Circuits<br>Universal                                                       |         | DSD919 ①     |
|                            | 2 Circuits                                                                    |         | DSD920 ①■    |
| 2                          | 2 Circuits<br>Universal                                                       |         | DSD921 ①     |
| 2                          | 2 Circuits<br>Start-Stop<br>unless<br>otherwise<br>specified                  |         | DSD922 ①■    |
| 2                          | 2 Circuits<br>Universal<br>Mushroom Head                                      |         | DSD970 ①     |
| 3 (2-operator)             | 3 Circuits<br>Universal                                                       |         | DSD962 ①     |
| 3 (3-operator)             | 3 Circuits<br>Universal                                                       |         | DS511 ① SA\$ |
| 3 (3-operator)             | 3 Circuits<br>Universal<br>Double pilot light -<br>single pushbutton<br>combo |         | DS513 ① SA\$ |
| 3 (3-operator)             | 3 Circuits<br>Universal<br>Double pushbutton -<br>single pilot light<br>combo |         | DS514 ① SA\$ |

#### Front Operated General Use Snap Switch

| Style  | Amperes<br>120 VAC | 277 VAC | Cat. #  |
|--------|--------------------|---------|---------|
| 1-Pole | 20                 | 20      | DSD933‡ |
| 2-Pole | 20                 | 20      | DSD934‡ |
| 3-Pole | ▲                  | ▲       | DSD935Ⓢ |
| 3-Way  | 20                 | 20      | DSD936‡ |
| 4-Way  | 20                 | 20      | DSD937‡ |
| 1-Pole | 30                 | 30      | DSD939‡ |
| 2-Pole | 30                 | 30      | DSD940‡ |
| 3-Way  | 30                 | 30      | DSD941‡ |

#### Delayed Action Receptacles Factory Sealed

| Rating                                                             | Cat. #                      |
|--------------------------------------------------------------------|-----------------------------|
| 20 A, 1 HP, 125–250 VAC 60 Hertz<br>20 A, 18 VDC                   | CPS152R<br>(2 wire, 3 pole) |
| 30 A, 1½ HP, 125–250 VAC 60 Hertz;<br>7 A, ½ HP, 480 VAC, 60 Hertz | CPS532R<br>(2 wire, 3 pole) |
| 30 A, 3 HP, 125–250 VAC 60 Hertz;<br>7A, 1 HP, 480 VAC, 60 Hertz   | CPS732R<br>(3 wire, 4 pole) |

#### General Purpose, Dead Front Factory Sealed

| Rating        | Cat. #  | Diagram |
|---------------|---------|---------|
| 20 A, 125 VAC | ENR5201 | 5-20R   |
| 20 A, 250 VAC | ENR6202 | 6-20R   |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

\* For pushbuttons, pilot lights, & selector switches, use EFS back box with required external conduit seal for 1 inch hub size, within 5 feet for Class I, Division 1, Group B applications.

† When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.

■ Two universal contact blocks, must be wired as two circuits with one normally open and one normally closed. 1 green button, 1 red button, and lockout provision provided as standard.

▲ 16 Amp., 125V.

10 Amp., 250V.

‡ To order a comparable factory sealed cover for EDS, EDSC, EDSCM21 and the bottom gang of EDSCM33 and EDSCM63 bodies, add suffix S697. Factory sealed for Class I, Division 2, Group B.

Ⓢ Cannot be factory sealed.

\$ Can only be used with EFD Series 1½ gang back boxes. Pushbuttons include contact blocks. Standard pushbutton color is black. For optional colors - red, green - write in color. Example: DS511 GREEN BLACK RED-SA. First color is for uppermost button. For optional legend markings write in marking after device operator color. Example: DS513-J3 JOG-J1 STOP GREEN-SA.

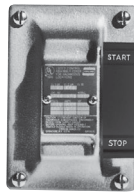
# EDS / EFS Series Control Stations

## DSD Cover and Device Sub-Assemblies

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C



DSD951



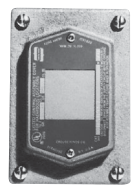
DSD925



DSD947-J1-J1



DSD958



DSD957



DSD961-J1

For use with EDS/SCM modular control device bodies see page 519 & EFS/EDS back boxes.

## Ordering Information Side Operated Pushbutton Station 600 VAC Heavy Duty, Factory Sealed

| Normal Position                                                                      | Diagram | Cat. #   |
|--------------------------------------------------------------------------------------|---------|----------|
| 1 Circuit Universal                                                                  |         | DSD949 ③ |
| 2 Circuits Universal                                                                 |         | DSD950 ③ |
| 2 Circuits<br>1 Open - A<br>1 Closed - B<br>Start-Stop unless<br>otherwise specified |         | DSD951 ③ |

## Selector Switches

### Maintained Contact 600 VAC Heavy Duty, Factory Sealed

|                   | Style | Position 1 | Position 2 | Position 3 | Cat. #   |
|-------------------|-------|------------|------------|------------|----------|
| Two<br>Circuit    | Two   | A1         | A2         |            | DSD923 ④ |
|                   | Four  | A1         | A2         |            |          |
| Two<br>Position   | Four  | A1         | A2         |            | DSD924 ④ |
|                   | Four  | B1         | B2         |            |          |
| Three<br>Circuit  | Two   | A1         | A2         |            | DSD925 ④ |
|                   | Four  | A1         | A2         |            |          |
| Three<br>Position | Four  | A1         | A2         |            | DSD926 ④ |
|                   | Four  | B1         | B2         |            |          |
| Four<br>Circuit   | Two   | A1         | A2         |            | DSD927 ④ |
|                   | Four  | A1         | A2         |            |          |

\* For pushbuttons, pilot lights, & selector switches, use EFS back box with required external conduit seal for 1 inch hub size, within 5 feet for Class I, Division 1, Group B applications. ‡LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED to Cat. No. after last color symbol.

§ Can only be used with EFD Series 1½ gang back boxes. Pushbuttons include contact blocks. Standard pushbutton color is black. For optional colors - red, green - write in color. Example: DS511 GREEN BLACK RED-SA. First color is for uppermost button. For optional legend markings write in marking after device operator color. Example: DS513-J3 JOG-J1 STOP GREEN-SA.

## Crouse-Hinds

by E.T.N

## Pilot Light Devices‡

### Factory Sealed

| Description                                                                                                                                                   | Diagram              | Cat. #      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------|
| With one pilot light                                                                                                                                          |                      | DSD948 ①    |
| With two pilot lights (Not available with a transformer)                                                                                                      |                      | DSD947 ①    |
| With one pilot light and transformer                                                                                                                          |                      | DSD948 ① ②  |
| With one pilot light and pushbutton station                                                                                                                   |                      | DSD958 ①    |
| With one pilot light and 1 double pushbutton station                                                                                                          |                      | DSD961 ①    |
| With one pilot light & transformer and 1 double pushbutton station                                                                                            |                      | DSD961 ① ②  |
| Triple pilot light                                                                                                                                            |                      | DS512 ① SA§ |
| Double pilot light - single pushbutton combo                                                                                                                  |                      | DS513 ① SA§ |
| Double pushbutton - single pilot light combo                                                                                                                  |                      | DS514 ① SA§ |
| 2 position selector switch, two circuit (pos. 1 - N.O., pos. 2 - N.C.)                                                                                        | A1<br>A2             | DSD973 ① ④  |
| 2 position selector switch, four circuit (pos. 1 - N.O., pos. 2 - N.C. for both switches)                                                                     | A1<br>A2<br>B1<br>B2 | DSD974 ① ④  |
| 3 position selector switch, two circuit (pos. 1 - N.O., pos. 2 - open, pos. 3 - N.C.)                                                                         | A1<br>A2             | DSD975 ① ④  |
| 3 position selector switch, four circuit (pos. 1 - N.O., pos. 2 - open, pos. 3 - N.C. for both switches)                                                      | A1<br>A2<br>B1<br>B2 | DSD976 ① ④  |
| 3 position selector switch, four circuit (pos. 1 - N.C., pos. 2 - N.O., pos. 3 - N.O. for switch A; pos. 1 - N.O., pos. 2 - N.O., pos. 3 - N.C. for switch B) | A1<br>A2<br>B1<br>B2 | DSD977 ① ④  |

## Blank Cover

| Description | Cat. # |
|-------------|--------|
|-------------|--------|

Blank Cover DSD957

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

②Add suffix below for transformer primary voltage:

### Transformers – Voltages above 125

| Nom. Volts 50–60Hz Transformer | Primary Voltage Range | Suffix |
|--------------------------------|-----------------------|--------|
| 220 / 110                      | 220–240               | T2     |
| 440 / 110                      | 440–480               | T4     |
| 550 / 110                      | 550–600               | T5     |

③ If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

④ Specify indicating plate markings. Standard indicating plate markings available are as follows:

### Two-Position

|                  |             |              |
|------------------|-------------|--------------|
| RUN, JOG         | FAST, SLOW  | IN, OUT      |
| HAND, AUTOMATIC  | OPEN, CLOSE | RAISE, LOWER |
| FORWARD, REVERSE | UP, DOWN    | START, STOP  |
|                  | ON, OFF     |              |

### Three-Position

|                       |                  |
|-----------------------|------------------|
| JOG, OFF, RUN         | 1, OFF, 2        |
| AUTOMATIC, OFF, HAND  | OPEN, OFF, CLOSE |
| FORWARD, OFF, REVERSE | UP, OFF, DOWN    |
| FAST, OFF, SLOW       |                  |



4C

## EDS / EFS Series Control Stations

**DSD-SR Series Horsepower Rated Selector Switch\***  
**30 A, 600 V; Front Operated**

Cl. I, Groups C & D  
Cl. II, Groups E, F & G  
Cl. III  
Enclosure 3, 5 & 12

### Ordering Information

| Switch Function                                                       | Cat. #      | Number of Poles | Number of Positions | Connecting Diagram |
|-----------------------------------------------------------------------|-------------|-----------------|---------------------|--------------------|
| ON/OFF                                                                | DSD SR30120 | 1               | 2                   |                    |
|                                                                       | DSD SR30220 | 2               | 2                   |                    |
|                                                                       | DSD SR30320 | 3               | 2                   |                    |
|                                                                       | DSD SR30420 | 4               | 2                   |                    |
|                                                                       | DSD SR30520 | 5               | 2                   |                    |
|                                                                       | DSD SR30620 | 6               | 2                   |                    |
|                                                                       |             |                 |                     | 1-6 Pole           |
| DOUBLE-THROW<br>without OFF                                           | DSD SR30121 | 1               | 2                   |                    |
|                                                                       | DSD SR30221 | 2               | 2                   |                    |
|                                                                       | DSD SR30321 | 3               | 2                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |
| DOUBLE-THROW<br>without OFF<br>with electrically<br>isolated contacts | DSD SR30123 | 1               | 2                   |                    |
|                                                                       | DSD SR30223 | 2               | 2                   |                    |
|                                                                       | DSD SR30323 | 3               | 2                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |
| DOUBLE-THROW<br>with OFF                                              | DSD SR30132 | 1               | 3                   |                    |
|                                                                       | DSD SR30232 | 2               | 3                   |                    |
|                                                                       | DSD SR30332 | 3               | 3                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |
| DOUBLE-THROW<br>with OFF<br>and electrically<br>isolated contacts     | DSD SR30134 | 1               | 3                   |                    |
|                                                                       | DSD SR30234 | 2               | 3                   |                    |
|                                                                       | DSD SR30334 | 3               | 3                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |

### Electrical Specification

| Voltage | Horsepower Rating |     |
|---------|-------------------|-----|
|         | 3PH               | 1PH |
| 120     | 3                 | 1.5 |
| 240     | 7.5               | 3   |
| 480     | 10                | 5   |
| 600     | 10                | 5   |

Maximum Current: 30 A

Heavy-duty A600 rating

### Options:

#### Description

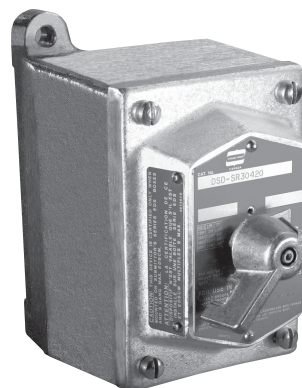
Lockout for 2 position switch, handle in either position

Lockout for 3 position switch, handle in either position

\*For CEC applications only.

Suffix  
**SX178**

**S349**



**DSD-SR cover assembly shown  
mounted to an EDS back box**

# EDS / EFS Series Control Stations

## Fully Assembled EFS and EDS Factory Sealed Devices

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C

### Applications:

Factory sealed enclosures are installed in a rigid metallic conduit system for surface mounting adjacent to or remote from equipment being controlled and are used:

- To prevent arcing of enclosed device from causing ignition of a specific hazardous atmosphere or atmospheres external to the enclosure
- In industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas, or metal handling or finishing areas where atmosphere may contain hazardous gases and/or dust
- In non-hazardous areas where sturdy, durable enclosures are required
- In conjunction with magnetic starters or contactors for remote control of motors

Manual motor starting switch enclosures are used:

- For manual starting of small AC or DC motors
- To provide manual starting and stopping and, in the case of units with heaters, motor running protection

### Features:

Factory sealed devices have many distinct advantages:

- Reduce installation problems
- Eliminate external seals
- Lower installation costs
- Improve safety
- Are used with general purpose snap and pushbutton type switches
- Standard neoprene covers for front operated pushbuttons. Prevents accumulation of dirt and entrance of water around operating shafts
- Mounting lugs and taper tapped hubs with integral bushings
- Large machine screws for fastening covers to bodies
- Lockout provisions on front operated pushbutton (marked "STOP" and "OFF") and selector switch covers
- Lockout hole for padlock having 1/4" hasp is provided when used with covers for front lever and side rocker type operation
- Close tolerances in machining of wide, mating flanges and journaled shafts and bearings for front button operation, produces flamtightness of enclosure joints
- On enclosures with front lever and side rocker type operating handles, threaded type shafts and bushings are used to ensure flamtightness
- Dead end (EFS or EDS) or through feed (EFSC or EDSC) hubs – 1/2" to 1" sizes
- When STOP is indicated, button is automatically red. When START is indicated, button is automatically green. Otherwise, black buttons are standard.

### Certifications and Compliances:

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EMAC: 3, 7B\*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

### Standard Materials:

- Bodies – *Feraloy*® iron alloy; copper-free aluminum
- Front operated pushbutton and pilot light covers – *Feraloy* iron alloy
- Side operated type pushbutton covers – copper-free aluminum
- Shafts – stainless steel
- Shaft bushings – stainless steel
- Rocker handle and pushbutton guards – type 6 / 6 nylon
- Sealing enclosures – copper-free aluminum

### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Type 6 / 6 nylon – black
- Stainless steel – natural

### Options:

The following special options are available from the factory by adding suffix to Cat. #:

| Description                                                                                                                                                                                                    | Suffix      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| • Emergency "Stop" button (momentary) – front operated red mushroom button.....                                                                                                                                | <b>S111</b> |
| • Lockout provision on front operated pushbutton cover (standard on buttons marked "OFF" and "STOP").....                                                                                                      | <b>S153</b> |
| • For 24 VDC operation on pilot lights .....                                                                                                                                                                   | <b>S300</b> |
| • Three-position selector switches with modified operation: Momentary contact clockwise operation, spring return to center, maintained contact counter-clockwise operation                                     | <b>S634</b> |
| • Momentary contact counter-clockwise operation, spring return to center, maintained contact clockwise operation....                                                                                           | <b>S635</b> |
| • Bodies and covers (single and two gang units) – copper-free aluminum.....                                                                                                                                    | <b>SA</b>   |
| • Where indicated in the catalog listings, EDS units suitable for Class I, Division 1, Group B usage can be supplied, add suffix -GB, EFS units are suitable for Class I, Division 1, Group B as standard..... | <b>GB</b>   |
| • Maintained contact mushroom head with lockout and guard. May not be combined with a pilot light if a transformer is required. (Push to stop only) .....                                                      | <b>S769</b> |
| • Spring return to center from right and left .....                                                                                                                                                            | <b>S842</b> |

EDS bodies and factory sealed cover and device sub-assemblies are available for field assembly (see page 521).

\*See suffix GB in Options section

4C

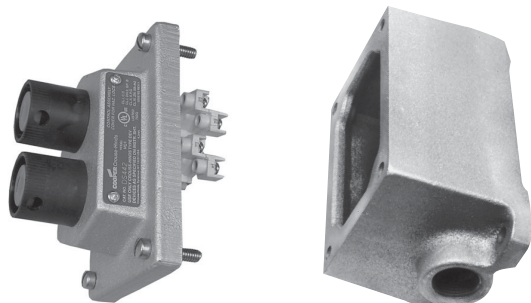
## EDS / EFS Series Control Stations

Fully Assembled EFS and  
EDS Factory Sealed Devices

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

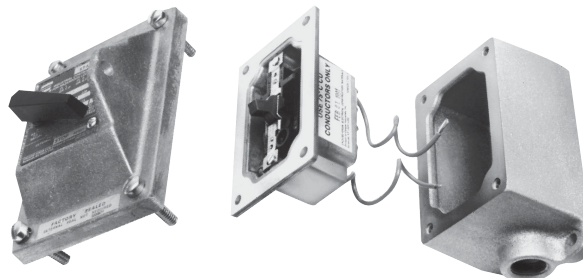
### Methods of Factory Sealing

#### EFS/EDS Series



Factory sealed EDS and EFS pilot light, pushbutton and selector switch control stations do not need external sealing. Device contacts are factory sealed in explosionproof ESWP contact blocks. Small, compact enclosures have accurately ground wide flanges on both the body and cover for a flame-tight joint.

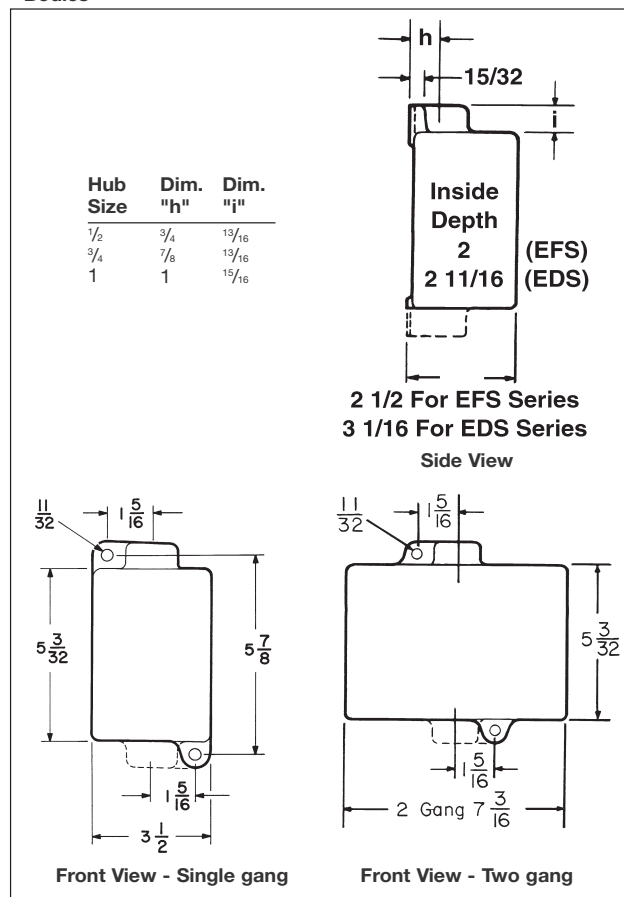
#### EDS Series



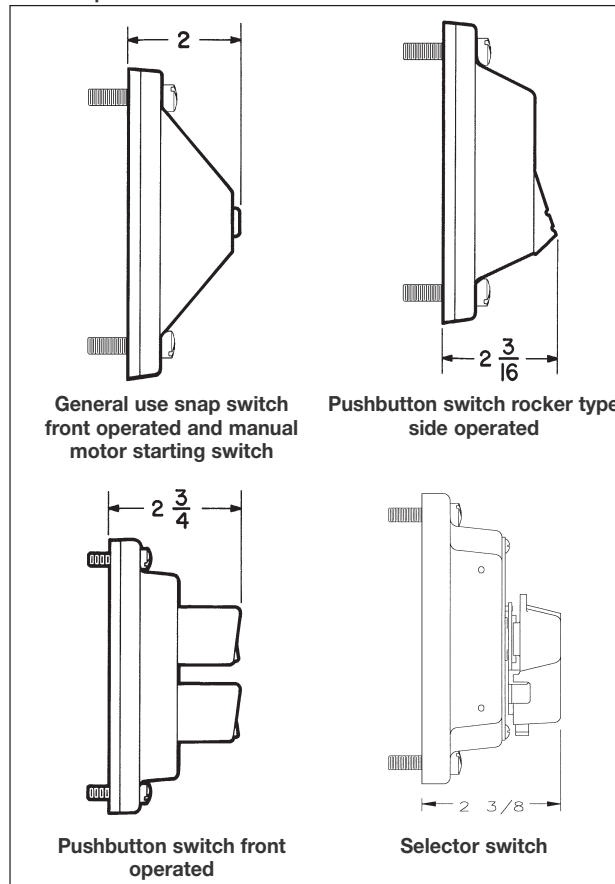
EDS factory sealed snap switches or manual motor starting switches do not need external sealing. The switches are enclosed in a unique sealing well with double flanges which mate with the cover and the body. Small, compact enclosures have accurately ground wide flanges on body, cover and sealing well for flame-tight joints. Wiring pigtails are factory sealed from under the sealing well. Reliable pouring of seals at the factory ensures safe sealing.

### Dimensions (Inches) ‡

#### Bodies



#### Covers†



\*See suffix GB in Options section.

‡Dimensions are approximate, not for construction purposes.

† Surface covers have same length and width as bodies.

# EDS / EFS Series Control Stations

**Fully Assembled EDS Factory Sealed  
Pushbutton Stations  
Front Operated, 600VAC Heavy Duty**

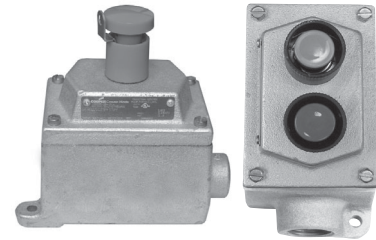
Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**4C**

## Ordering Information - Single Gang

| Normal Pos. | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                           | 2 Circuits<br>Universal | 2 Circuits■ |
|-------------|------------------------|-------------------------|---------------------------------------|-------------------------|-------------|
| Marking     | Specify                | Specify                 | START-STOP unless otherwise specified | Specify                 | Specify     |
| Diagram     |                        |                         |                                       |                         |             |

Replacement Pushbutton Contacts - see page 571



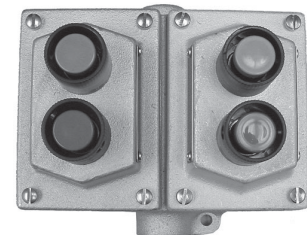
EDS2184 S769

EDS215

Maintained  
Mushroom Head

## Enclosure with Pushbuttons

| Hub Size | Cat. #              | Cat. #     | Cat. #    | Cat. #§    | Cat. #§    |
|----------|---------------------|------------|-----------|------------|------------|
|          | <b>Dead End</b>     |            |           |            |            |
| 1/2      | EDS1184 ①           |            | EDS115 ①  |            | EDS1155 ①  |
| 3/4      | EDS2184 ①           | EDS2190 ①  | EDS215 ①  | EDS2192 ①  | EDS2155 ①  |
| 1        | EDS3184 ①           | EDS3190 ①  | EDS315 ①  | EDS3192 ①  | EDS3155 ①  |
|          | <b>Through Feed</b> |            |           |            |            |
| 1/2      | EDSC1184 ①          | EDSC1190 ① | EDSC115 ① | EDSC1192 ① | EDSC1155 ① |
| 3/4      | EDSC2184 ①          | EDSC2190 ① | EDSC215 ① | EDSC2192 ① | EDSC2155 ① |
| 1        | EDSC3184 ①          | EDSC3190 ① | EDSC315 ① | EDSC3192 ① | EDSC3155 ① |



EDSC225

## Ordering Information - Two Gang

| Normal Pos.              | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                           |
|--------------------------|------------------------|-------------------------|---------------------------------------|
| Marking                  | Specify                | Specify                 | START-STOP unless otherwise specified |
| Diagram                  |                        |                         |                                       |
| Replacement Pushbuttons† | ED11                   | ED12                    | ED12■                                 |

## Enclosure with Pushbuttons

| Hub Size | Cat. #              | Cat. #     | Cat. #    |
|----------|---------------------|------------|-----------|
|          | <b>Dead End</b>     |            |           |
| 3/4      | EDS2284 ①           | EDS2290 ①  | EDS225 ①  |
| 1        | EDS3284 ①           | EDS3290 ①  | EDS325 ①  |
|          | <b>Through Feed</b> |            |           |
| 1/2      | EDSC1284 ①          | EDSC1290 ① | EDSC125 ① |
| 3/4      | EDSC2284 ①          | EDSC2290 ① | EDSC225 ① |
| 1        | EDSC3284 ①          | EDSC3290 ① | EDSC325 ① |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

\* Class I, Group B: Consider using EFS series pushbuttons, see page 528. All enclosures listed above can be modified for Class I, Group B, Div. 1 usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. These products are suitable for Group B, Div. 2 as listed, without external seals. In Canada, for Group B applications consult factory.

■ Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

§ Single external button operates both inner buttons simultaneously.

**Crouse-Hinds**

by **Eaton**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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# 4C EDS / EFS Series Control Stations

**Fully Assembled EFS Factory Sealed  
Pushbutton Stations  
Front Operated, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

## Ordering Information

| Normal Pos.                | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                                        | 2 Circuits<br>Universal | 2 Circuits■ |
|----------------------------|------------------------|-------------------------|----------------------------------------------------|-------------------------|-------------|
| Marking                    | Specify                | Specify                 | START-<br>STOP<br>unless<br>otherwise<br>specified | Specify                 | Specify     |
| Diagram                    |                        |                         |                                                    |                         |             |
| Replacement<br>Pushbutton§ | ED11                   | ED12                    | ED12■                                              | ED12                    | ED12■       |
| Enclosure with Pushbuttons |                        |                         |                                                    |                         |             |
| Hub Size                   | Cat. #                 | Cat. #                  | Cat. #                                             | Cat. #§                 | Cat. #§     |
|                            | <b>Dead End</b>        |                         |                                                    |                         |             |
| 1/2                        | EFS1184 ①              |                         | EFS115 ①                                           |                         | EFS1155 ①   |
| 3/4                        | EFS2184 ①              | EFS2190 ①               | EFS215 ①                                           | EFS2192 ①               | EFS2155 ①   |
| 1                          | EFS3184 ①              | EFS3190 ①               | EFS315 ①                                           | EFS3192 ①               | EFS3155 ①   |
|                            | <b>Through Feed</b>    |                         |                                                    |                         |             |
| 1/2                        | EFSC1184 ①             | EFSC1190 ①              | EFSC115 ①                                          | EFSC1192 ①              | EFSC1155 ①  |
| 3/4                        | EFSC2184 ①             | EFSC2190 ①              | EFSC215 ①                                          | EFSC2192 ①              | EFSC2155 ①  |
| 1                          | EFSC3184 ①             | EFSC3190 ①              | EFSC315 ①                                          | EFSC3192 ①              | EFSC3155 ①  |



**EFS2184 START**  
Standard black  
pushbutton



**EFS215**

## Dimensions

see page 526

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

\*Class I, Group B: All enclosures listed above are suitable for Class I, Group B, Div. 1 usage. Seals only have to be installed on 1 inch conduit within 5 ft. in Division 1.

‡For replacement contact blocks, see page 571.

■Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

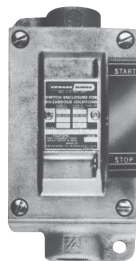
§Single external button operates both inner buttons simultaneously.

# EDS / EFS Series Control Stations

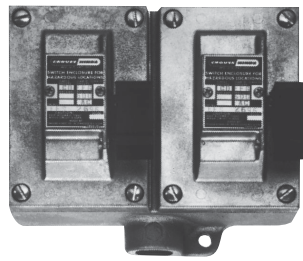
**Fully Assembled EDS Factory Sealed  
Pushbutton Stations  
Side Rocker Handle, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**4C**



EDSC2162



EDS2696

## Dimensions

see page 526

## Ordering Information - Single Gang

| Normal Pos.                 | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                                    |
|-----------------------------|------------------------|-------------------------|------------------------------------------------|
| Marking                     | Specify                | Specify                 | START-STOP<br>unless<br>otherwise<br>specified |
| Diagram                     |                        |                         |                                                |
| Replacement<br>Pushbuttons‡ | ED11                   | ED12                    | ED12■                                          |

### Enclosure with Pushbuttons

| Hub Size            | Cat. #     | Cat. #     | Cat. #     |
|---------------------|------------|------------|------------|
| <b>Dead End</b>     |            |            |            |
| 1/2                 | EDS1596 ①  |            | EDS1162 ①  |
| 3/4                 | EDS2596 ①  | EDS2194 ①  | EDS2162 ①  |
| 1                   | EDS3596 ①  | EDS3194 ①  | EDS3162 ①  |
| <b>Through Feed</b> |            |            |            |
| 1/2                 | EDSC1596 ① | EDSC1194 ① | EDSC1162 ① |
| 3/4                 | EDSC2596 ① | EDSC2194 ① | EDSC2162 ① |
| 1                   | EDSC3596 ① | EDSC3194 ① | EDSC3162 ① |

## Two Gang

| Normal Pos.                 | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits                                     |
|-----------------------------|------------------------|-------------------------|------------------------------------------------|
| Marking                     | Specify                | Specify                 | START-STOP<br>unless<br>otherwise<br>specified |
| Diagram                     |                        |                         |                                                |
| Replacement<br>Pushbuttons‡ | ED11                   | ED12                    | ED12■                                          |

### Enclosure with Pushbuttons

| Hub Size            | Cat. #     | Cat. #     | Cat. #     |
|---------------------|------------|------------|------------|
| <b>Dead End</b>     |            |            |            |
| 3/4                 | EDS2696 ①  | EDS2294 ①  | EDS2262 ①  |
| 1                   | EDS3696 ①  | EDS3294 ①  | EDS3262 ①  |
| <b>Through Feed</b> |            |            |            |
| 1/2                 | EDSC1696 ① | EDSC1294 ① | EDSC1262 ① |
| 3/4                 | EDSC2696 ① | EDSC2294 ① | EDSC2262 ① |
| 1                   | EDSC3696 ① | EDSC3294 ① | EDSC3262 ① |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

\*Class I, Group B: All enclosures listed above can be modified for Class I, Group B, Div. 1 usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. These products are suitable for Group B, Div. 2 as listed, without external seals.

‡For replacement contact blocks, see page 571.

■ Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.



## EDS / EFS Series Control Stations

### Fully Assembled EFS Pilot Lights

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

### Applications:

EFS pilot lights are used:

- In areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To visually indicate at a remote location that the desired function is being performed

### Features:

- Small, compact enclosures with accurately ground flange on both body and cover for flame-tight joint
- Pilot lights are factory sealed. Conventional external seals are not required
- Dead end (EFS) or through feed (EFSC) hubs – 1/2" to 1" sizes

### Certifications and Compliances:

- NEC/CEC:
  - Class I, Groups B\*, C, D
  - Class II, Groups E, F, G
  - Class III
- NEMA/EEMAC: 3, 7B\*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2

### Standard Materials:

- Bodies – *Feraloy*® iron alloy (U.S.) and copper-free aluminum (Canada)
- Pilot light covers – *Feraloy* iron alloy
- Operating shafts – stainless steel

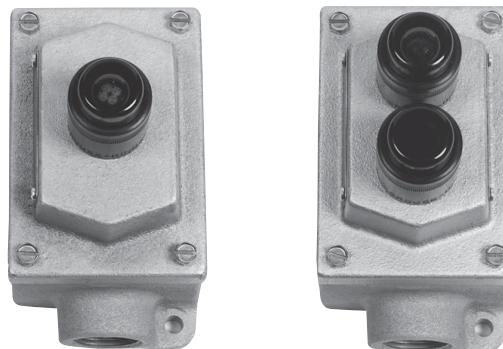
### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized with aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

### Electrical Rating Range:

- Pilot lights – 110 to 600VAC

\* External conduit seal required for 1 inch hub size in Division 1, Group B within 5 feet (1.5 meters) of enclosure.



### Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                                               | Suffix |
|-----------------------------------------------------------------------------------------------------------|--------|
| Pilot lights for circuit voltages up to 600 volts maximum (standard voltage range 110–125) – See Listings |        |
| LED pilot lights in place of standard incandescent pilot lamps                                            | LED    |
| Bodies and covers – copper-free aluminum                                                                  | SA     |
| 24 VDC operation on pilot lights                                                                          | S300   |



# EDS / EFS Series Control Stations

## Fully Assembled EFS Pilot Lights

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C

Pilot lights listed below are factory sealed and do not require external seals\*. Lamps are 6 watt, miniature bayonets, incandescent lamps for use on 110–125 volt circuits.

LED pilot lights can be provided in place of standard incandescent lamps by adding suffix LED after the color symbols. For Options see pages 530–531.

Enclosures with single pilot covers **only** can be equipped with a transformer for each lamp for high voltages as shown.

### Transformer Voltages Above 125

| Nominal Volts<br>50–60 Hertz<br>Transformer | Primary<br>Voltage<br>Range | Cat. #<br>Suffix |
|---------------------------------------------|-----------------------------|------------------|
| 220 / 110                                   | 220–240                     | T2               |
| 440 / 110                                   | 440–480                     | T4               |
| 550 / 110                                   | 550–600                     | T5               |

## Ordering Information

### Enclosure with Single Pilot Light†

| Hub Size | Dead End Cat. # | Through Feed Cat. # |
|----------|-----------------|---------------------|
| 1/2      | EFS11524 ①      | EFSC11524 ①         |
| 3/4      | EFS21524 ①      | EFSC21524 ①         |
| 1        | EFS31524 ①      | EFSC31524 ①         |

### Enclosure with Double Pilot Lights†

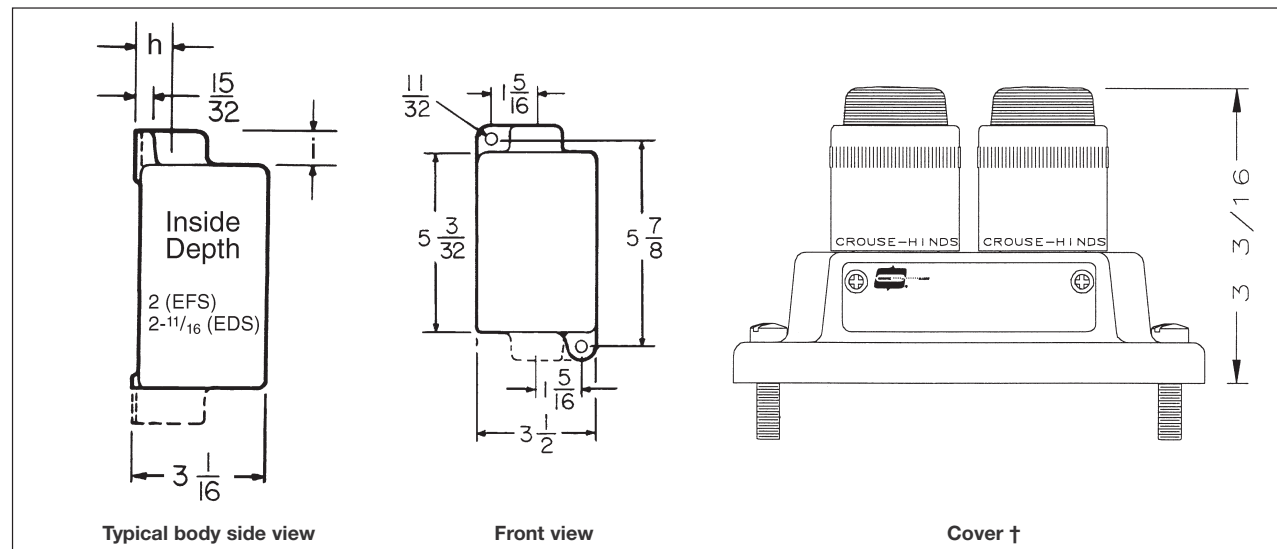
| Hub Size | Dead End Cat. # | Through Feed Cat. # |
|----------|-----------------|---------------------|
| 1/2      | EFS11561 ①      | EFSC11561 ①         |
| 3/4      | EFS21561 ①      | EFSC21561 ①         |
| 1        | EFS31561 ①      | EFSC31561 ①         |

① Add color symbol for each pilot light from table below. Example: EFS11561 with red and green lights is EFS11561-J1-J3

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

## Dimensions

### In Inches:



Dimensions are approximate, not for construction purposes.

| Hub Size | Dim. "h" | Dim. "i" |
|----------|----------|----------|
| 1/2      | 3/4      | 13/16    |
| 3/4      | 7/8      | 13/16    |
| 1        | 1        | 15/16    |

\* External conduit seal required for 1 inch hub size in Division 1, Group B within 5 feet (1.5 meters) of enclosure.

† LED pilot lights can be furnished in place of standard incandescent pilot lamps.

Add suffix LED to catalog number after color symbol.

† Surface covers have same length and width dimensions as bodies.

## Crouse-Hinds

by E.T.N

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531

4C

## 4C EDS / EFS Series Control Stations

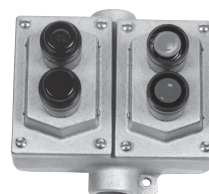
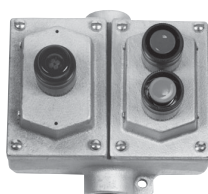
**Fully Assembled EDS Factory Sealed  
Combination Pushbutton and Pilot Light  
Stations 600VAC, Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

Pushbutton contacts and pilot light receptacles are sealed in separate chambers. External seals are not required. Lamps† are 6 watt, type S6, candelabra base for use on 110–125 volt circuits.

Two gang units with single pilot light covers can be furnished with transformers. Specify markings for each button. See table below listings.



**Dimensions**  
see page 526

4C

### Ordering Information - Single Gang

| Description       | Dead End | Through Feed |
|-------------------|----------|--------------|
| No. Pushbuttons   | 1        | 1            |
| No. Pilot Lights† | 1        | 1            |
| Diagram           |          |              |

| Hub Size | Cat. #      | Cat. #       |
|----------|-------------|--------------|
| 1/2      | EDS11473 ①② | EDSC11473 ①② |
| 3/4      | EDS21473 ①② | EDSC21473 ①② |
| 1        | EDS31473 ①② | EDSC31473 ①② |

### Ordering Information - Two Gang

|                   | Dead End | Through Feed | Dead End | Through Feed |
|-------------------|----------|--------------|----------|--------------|
| No. Pushbuttons   | 2        | 2            | 2        | 2            |
| No. Pilot Lights† | 1        | 1            | 2        | 2            |
| Diagram           |          |              |          |              |

| Hub Size | Cat. #      | Cat. #       | Hub Size | Cat. #      | Cat. #       | Cat. #      | Cat. #       |
|----------|-------------|--------------|----------|-------------|--------------|-------------|--------------|
| 1/2      | EDS12471 ①② | EDSC12471 ①② | 1/2      | EDS22471 ①② | EDSC22471 ①② | EDS22868 ①② | EDSC22868 ①② |
| 3/4      | EDS22471 ①② | EDSC22471 ①② | 3/4      | EDS32471 ①② | EDSC32471 ①② | EDS32868 ①② | EDSC32868 ①② |
| 1        | EDS32471 ①② | EDSC32471 ①② | 1        |             |              |             |              |

① Add color symbol for each pilot light from table below. Example: EDS21473 with a red light is EDS21473-J1

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |           |       |      |          |      |           |     |
|-------|-----------|-------|------|----------|------|-----------|-----|
| START | LIGHT ON  | DOWN  | RUN  | FORWARD  | ON   | AUTOMATIC | OUT |
| STOP  | EMERGENCY | RAISE | TRIP | CLOSE IN | JOG  | REVERSE   |     |
| RESET | OPEN      | STOP  | HAND | LOWER    | TEST | UP        |     |

\* All enclosures listed above can be modified for Class I, Group B, Division 1 usage. Add suffix GB to the Cat. No. Example: EDS11473-J1-GB. Conduit seal(s) must be installed within 1 1/2" of each conduit opening. These products are suitable for Group B, Div. 2 as listed, without external conduit seals.

† LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED to catalog number after color symbol. For 24 VDC operation on pilot lights add suffix S300.

# EDS / EFS Series Control Stations

**Fully Assembled EDS Factory Sealed  
Selector Switches  
Maintained Contact, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

**4C**

Furnished with pushbuttons, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below. Specify indicating plate markings. See table below listings.



EDS11273

## Dimensions

see page 526

## Ordering Information - Single Gang

| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks† | Enclosure with Switch |                 |                     |
|--------------------------------|------------|------------|------------|-----------------------------|-----------------------|-----------------|---------------------|
|                                |            |            |            |                             | Hub Size              | Dead End Cat. # | Through Feed Cat. # |
| Two-Position, Two-Circuit      | A1         |            |            | ED11                        | 1/2                   | EDS11271 ①      | EDSC11271 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21271 ①      | EDSC21271 ①         |
|                                |            |            |            |                             | 1                     | EDS31271 ①      | EDSC31271 ①         |
| Two-Position, Four-Circuit     | A1         |            |            | ED12                        | 1/2                   | EDS11272 ①      | EDSC11272 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21272 ①      | EDSC21272 ①         |
|                                | B1         |            |            |                             | 1                     | EDS31272 ①      | EDSC31272 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
| Three-Position, Two-Circuit ‡  | A1         |            |            | ED11                        | 1/2                   | EDS11273 ①      | EDSC11273 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21273 ①      | EDSC21273 ①         |
|                                |            |            |            |                             | 1                     | EDS31273 ①      | EDSC31273 ①         |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED12                        | 1/2                   | EDS11274 ①      | EDSC11274 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21274 ①      | EDSC21274 ①         |
|                                | B1         |            |            |                             | 1                     | EDS31274 ①      | EDSC31274 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
|                                | A1         |            |            | ED12                        | 1/2                   | EDS11275 ①      | EDSC11275 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21275 ①      | EDSC21275 ①         |
|                                | B1         |            |            |                             | 1                     | EDS31275 ①      | EDSC31275 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Two-Position

RUN, JOG  
HAND, AUTOMATIC  
FORWARD, REVERSE

FAST, SLOW  
OPEN, CLOSE  
UP, DOWN  
ON, OFF

IN, OUT  
RAISE, LOWER  
START, STOP

### Three-Position

RUN, OFF, JOG  
HAND, OFF, AUTOMATIC  
FORWARD, OFF, REVERSE  
FAST, OFF, SLOW

1, OFF, 2  
OPEN, OFF, CLOSE  
UP, OFF, DOWN

\*For Class I, Group B: Consider using EFS series selector switches, see page 534. All enclosures listed above can be modified for Class I, Group B, Div. 1 usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. These products are suitable for Group B, Div. 2 as listed, without external seals. In Canada, for Group B applications consult factory.

† For replacement contact blocks, see page 571.

‡ Suffixes S634 or S635 may be used on these catalog numbers. See page 525 for explanation of options.

**Crouse-Hinds**

by **Eaton**

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# 4C EDS / EFS Series Control Stations

**Fully Assembled EFS Factory Sealed  
Selector Switches  
Maintained Contact, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

Furnished with pushbuttons, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below. Specify indicating plate markings. See table below listings.



EFS11273

**Dimensions**  
see page 526

4C

## Ordering Information - Single Gang

| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks† | Enclosure with Switch |                 |                     |
|--------------------------------|------------|------------|------------|-----------------------------|-----------------------|-----------------|---------------------|
|                                |            |            |            |                             | Hub Size              | Dead End Cat. # | Through Feed Cat. # |
| Two-Position, Two-Circuit      | A1         |            |            | ED11                        | 1/2                   | EFS11271 ①      | EFSC11271 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21271 ①      | EFSC21271 ①         |
|                                |            |            |            |                             | 1                     | EFS31271 ①      | EFSC31271 ①         |
| Two-Position, Four-Circuit     | A1         |            |            | ED12                        | 1/2                   | EFS11272 ①      | EFSC11272 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21272 ①      | EFSC21272 ①         |
|                                | B1         |            |            |                             | 1                     | EFS31272 ①      | EFSC31272 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
| Three-Position, Two-Circuit ‡  | A1         |            |            | ED11                        | 1/2                   | EFS11273 ①      | EFSC11273 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21273 ①      | EFSC21273 ①         |
|                                |            |            |            |                             | 1                     | EFS31273 ①      | EFSC31273 ①         |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED12                        | 1/2                   | EFS11274 ①      | EFSC11274 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21274 ①      | EFSC21274 ①         |
|                                | B1         |            |            |                             | 1                     | EFS31274 ①      | EFSC31274 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
|                                | A1         |            |            | ED12                        | 1/2                   | EFS11275 ①      | EFSC11275 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21275 ①      | EFSC21275 ①         |
|                                | B1         |            |            |                             | 1                     | EFS31275 ①      | EFSC31275 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Two-Position

|                  |             |              |
|------------------|-------------|--------------|
| RUN, JOG         | FAST, SLOW  | IN, OUT      |
| HAND, AUTOMATIC  | OPEN, CLOSE | RAISE, LOWER |
| FORWARD, REVERSE | UP, DOWN    | START, STOP  |
|                  | ON, OFF     |              |

### Three-Position

|                       |                  |
|-----------------------|------------------|
| RUN, OFF, JOG         | 1, OFF, 2        |
| HAND, OFF, AUTOMATIC  | OPEN, OFF, CLOSE |
| FORWARD, OFF, REVERSE | UP, OFF, DOWN    |
| FAST, OFF, SLOW       |                  |

\*Class I, Group B: All enclosures listed above are suitable for Class I, Group B, Div. 1 usage. Seals only have to be installed on 1 inch conduit within 5 ft. in Division 1.

† For replacement contact blocks, see page 571.

‡ Suffixes S634 or S635 may be used on these catalog numbers. See page 525 for explanation of options.

EDS / EFS Series Control Stations

Fully Assembled EDS Factory Sealed  
General Use Snap Switches

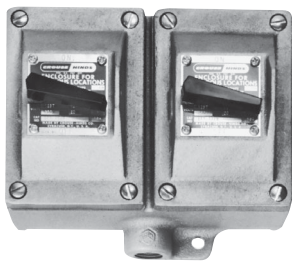
Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C



EDSC2129



EDS2229

Dimensions  
see page 526

Ordering Information - General Use Snap Switch – Front Operated

| Hub<br>Size | Style† | Amperes |         | Single Gang        |                        | Two Gang‡          |                        | Factory Sealed<br>Replacement<br>Switch |
|-------------|--------|---------|---------|--------------------|------------------------|--------------------|------------------------|-----------------------------------------|
|             |        | 120VAC§ | 277VAC§ | Dead End<br>Cat. # | Through<br>Feed Cat. # | Dead End<br>Cat. # | Through<br>Feed Cat. # |                                         |
|             |        |         |         |                    |                        |                    |                        |                                         |
| ¾           | 1-pole | 20      | 20      | EDS2129            | EDSC2129†              | EDS2229            | EDSC2229†              | SW5                                     |
| ¾           | 2-pole | 20      | 20      | EDS218             | EDSC218†               |                    | EDSC228†               | SW6                                     |
| ¾           | 3-way  | 20      | 20      | EDS2130            | EDSC2130               | EDS2230            | EDSC2230               | SW7                                     |
| ¾           | 4-way  | 20      | 20      | EDS2140            | EDSC2140               |                    | EDSC2240               | SW8                                     |
| 1           | 1-pole | 20      | 20      | EDS3129            | EDSC3129†              | EDS3229            | EDSC3229†              | SW5                                     |
| 1           | 2-pole | 20      | 20      | EDS318             | EDSC318†               | EDS328             | EDSC328†               | SW6                                     |
| 1           | 3-way  | 20      | 20      | EDS3130            | EDSC3130               | EDS3230            | EDSC3230               | SW7                                     |
| 1           | 4-way  | 20      | 20      | EDS3140            | EDSC3140               | EDS3240            | EDSC3240               | SW8                                     |

\*Standard as Class I, Division 2, Group B. No seals required. For Class I, Division 1, Group B: All units on this page can be modified for Class I, Division 1, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1.  
† ON-OFF standard marking for 1-pole and 2-pole units.  
‡ Combinations of switches can be furnished.  
§ AC rated switches are tested for resistive, inductive and tungsten filament loads up to the full current rating and for motor loads up to 80% of the ampere rating.

4C

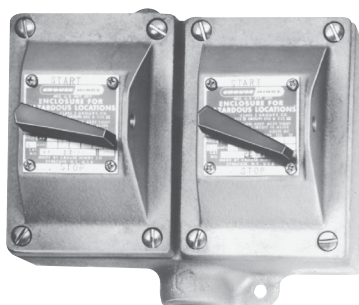
## 4C EDS / EFS Series Control Stations

**Fully Assembled EDS Factory Sealed  
Manual Motor Starting Switches  
and Enclosures**

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG



EDS2199



EDS2229

4C

### Ordering Information

**With Allen-Bradley Bulletin 600 Switches**  
Maximum HP Ratings

| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC   | Allen-Bradley Switch<br>Cat. # |                                         |
|--------------------|---------------------|-----------------------|--------------------------------|-----------------------------------------|
| 1                  | 1 hp                |                       | A B BUL 600 T0X4               |                                         |
| 2                  | 1 hp                | 3/4 hp                | A B BUL 600 T0X5               |                                         |
| Poles              | Hub<br>Size<br>in.  | Dead<br>End<br>Cat. # | Through<br>Feed<br>Cat. #      | Factory Sealed<br>Replacement<br>Switch |
| <b>Single Gang</b> |                     |                       |                                |                                         |
| 1                  | 3/4                 | EDS2199 ①             | EDSC2199 ①                     | SW9                                     |
|                    | 1                   | EDS3199 ①             | EDSC3199 ①                     | SW9                                     |
| 2                  | 3/4                 | EDS21100 ①            | EDSC21100 ①                    | SW10                                    |
|                    | 1                   | EDS31100 ①            | EDSC31100 ①                    | SW10                                    |
| <b>Two Gang</b>    |                     |                       |                                |                                         |
| 1                  | 3/4                 | EDS2299 ①             | EDSC2299 ①                     | SW9                                     |
|                    | 1                   | EDS3299 ①             | EDSC3299 ①                     | SW9                                     |
| 2                  | 3/4                 | EDS22100 ①            | EDSC22100 ①                    | SW10                                    |
|                    | 1                   | EDS32100 ①            | EDSC32100 ①                    | SW10                                    |

### ① Heater Table (Allen Bradley)

| Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number | Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number |
|------------------------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------|
| 0.17                               | P1                                              | 2.40                               | P20                                             |
| 0.21                               | P2                                              | 2.58                               | P21                                             |
| 0.25                               | P3                                              | 2.92                               | P22                                             |
| 0.32                               | P4                                              | 3.09                               | P23                                             |
| 0.39                               | P5                                              | 3.32                               | P24                                             |
| 0.46                               | P6                                              | 3.77                               | P25                                             |
| 0.57                               | P7                                              | 4.16                               | P26                                             |
| 0.71                               | P8                                              | 4.51                               | P27                                             |
| 0.79                               | P9                                              | 4.93                               | P28                                             |
| 0.87                               | P10                                             | 5.43                               | P29                                             |
| 0.98                               | P11                                             | 6.03                               | P30                                             |
| 1.08                               | P12                                             | 6.83                               | P31                                             |
| 1.19                               | P13                                             | 7.72                               | P32                                             |
| 1.30                               | P14                                             | 8.24                               | P33                                             |
| 1.43                               | P15                                             | 8.90                               | P34                                             |
| 1.58                               | P16                                             | 9.60                               | P35                                             |
| 1.75                               | P17                                             | 10.80                              | P36                                             |
| 1.88                               | P18                                             | 12.00                              | P37                                             |
| 2.13                               | P19                                             | 13.50                              | P38                                             |
|                                    |                                                 | 15.20                              | P39                                             |

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted. Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS21101-W5. Insert symbol 0 (zero) to omit heater.

\* Class I, Group B: All units on this page can be modified for Class I, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. In Canada, for Group B applications consult factory.  
① Includes one interchangeable heater. Select from the heater table and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

# EDS / EFS Series Control Stations

## Fully Assembled EDS Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**4C**

### Ordering Information With General Electric Switches Maximum HP Ratings

| Poles | 115-230<br>Volts AC | 115<br>Volts DC | 230<br>Volts DC | G.E. Switch<br>Cat. # |
|-------|---------------------|-----------------|-----------------|-----------------------|
| 1     | 1 hp                | 1 hp            | ¼ hp            | CR101 Y               |
| 2     | 1 hp                | 1 hp            | 1 hp            | CR101 H               |

| Poles              | Hub<br>Size<br>in. | Dead<br>End<br>Cat. # | Through<br>Feed<br>Cat. # | Factory Sealed<br>Replacement<br>Switch |
|--------------------|--------------------|-----------------------|---------------------------|-----------------------------------------|
| <b>Single Gang</b> |                    |                       |                           |                                         |
| 1                  | ¾                  | EDS21093 ①            | EDSC21093 ①               | SW11                                    |
|                    | 1                  | EDS31093 ①            | EDSC31093 ①               | SW11                                    |
| 2                  | ¾                  | EDS21094 ①            | EDSC21094 ①               | SW12                                    |
|                    | 1                  | EDS31094 ①            | EDSC31094 ①               | SW12                                    |
| <b>Two Gang</b>    |                    |                       |                           |                                         |
| 1                  | ¾                  | EDS22093 ①            | EDSC22093 ①               | SW11                                    |
|                    | 1                  | EDS32093 ①            | EDSC32093 ①               | SW11                                    |
| 2                  | ¾                  | EDS22094 ①            | EDSC22094 ①               | SW12                                    |
|                    | 1                  | EDS32094 ①            | EDSC32094 ①               | SW12                                    |

### ① Heater Table (General Electric)

| Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number | Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number |
|------------------------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------|
| .48                                | G2                                              | 3.01                               | G22                                             |
| .53                                | G3                                              | 3.27                               | G23                                             |
| .58                                | G4                                              | 3.56                               | G24                                             |
| .65                                | G5                                              | 3.88                               | G25                                             |
| .71                                | G6                                              | 4.22                               | G26                                             |
| .78                                | G7                                              | 4.60                               | G27                                             |
| .86                                | G8                                              | 5.00                               | G28                                             |
| .95                                | G9                                              | 5.43                               | G29                                             |
| 1.04                               | G10                                             | 5.90                               | G30                                             |
| 1.14                               | G11                                             | 6.41                               | G31                                             |
| 1.25                               | G12                                             | 6.98                               | G32                                             |
| 1.37                               | G13                                             | 7.60                               | G33                                             |
| 1.49                               | G14                                             | 8.25                               | G34                                             |
| 1.63                               | G15                                             | 8.95                               | G35                                             |
| 1.78                               | G16                                             | 9.75                               | G36                                             |
| 1.95                               | G17                                             | 10.60                              | G37                                             |
| 2.13                               | G18                                             | 11.40                              | G38                                             |
| 2.32                               | G19                                             | 12.50                              | G39                                             |
| 2.53                               | G20                                             | 13.60                              | G40                                             |
| 2.76                               | G21                                             | 14.80                              | G41                                             |
|                                    |                                                 | 16.00                              | G42                                             |

### Dimensions

see page 526

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted. Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS21101-W5. Insert symbol 0 (zero) to omit heater.

\*Class I, Group B: All units on this page can be modified for Class I, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1½" of each conduit opening in Division 1. In Canada, for Group B applications consult factory.

① Includes one interchangeable heater. Select from the heater table and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

### Ordering Information With Cutler-Hammer Switches Maximum HP Ratings

| Poles | 120-240<br>Volts AC | 32<br>Volts DC | 120<br>Volts DC | 240<br>Volts DC | Cutler-Hammer<br>Switch Cat. # |
|-------|---------------------|----------------|-----------------|-----------------|--------------------------------|
| 1     | 1 hp                | ¼ hp           |                 | ¼ hp            | MST01                          |
| 2     | 1 hp                | ¼ hp           | 1 hp            | 1 hp            | MST02                          |

| Poles              | Hub<br>Size<br>in. | Dead<br>End<br>Cat. # | Through<br>Feed<br>Cat. # | Factory Sealed<br>Replacement<br>Switch |
|--------------------|--------------------|-----------------------|---------------------------|-----------------------------------------|
| <b>Single Gang</b> |                    |                       |                           |                                         |
| 1                  | ¾                  | EDS21101 ①            | EDSC21101 ①               | SW13                                    |
|                    | 1                  | EDS31101 ①            | EDSC31101 ①               | SW13                                    |
| 2                  | ¾                  | EDS21102 ①            | EDSC21102 ①               | SW14                                    |
|                    | 1                  | EDS31102 ①            | EDSC31102 ①               | SW14                                    |
| <b>Two Gang</b>    |                    |                       |                           |                                         |
| 1                  | ¾                  | EDS22101 ①            | EDSC22101 ①               | SW13                                    |
|                    | 1                  | EDS32101 ①            | EDSC32101 ①               | SW13                                    |
| 2                  | ¾                  | EDS22102 ①            | EDSC22102 ①               | SW14                                    |
|                    | 1                  | EDS32102 ①            | EDSC32102 ①               | SW14                                    |

### ① Heater Table (Cutler-Hammer)

| Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number | Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number |
|------------------------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------|
| .43                                | W1                                              | 2.95                               | W21                                             |
| .48                                | W2                                              | 3.27                               | W22                                             |
| .53                                | W3                                              | 3.59                               | W23                                             |
| .58                                | W4                                              | 3.99                               | W24                                             |
| .64                                | W5                                              | 4.39                               | W25                                             |
| .71                                | W6                                              | 4.79                               | W26                                             |
| .78                                | W7                                              | 5.26                               | W27                                             |
| .87                                | W8                                              | 5.83                               | W28                                             |
| .95                                | W9                                              | 6.39                               | W29                                             |
| 1.03                               | W10                                             | 7.03                               | W30                                             |
| 1.15                               | W11                                             | 7.74                               | W31                                             |
| 1.27                               | W12                                             | 8.46                               | W32                                             |
| 1.35                               | W13                                             | 9.35                               | W33                                             |
| 1.51                               | W14                                             | 10.30                              | W34                                             |
| 1.67                               | W15                                             | 11.35                              | W35                                             |
| 1.83                               | W16                                             | 12.47                              | W36                                             |
| 1.99                               | W17                                             | 13.67                              | W37                                             |
| 2.23                               | W18                                             | 15.12                              | W38                                             |
| 2.47                               | W19                                             | 16.00                              | W39                                             |
| 2.71                               | W20                                             |                                    |                                                 |

## Crouse-Hinds

by **EATON**

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4C



# 4C EDS / EFS Series Control Stations

## Fully Assembled EFS Fire Alarm Station

Cl. I, Div. 1, Groups B\*, C, D Explosionproof  
 Cl. I, Div. 2, Groups B, C, D Dust-Ignitionproof  
 Cl. II, Div. 1, Groups E, F, G Raintight  
 Cl. II, Div. 2, Groups F, G Wet Locations  
 Cl. III  
 NEMA 3, 7B\*CD, 9EFG

### Applications:

EFS Fire Alarm Stations are used:

- In areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To indicate at a remote location that a fire exists in the area

### Features:

- Small, compact enclosures with accurately ground flange on both body and cover for flame-tight joint
- Available in red for fire alarm applications

### Certifications and Compliances:

- NEC
  - Class I, Groups B\*, C, D
  - Class II, Groups E, F, G
  - Class III
- NEMA 3, 7B\*CD, 9EFG
- UL Standard: 1203
- As indicated under catalog listings, certain units can be supplied for Class I, Division 1, Group B (NEMA 7B). Seals must be installed within 1 1/2" of each conduit opening.

### Standard Materials:

- Bodies – *Feraloy*® iron alloy (U.S.) and copper-free aluminum (Canada)

### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized with aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

### Options:

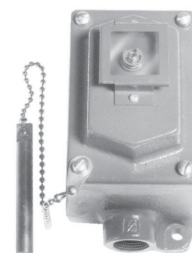
The following special option is available from factory by adding suffix to Cat. #:

#### Description

Where indicated in the catalog listings, units suitable for Class I, Division 1, Group B usage can be supplied.....

#### Suffix

GB\*



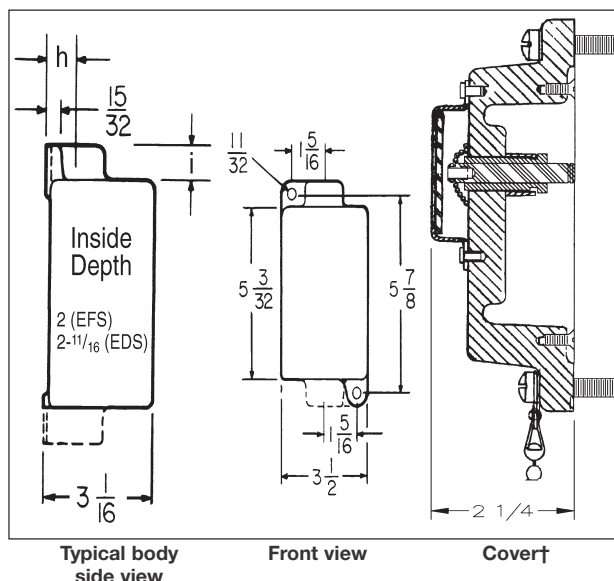
EFS21095

### Ordering Information

| Hub Size | Dead End Cat. # | Through Feed Cat. # |
|----------|-----------------|---------------------|
| 3/4      | EFS21095        | EFSC21095           |

### Dimensions

In Inches:



| Hub Size | Dim. "h" | Dim. "i" |
|----------|----------|----------|
| 1/2      | 3/4      | 13/16    |
| 3/4      | 7/8      | 13/16    |
| 1        | 1        | 13/16    |

Dimensions are approximate, not for construction purposes.

†Surface covers have same length and width dimensions as bodies.

\*Class I, Group B option: Units listed above can be modified for Class I, Division 1, Group B usage. Add suffix GB to the Cat. No. Example: EFS21095-GB. Seals must be installed within 1 1/2" of each conduit opening.

# EDS / EFS Series Control Stations

## Sub-assembly Reference Guide

For a complete list of components for EDS & EFS Control Stations, see page 514 for FlexStation™ Series

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### Control Stations and their Sub-assemblies

| Complete Control Station              | Sub-assembly          |               | Notes and Requirements                                                                                                                                          |
|---------------------------------------|-----------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | Cover & Device        | Cast Back Box |                                                                                                                                                                 |
| PUSHBUTTONS                           |                       |               |                                                                                                                                                                 |
| EDS2184                               | DSD918                | EDS271        |                                                                                                                                                                 |
| EDSC2184                              | DSD918                | EDSC271       |                                                                                                                                                                 |
| EDS215                                | DSD922                | EDS271        | Start/ Stop Legend included                                                                                                                                     |
| EDSC215                               | DSD922                | EDSC271       | Start/ Stop Legend included                                                                                                                                     |
| EDS2190                               | DSD921                | EDS271        |                                                                                                                                                                 |
| EDSC2190                              | DSD921                | EDSC271       |                                                                                                                                                                 |
| EDS2184-S769-EM-SP                    | DSD918-S769-EM-SP     | EDS271        | Emergency Stop Legend included                                                                                                                                  |
| EDSC2184-S769-EM-SP                   | DSD918-S769-EM-SP     | EDSC271       | Emergency Stop Legend included                                                                                                                                  |
| EDS2284                               | (2) DSD918            | EDS272        |                                                                                                                                                                 |
| EDSC2284                              | (2) DSD918            | EDSC272       |                                                                                                                                                                 |
| EDS225                                | (2) DSD922            | EDS272        | Start/ Stop Legend included                                                                                                                                     |
| EDSC225                               | (2) DSD922            | EDSC272       | Start/ Stop Legend included                                                                                                                                     |
| EDS2290                               | (2) DSD921            | EDS272        |                                                                                                                                                                 |
| EDSC2290                              | (2) DSD921            | EDSC272       |                                                                                                                                                                 |
| PILOT LIGHTS                          |                       |               |                                                                                                                                                                 |
| EFS21524-J*                           | DSD948-J*             | EDS271 †      | * Insert pilot light color<br>† When using the EFS Series pilot light in Cl. I, Div. 1, Group B applications, the EFS back box is required in place of the EDS. |
| EFSC21524-J*                          | DSD948-J*             | EDSC271 †     |                                                                                                                                                                 |
| EFS21561-J*-J*                        | DSD947-J*-J*          | EDS271 †      |                                                                                                                                                                 |
| EFSC21561-J*-J*                       | DSD947-J*-J*          | EDSC271 †     |                                                                                                                                                                 |
| PUSHBUTTON / PILOT LIGHT COMBINATIONS |                       |               |                                                                                                                                                                 |
| EDS21473-J*                           | DSD958-J*             | EDS271        | * Insert pilot light color                                                                                                                                      |
| EDSC21473-J*                          | DSD958-J*             | EDSC271       | * Insert pilot light color                                                                                                                                      |
| EDS22471-J*                           | DSD948-J* & DSD921    | EDS272        | * Insert pilot light color                                                                                                                                      |
| EDSC22471-J*                          | DSD948-J* & DSD921    | EDSC272       | * Insert pilot light color                                                                                                                                      |
| EDS22868-J*-J*                        | DSD947-J*-J* & DSD921 | EDS272        | * Insert pilot light color                                                                                                                                      |
| EDSC22868-J*-J*                       | DSD947-J*-J* & DSD921 | EDSC272       | * Insert pilot light color                                                                                                                                      |
| SELECTOR SWITCHES                     |                       |               |                                                                                                                                                                 |
| EDS21271                              | DSD923                | EDS271        |                                                                                                                                                                 |
| EDSC21271                             | DSD923                | EDSC271       |                                                                                                                                                                 |
| EDS21272                              | DSD924                | EDS271        |                                                                                                                                                                 |
| EDSC21272                             | DSD924                | EDSC271       |                                                                                                                                                                 |
| EDS21273                              | DSD925                | EDS271        |                                                                                                                                                                 |
| EDSC21273                             | DSD925                | EDSC271       |                                                                                                                                                                 |
| EDS21274                              | DSD926                | EDS271        |                                                                                                                                                                 |
| EDSC21274                             | DSD926                | EDSC271       |                                                                                                                                                                 |
| EDS21275                              | DSD927                | EDS271        |                                                                                                                                                                 |
| EDSC21275                             | DSD927                | EDSC271       |                                                                                                                                                                 |
| MANUAL MOTOR STARTER WITH O/L         |                       |               |                                                                                                                                                                 |
| EDS21101                              | DS415A & SW13         | EDS271        | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21101                             | DS415A & SW13         | EDSC271       | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21102                              | DS415A & SW14         | EDS271        | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21102                             | DS415A & SW14         | EDSC271       | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21093                              | DS415A & SW11         | EDS271        | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21093                             | DS415A & SW11         | EDSC271       | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21094                              | DS415A & SW12         | EDS271        | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21094                             | DS415A & SW12         | EDSC271       | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDS2199                               | DS415A & SW9          | EDS271        | "-P * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC2199                              | DS415A & SW9          | EDSC271       | "-P * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21100                              | DS415A & SW10         | EDS271        | "-P * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21100                             | DS415A & SW10         | EDSC271       | "-P * " for heater, or "-0" distributor provided                                                                                                                |

### Sub-assembly Reference Guide

## Control Stations and their Sub-assemblies

|                          | Sub-assembly            |               |                                     |
|--------------------------|-------------------------|---------------|-------------------------------------|
| Complete Control Station | Cover & Device          | Cast Back Box | Notes and Requirements              |
| MANUAL MOTOR STARTER     |                         |               |                                     |
| EFD218-T8                | DSD916                  | EDS271        |                                     |
| Alternative              | DS415A & SQ D 2510 KO-1 | EDS271        | SQ D switch provided by distributor |
| EFDC218-T8               | DSD916                  | EDSC271       |                                     |
| Alternative              | DS415A & SQ D 2510 KO-1 | EDSC271       | SQ D switch provided by distributor |
| EFD2419                  | DSD917                  | EDS271        |                                     |
| Alternative              | DS415A & GE 2368S       | EDS271        | GE switch provided by distributor   |
| EFDC2419                 | DSD917                  | EDSC271       |                                     |
| Alternative              | DS415A & GE 2368S       | EDSC271       | GE switch provided by distributor   |
| SNAP SWITCHES            |                         |               |                                     |
| EDS2129                  | DS652 & SW5             | EDS271        |                                     |
| Alternative              | DSD933                  | EDS271        | External Sealing Fitting Required   |
| EDSC2129                 | DS652 & SW5             | EDSC271       |                                     |
| Alternative              | DSD933                  | EDSC271       | External Sealing Fitting Required   |
| EDS218                   | DS652 & SW6             | EDS271        |                                     |
| Alternative              | DSD634                  | EDS271        | External Sealing Fitting Required   |
| EDSC218                  | DS652 & SW6             | EDSC271       |                                     |
| Alternative              | DSD634                  | EDSC271       | External Sealing Fitting Required   |
| EDS2130                  | DS652 & SW7             | EDS271        |                                     |
| Alternative              | DSD936                  | EDS271        | External Sealing Fitting Required   |
| EDSC2130                 | DS652 & SW7             | EDSC271       |                                     |
| Alternative              | DSD936                  | EDSC271       | External Sealing Fitting Required   |
| EDS2140                  | DS652 & SW8             | EDS271        |                                     |
| Alternative              | DSD937                  | EDS271        | External Sealing Fitting Required   |
| EDSC2140                 | DS652 & SW8             | EDSC271       |                                     |
| Alternative              | DSD937                  | EDSC271       | External Sealing Fitting Required   |
| EDS2229                  | (2) DS652 & (2) SW5     | EDS272        |                                     |
| Alternative              | (2) DSD933              | EDS272        | External Sealing Fitting Required   |
| EDSC2229                 | (2) DS652 & (2) SW5     | EDSC272       |                                     |
| Alternative              | (2) DSD933              | EDSC272       | External Sealing Fitting Required   |
| EDSC228                  | (2) DS652 & (2) SW6     | EDSC272       |                                     |
| Alternative              | (2) DSD634              | EDSC272       | External Sealing Fitting Required   |
| EDS2230                  | (2) DS652 & (2) SW7     | EDS272        |                                     |
| Alternative              | (2) DSD936              | EDS272        | External Sealing Fitting Required   |
| EDSC2230                 | (2) DS652 & (2) SW7     | EDSC272       |                                     |
| Alternative              | (2) DSD936              | EDSC272       | External Sealing Fitting Required   |
| EDSC2240                 | (2) DS652 & (2) SW8     | EDSC272       |                                     |
| Alternative              | (2) DSD937              | EDSC272       | External Sealing Fitting Required   |
| ROCKER SWITCHES          |                         |               |                                     |
| EDS2596                  | DSD949                  | EDS271        |                                     |
| EDSC2596                 | DSD949                  | EDSC271       |                                     |
| EDS2162                  | DSD951                  | EDS271        | Start/ Stop Legend included         |
| EDSC2162                 | DSD951                  | EDSC271       | Start/ Stop Legend included         |
| EDS2194                  | DSD950                  | EDS271        |                                     |
| EDSC2194                 | DSD950                  | EDSC271       |                                     |
| EDS2696                  | (2) DSD949              | EDS272        | Start/ Stop Legend included         |
| EDSC2696                 | (2) DSD949              | EDSC272       | Start/ Stop Legend included         |
| EDS2262                  | (2) DSD951              | EDS272        |                                     |
| EDSC2262                 | (2) DSD951              | EDSC272       |                                     |
| EDS2294                  | (2) DSD950              | EDS272        |                                     |
| EDSC2294                 | (2) DSD950              | EDSC272       |                                     |

#### Additional notes:

- See Eaton's Crouse-Hinds' installation instructions for any possible additional sealing requirements.
- Part numbers listed with 3/4" hub in back box (Ex. EDS2184). For 1/2" hub, change the "2" to "1" (EDS1184). For 1" hub, change the "2" to "3" (EDS3184).
- Control Stations with "Stop" legend have lockout provided as standard.
- Pilot Light Colors J"-- J1= Red, J3= Green, J6= Amber, J10= Clear, J11= Blue. LED pilot lights are available with LED suffix.
- Pilot Light Transformers for voltages over 125V. Suffix T2= 240/220 - 110V, T4= 480/440 - 110V, T5= 600/500 - 110V (not available on double pilot cover).
- Standard legend plate markings are available by adding nomenclature after the part number (EDS2184-Run).
- Selector switch nameplate kits available. 2-Pos = "SS2KIT", 3-Pos = "SS3KIT". See Replacement Parts book for additional information.
- Copper-free aluminum bodies and covers available with SA suffix.
- Additional control station options may be found in Section 4C.
- Group B ratings may be achieved by adding the GB suffix or using the EFS back box. See part number instructions for the item required.
- Group B ratings may already be achieved when used in Class I, Division 2 applications. See Certifications and Compliances for item required.
- Additional control station configurations available through the FlexStation Component Series.

MC and MCC Series

NEMA 3, 4  
Watertight

4C

Pushbutton Stations, Selector Switches  
and Pilot Lights  
600 VAC Heavy Duty

Applications:

MC pushbuttons or selector switches are used:

- In conjunction with magnetic starters or contactors for remote control of motors

MC pilot lights are used:

- To visually indicate at a remote point that the desired function is being performed (motor running, etc.)

MC pushbuttons, selector switches or pilot lights are used:

- In damp, wet or corrosive locations such as dairies, meat packing plants, chemical plants and outdoor locations

Features:

- Enclosures are compact in design, and gasketed to meet NEMA/EEMAC 3 or 4 requirements as noted in catalog listings
- Pushbutton stations with side rocker handle are furnished with a lockout arrangement on "STOP" position as standard
- Dead end (MC) or through feed (MCC) hubs - 1/2" and 3/4" sizes - with mounting feet
- Standard lockout on "STOP" and "OFF" button on front operated pushbutton covers
- Standard lockout on selector switch covers. Locks two or three position switch handle in any position.

Certifications and  
Compliances:

- NEMA/EEMAC 3, 4
- UL Standard: 508
- CSA Encl. 3, 4, 5

Standard Materials:

- Bodies - Feraloy® iron alloy
- Cover with side rocker handle - copper-free aluminum
- Front pushbutton, selector switch and pilot light covers - Feraloy iron alloy
- Rocker handle and pushbutton guards - type 6 / 6 nylon
- Selector switch handle - copper-free aluminum
- Operating shafts - stainless steel

Standard Finishes:

- Feraloy iron alloy - electrogalvanized and aluminum acrylic paint
- Copper-free aluminum - natural
- Type 6 / 6 nylon - black
- Stainless steel - natural

Options:

The following special options are available by adding suffix to Cat. #:

Description

Suffix

Lockout provision on front operated pushbutton (standard on buttons marked "OFF" and "STOP").....

S153

Neoprene covers for front operated pushbuttons. Meets NEMA 4 requirements and prevents accumulation of dirt around operating shafts.....

S323

Three-position selector switches with modified operation:

    Momentary contact clockwise operation, spring return to center, maintained contact counter-clockwise operation.....

S634

    Momentary contact counter-clockwise operation, spring return to center, maintained contact clockwise operation.....

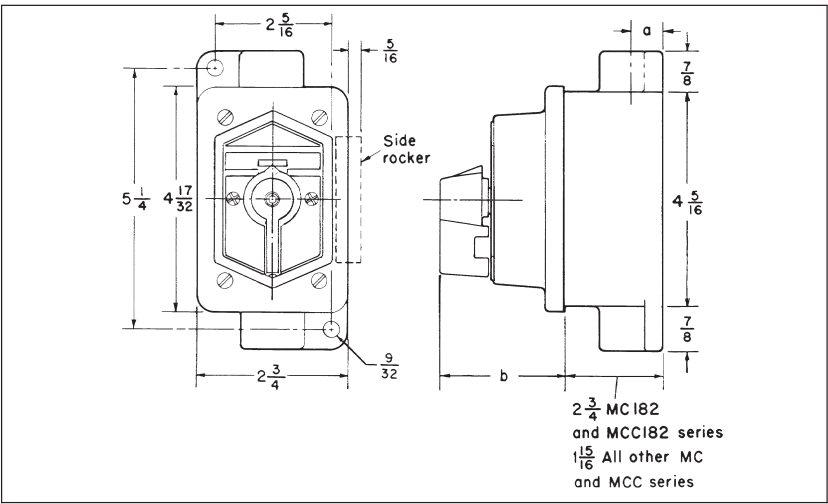
S635

Multiple gang bodies. Two gang, two gang tandem and three, four or five gang bodies can be supplied with combinations of single gang devices.....

Specify  
LED

Dimensions

In Inches\*:



| Hub size | a   | Type of Cover      | b      |
|----------|-----|--------------------|--------|
| 1/2      | 5/8 | Side Rocker Handle | 1 1/2  |
| 3/4      | 3/4 | Front Pushbutton   | 2 3/8  |
|          |     | Selector Switch    | 2 3/8  |
|          |     | Pilot Light        | 1 1/16 |

\*Dimensions are approximate, not for construction purposes.

Pushbutton Stations, Selector Switches  
and Pilot Lights  
600 VAC Heavy DutyMC dead end  
side rocker handleMCC through feed  
side rocker handleMC dead end  
front pushbuttonMCC through feed  
front pushbutton

## Ordering Information - With Side Rocker Handles

Watertight, NEMA 3, 4

| Normal Positions                      | Marking   | Diagram | Replacement Contact Blocks‡ | Enclosure with Rocker Handles |                          |                            |
|---------------------------------------|-----------|---------|-----------------------------|-------------------------------|--------------------------|----------------------------|
|                                       |           |         |                             | Hub Size                      | Dead End Cat. #          | Through Feed Cat. #        |
| 1 Circuit Universal                   | Specify   |         | ED11                        | 1/2<br>3/4                    | MC1810U1 ①<br>MC2810U1 ① | MCC1810U1 ①<br>MCC2810U1 ① |
| 2 Circuits Universal                  | Specify   |         | ED12                        | 1/2<br>3/4                    | MC1810U ①<br>MC2810U ①   | MCC1810U ①<br>MCC2810U ①   |
| START-STOP unless otherwise specified |           |         |                             |                               |                          |                            |
| 2 Circuits                            |           |         |                             |                               |                          |                            |
| 1 Open - A                            | otherwise |         | ED12*                       | 1/2<br>3/4                    | MC1810 ①<br>MC2810 ①     | MCC1810 ①<br>MCC2810 ①     |
| 1 Closed - B                          | specified |         |                             |                               |                          |                            |

## Ordering Information - With Front Pushbuttons

Weather Resistant, NEMA 3 §

| Normal Positions                      | Marking   | Diagram | Replacement Contact Blocks‡ | Enclosure with Pushbuttons |                          |                            |
|---------------------------------------|-----------|---------|-----------------------------|----------------------------|--------------------------|----------------------------|
|                                       |           |         |                             | Hub Size                   | Dead End Cat. #          | Through Feed Cat. #        |
| 1 Circuit Universal                   | Specify   |         | ED11                        | 1/2<br>3/4                 | MC1910U1 ①<br>MC2910U1 ① | MCC1910U1 ①<br>MCC2910U1 ① |
| 2 Circuits Universal                  | Specify   |         | ED12                        | 1/2<br>3/4                 | MC1910U ①<br>MC2910U ①   | MCC1910U ①<br>MCC2910U ①   |
| START-STOP unless otherwise specified |           |         |                             |                            |                          |                            |
| 2 Circuits                            |           |         |                             |                            |                          |                            |
| 1 Open - A                            | otherwise |         | ED12*                       | 1/2<br>3/4                 | MC1910 ①<br>MC2910 ①     | MCC1910 ①<br>MCC2910 ①     |
| 1 Closed - B                          | specified |         |                             |                            |                          |                            |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

\*Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

§ For Watertight NEMA 4 rating, use suffix S323 (Neoprene button covers). See Options section.

‡For replacement pushbuttons see page 571.

## Pushbutton Stations, Selector Switches and Pilot Lights 600 VAC Heavy Duty



MC dead end  
selector switch

### Ordering Information - Selector Switches

Furnished with pushbutton contact blocks, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below.

| Maintained Contact             |            |            |            | Enclosure with Selector Switch |            |                 |                     |
|--------------------------------|------------|------------|------------|--------------------------------|------------|-----------------|---------------------|
| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks*    | Hub Size   | Dead End Cat. # | Through Feed Cat. # |
| Two-Position, Two-Circuit      | A1         |            |            | ED11                           | 1/2<br>3/4 | MC11271 ①       | MCC11271 ①          |
|                                | A2         |            |            |                                |            | MC21271 ①       | MCC21271 ①          |
| Two-Position, Four-Circuit     | A1         |            |            | ED12                           | 1/2<br>3/4 | MC11272 ①       | MCC11272 ①          |
|                                | A2         |            |            |                                |            | MC21272 ①       | MCC21272 ①          |
|                                | B1         |            |            |                                |            |                 |                     |
|                                | B2         |            |            |                                |            |                 |                     |
| Three-Position, Two-Circuit †  | A1         |            |            | ED11                           | 1/2<br>3/4 | MC11273 ①       | MCC11273 ①          |
|                                | A2         |            |            |                                |            | MC21273 ①       | MCC21273 ①          |
| Three-Position, Four-Circuit † | A1         |            |            | ED12                           | 1/2<br>3/4 | MC11274 ①       | MCC11274 ①          |
|                                | A2         |            |            |                                |            | MC21274 ①       | MCC21274 ①          |
|                                | B1         |            |            |                                |            |                 |                     |
|                                | B2         |            |            |                                |            |                 |                     |
| Three-Position, Four-Circuit † | A1         |            |            | ED12                           | 1/2<br>3/4 | MC11275 ①       | MCC11275 ①          |
|                                | A2         |            |            |                                |            | MC21275 ①       | MCC21275 ①          |
|                                | B1         |            |            |                                |            |                 |                     |
|                                | B2         |            |            |                                |            |                 |                     |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |



MC dead end  
pilot light

### Ordering Information - Pilot Lights‡

| Enclosure with Jewel Cover and Lamp |              |            |          |                 |                     |
|-------------------------------------|--------------|------------|----------|-----------------|---------------------|
| Primary Voltage Range               | Lamp Base    | Lamp Watts | Hub Size | Dead End Cat. # | Through Feed Cat. # |
| 110-125                             | Candelabra   | 6          | 1/2      | MC180 J1        | MCC180 J1           |
| 110-125                             | Candelabra   | 6          | 3/4      | MC-280-J1       | MCC280 J1           |
| 220-250                             | Intermediate | 10         | 1/2      | MC184 J1        | MCC184 J1           |
| 220-250                             | Intermediate | 10         | 3/4      | MC-284-J1       | MCC284 J1           |
| 440-480                             | Candelabra   | 6          | 1/2      | MC182 J1        | MCC182 J1           |
| 440-480                             | Candelabra   | 6          | 3/4      | MC282 J1        | MCC282 J1           |

\* For replacement contact blocks see page 571.

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

‡ LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED after color symbol (J1).



4C

## N2S and N2SC Series Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

### Applications:

N2S and N2SC pushbutton stations, selector switches and pilot lights are suitable for use:

- In Class I, Groups B, C, D; Division 2 hazardous areas where flammable vapors or gases may be present due to accidental or abnormal operation
- In damp, wet, or corrosive locations
- Indoors or outdoors in Division 2 areas of petroleum refineries, chemical plants and other process industry facilities where similar hazards exist

N2S and N2SC pushbutton stations and selector switches are used:

- In conjunction with magnetic starters or contactors for remote control of motors
- N2S and N2SC pilot lights are used:
- To visually indicate at a remote location that the desired function is being performed

Optional maintained stop pushbutton(s) are used: As emergency or normal stop button(s) in motor control circuits for positive shutdown.

### Features:

- Pushbutton stations, pilot lights, and selector switch devices are factory sealed. External seals are not required.
- Enclosures are made of Krydon® fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat and sunlight.
- Optional maintained stop feature operates by depressing the mushroom head pushbutton. Pushbutton must be manually pulled before start button can be actuated.
- Lockout is standard on selector switch devices.
- Factory installed dead end (N2S) or through feed (N2SC) hubs – 1/2", 3/4", and 1" sizes.
- Indicating plates are available with a choice of 40 standard markings.
- Grounding plate included with each hub.

### Certifications and Compliances:

- NEC:
  - Class I, Division 2, Groups B, C & D
- NEMA: 3, 4X, 7BCD (Division 2) and 12
- UL Standard: 1203
- CSA Standard: C22.2 Nos. 14 & 30

### Electrical Rating Ranges:

- Pushbutton stations and selector switches – heavy duty 600 VAC maximum
- Pilot lights – 120 to 600 VAC



### Options:

The following special options are available from factory by adding suffix to Cat. #:

#### Description

Padlock attachments for all pushbuttons. For "START-STOP" stations, only "STOP" button provided with lockout (lockout standard with STOP)..... **S708**

#### Three position selector switches with modified operation:

Momentary contact clockwise operation, spring return to center, maintained contact counterclockwise operation ..... **S634**

Momentary contact counterclockwise operation, spring return to center, maintained contact clockwise operation ..... **S635**

#### Control station with maintained stop pushbutton (requires NCD type enclosure):

One maintained stop pushbutton ..... **MSR1**

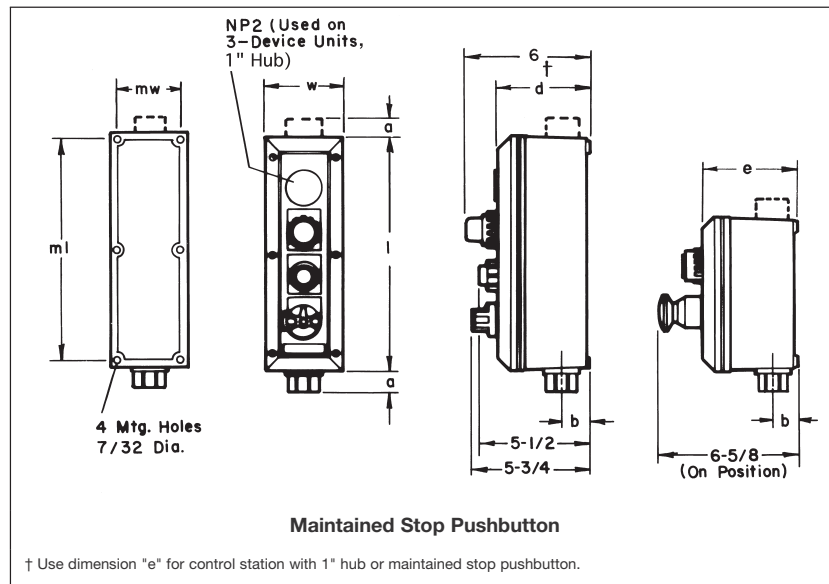
Two maintained stop pushbuttons ..... **MSR2**

Maintained stop pushbuttons are installed at bottom position(s) of control station unless otherwise specified.

LED pilot lights in place of standard incandescent pilot lamps ..... **LED**

### Dimensions

#### In Inches:



Dimensions are approximate, not for construction purposes.

| N2S(C)<br>Body<br>Style | Outside<br>Dims.<br>l | w       | (NCS)*<br>d | (NCD)*<br>e | Mounting<br>Dims.<br>ml | mw      | 1/2" & 3/4"<br>Hubs<br>a b | 1"<br>Hubs<br>a b |
|-------------------------|-----------------------|---------|-------------|-------------|-------------------------|---------|----------------------------|-------------------|
| 1 or 2<br>devices       | 7 1/4                 | 3 13/16 | 4 3/8       | 5 3/8       | 6 3/8                   | 2 15/16 | 1 1/8 1 1/16               | 1 1/4 1 5/16      |
| 3 or 4<br>devices       | 11 1/4                | 3 13/16 | 4 3/8       | 5 3/8       | 10 7/8                  | 2 15/16 | 1 1/8 1 1/16               | 1 1/4 1 5/16      |

\*NCS box is supplied with units using 1/2" and 3/4" hubs. NCD box is supplied with units using 1" hubs or MSR option.

‡ NCD 4 device box used with 1" hubs or MSR option.

**Crouse-Hinds**  
by **Eaton**



# N2S and N2SC Series Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

4C

## Ordering Information - With Pilot Lights†\*

| No.<br>Units | Diagram | Volts | Enclosure with Pilot Lights<br>1/2" Hubs |                        | 3/4" Hubs          |                        | 1" Hubs            |                        |
|--------------|---------|-------|------------------------------------------|------------------------|--------------------|------------------------|--------------------|------------------------|
|              |         |       | Dead End<br>Cat. #                       | Through<br>Feed Cat. # | Dead End<br>Cat. # | Through<br>Feed Cat. # | Dead End<br>Cat. # | Through<br>Feed Cat. # |
| 1            |         | 120   | N2S1131 ①                                | N2SC1131 ①             | N2S2131 ①          | N2SC2131 ①             | N2S3131 ①          | N2SC3131 ①             |
|              |         | 240   | N2S1132 ①                                | N2SC1132 ①             | N2S2132 ①          | N2SC2132 ①             | N2S3132 ①          | N2SC3132 ①             |
|              |         | 480   | N2S1134 ①                                | N2SC1134 ①             | N2S2134 ①          | N2SC2134 ①             | N2S3134 ①          | N2SC3134 ①             |
|              |         | 600   | N2S1135 ①                                | N2SC1135 ①             | N2S2135 ①          | N2SC2135 ①             | N2S3135 ①          | N2SC3135 ①             |
| 2            |         | 120   | N2S1231 ①                                | N2SC1231 ①             | N2S2231 ①          | N2SC2231 ①             | N2S3231 ①          | N2SC3231 ①             |
|              |         | 240   | N2S1232 ①                                | N2SC1232 ①             | N2S2232 ①          | N2SC2232 ①             | N2S3232 ①          | N2SC3232 ①             |
|              |         | 480   | N2S1234 ①                                | N2SC1234 ①             | N2S2234 ①          | N2SC2234 ①             | N2S3234 ①          | N2SC3234 ①             |
|              |         | 600   | N2S1235 ①                                | N2SC1235 ①             | N2S2235 ①          | N2SC2235 ①             | N2S3235 ①          | N2SC3235 ①             |
| 3            |         | 120   | N2S1331 ①                                | N2SC1331 ①             | N2S2331 ①          | N2SC2331 ①             | N2S3331 ①          | N2SC3331 ①             |
|              |         | 240   | N2S1332 ①                                | N2SC1332 ①             | N2S2332 ①          | N2SC2332 ①             | N2S3332 ①          | N2SC3332 ①             |
|              |         | 480   | N2S1334 ①                                | N2SC1334 ①             | N2S2334 ①          | N2SC2334 ①             | N2S3334 ①          | N2SC3334 ①             |
|              |         | 600   | N2S1335 ①                                | N2SC1335 ①             | N2S2335 ①          | N2SC2335 ①             | N2S3335 ①          | N2SC3335 ①             |
| 4            |         | 120   | N2S1431 ①                                | N2SC1431 ①             | N2S2431 ①          | N2SC2431 ①             | N2S3431 ①          | N2SC3431 ①             |
|              |         | 240   | N2S1432 ①                                | N2SC1432 ①             | N2S2432 ①          | N2SC2432 ①             | N2S3432 ①          | N2SC3432 ①             |
|              |         | 480   | N2S1434 ①                                | N2SC1434 ①             | N2S2434 ①          | N2SC2434 ①             | N2S3434 ①          | N2SC3434 ①             |
|              |         | 600   | N2S1435 ①                                | N2SC1435 ①             | N2S2435 ①          | N2SC2435 ①             | N2S3435 ①          | N2SC3435 ①             |

## Ordering Information - With Selector Switches

| Style                             | Switch Position |   |   | Marking<br>Unless<br>Otherwise<br>Specified | Enclosure With Selector Switch |                    |                        |
|-----------------------------------|-----------------|---|---|---------------------------------------------|--------------------------------|--------------------|------------------------|
|                                   | 1               | 2 | 3 |                                             | Hub<br>Size                    | Dead End<br>Cat. # | Through Feed<br>Cat. # |
| Two-Position,<br>Two-Circuit      | A1              |   |   | START-STOP<br>(or Specify)                  | 1/2                            | N2S1121 ②          | N2SC1121 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2121 ②          | N2SC2121 ②             |
| Two-Position,<br>Four-Circuit     | A1              |   |   | START-STOP<br>(or Specify)                  | 1/2                            | N2S1122 ②          | N2SC1122 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2122 ②          | N2SC2122 ②             |
| Three-Position,<br>Two-Circuit †  | A1              |   |   | Specify                                     | 1/2                            | N2S1123 ②          | N2SC1123 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2123 ②          | N2SC2123 ②             |
| Three-Position,<br>Four-Circuit † | A1              |   |   | Specify                                     | 1/2                            | N2S1124 ②          | N2SC1124 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2124 ②          | N2SC2124 ②             |
| Three-Position,<br>Four-Circuit † | A1              |   |   | Specify                                     | 1/2                            | N2S1125 ②          | N2SC1125 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2125 ②          | N2SC2125 ②             |

① Specify lens color for each pilot light. As an example, N2S1231 with one red and one green would be ordered as N2S1231-J1-J3.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Marking

|              |         |                                   |                                     |
|--------------|---------|-----------------------------------|-------------------------------------|
| Pushbuttons: | REVERSE | Selector Switches – Two-Position: | Selector Switches – Three-Position: |
| START        | OPEN    | RUN-JOG                           | RUN-OFF-JOG                         |
| STOP         | CLOSE   | HAND-AUTO                         | HAND-OFF-AUTO                       |
| ON           | UP      | FOR-REV                           | FOR-OFF-REV                         |
| OFF          | DOWN    | FAST-SLOW                         | FAST-OFF-SLOW                       |
| RUN          | IN      | OPEN-CLOSE                        | 1-OFF-2                             |
| JOG          | OUT     | UP-DOWN                           | OPEN-OFF-CLOSE                      |
| TRIP         | RAISE   | ON-OFF                            | UP-OFF-DOWN                         |
| RESET        | LOWER   | IN-OUT                            |                                     |
| TEST         |         | RAISE-LOWER                       |                                     |
| LIGHT ON     |         | START-STOP                        |                                     |
| HAND         |         |                                   |                                     |
| AUTOMATIC    |         |                                   |                                     |
| EMERGENCY    |         |                                   |                                     |
| FORWARD      |         |                                   |                                     |

† Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

\* LED pilot lights are available. Add suffix LED after last color symbol. See Options Sections for more information.

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

## Crouse-Hinds

by **E.T.N**

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545

4C

# N2S and N2SC Series Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

## Ordering Information - With Pushbuttons – Momentary Contact

| No. Units | Contact Symbol                                                                                                                                                                                                                                                                                                                          | Marking Unless Otherwise Specified | Enclosure with Pushbuttons |                 |                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------|-----------------|---------------------|
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | Hub Size                   | Dead End Cat. # | Through Feed Cat. # |
| 1         |                                                                                                                                                                                                                                                        | START<br>(or Specify)              | 1/2                        | N2S1110 ②       | N2SC1110 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2110 ②       | N2SC2110 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3110 ②       | N2SC3110 ②          |
| 2         |                                                                                                                                                                       | START-STOP<br>(or Specify)         | 1/2                        | N2S1210 ②       | N2SC1210 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2210 ②       | N2SC2210 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3210 ②       | N2SC3210 ②          |
| 3         |                                                                                      | Specify                            | 1/2                        | N2S1310 ②       | N2SC1310 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2310 ②       | N2SC2310 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3310 ②       | N2SC3310 ②          |
| 4         |     | Specify                            | 1/2                        | N2S1410 ②       | N2SC1410 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2410 ②       | N2SC2410 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3410 ②       | N2SC3410 ②          |

## Ordering Information - Combination Control Stations

### Enclosure With Pushbuttons and Pilot Lights

| Pilot Lights* | Pushbuttons | Diagram                                                                                                                                                                 | Markings | Hub Size | Volts | Dead End Cat. # | Through Feed Cat. # | Volts | Dead End Cat. # | Through Feed Cat. # |
|---------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------|-----------------|---------------------|-------|-----------------|---------------------|
| 1             | 1           |                                                                                        | Specify  | 1/2      | 120   | N2S12411 ①②     | N2SC12411 ①②        | 480   | N2S12414 ①②     | N2SC12414 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 120   | N2S22411 ①②     | N2SC22411 ①②        |       | N2S22414 ①②     | N2SC22414 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 120   | N2S32411 ①②     | N2SC32411 ①②        |       | N2S32414 ①②     | N2SC32414 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S12412 ①②     | N2SC12412 ①②        | 600   | N2S12415 ①②     | N2SC12415 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 240   | N2S22412 ①②     | N2SC22412 ①②        |       | N2S22415 ①②     | N2SC22415 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 240   | N2S32412 ①②     | N2SC32412 ①②        |       | N2S32415 ①②     | N2SC32415 ①②        |
| 1             | 2           |                                                                                      | Specify  | 1/2      | 120   | N2S13421 ①②     | N2SC13421 ①②        | 480   | N2S13424 ①②     | N2SC13424 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 120   | N2S23421 ①②     | N2SC23421 ①②        |       | N2S23424 ①②     | N2SC23424 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 120   | N2S33421 ①②     | N2SC33421 ①②        |       | N2S33424 ①②     | N2SC33424 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S13422 ①②     | N2SC13422 ①②        | 600   | N2S13425 ①②     | N2SC13425 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 240   | N2S23422 ①②     | N2SC23422 ①②        |       | N2S23425 ①②     | N2SC23425 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 240   | N2S33422 ①②     | N2SC33422 ①②        |       | N2S33425 ①②     | N2SC33425 ①②        |
| 2             | 1           |   | Specify  | 1/2      | 120   | N2S13411 ①②     | N2SC13411 ①②        | 480   | N2S13414 ①②     | N2SC13414 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 120   | N2S23411 ①②     | N2SC23411 ①②        |       | N2S23414 ①②     | N2SC23414 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 120   | N2S33411 ①②     | N2SC33411 ①②        |       | N2S33414 ①②     | N2SC33414 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S13412 ①②     | N2SC13412 ①②        | 600   | N2S13415 ①②     | N2SC13415 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 240   | N2S23412 ①②     | N2SC23412 ①②        |       | N2S23415 ①②     | N2SC23415 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 240   | N2S33412 ①②     | N2SC33412 ①②        |       | N2S33415 ①②     | N2SC33415 ①②        |
| 2             | 2           |   | Specify  | 1/2      | 120   | N2S14421 ①②     | N2SC14421 ①②        | 480   | N2S14424 ①②     | N2SC14424 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 120   | N2S24421 ①②     | N2SC24421 ①②        |       | N2S24424 ①②     | N2SC24424 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 120   | N2S34421 ①②     | N2SC34421 ①②        |       | N2S34424 ①②     | N2SC34424 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S14422 ①②     | N2SC14422 ①②        | 600   | N2S14425 ①②     | N2SC14425 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      | 240   | N2S24422 ①②     | N2SC24422 ①②        |       | N2S24425 ①②     | N2SC24425 ①②        |
|               |             |                                                                                                                                                                         |          | 1        | 240   | N2S34422 ①②     | N2SC34422 ①②        |       | N2S34425 ①②     | N2SC34425 ①②        |

① See pages 545–547

② See pages 545–547

‡ Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

# N2S and N2SC Series Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

4C

## Ordering Information - Combination Control Stations

|                                                                                   |                                                                                   | Selector Switches Position No.†                                                      |                                                                                      |   | Enclosure With Pilot Light, Pushbuttons and Selector Switch |          |       |                 |                     |       |                 |                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---|-------------------------------------------------------------|----------|-------|-----------------|---------------------|-------|-----------------|---------------------|
| Pilot Lights*‡                                                                    | Push buttons                                                                      | 1                                                                                    | 2                                                                                    | 3 | Markings                                                    | Hub Size | Volts | Dead End Cat. # | Through Feed Cat. # | Volts | Dead End Cat. # | Through Feed Cat. # |
| 1                                                                                 | 2                                                                                 | 2-Pos, 2-Cct                                                                         |                                                                                      |   |                                                             | 1/2      |       | N2S145211 ①②    | N2SC145211 ①②       |       | N2S145214 ①②    | N2SC145214 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 3/4      | 120   | N2S245211 ①②    | N2SC245211 ①②       | 480   | N2S245214 ①②    | N2SC245214 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 1        |       | N2S345211 ①②    | N2SC345211 ①②       |       | N2S345214 ①②    | N2SC345214 ①②       |
|  |  | A1  | A2  |   | Specify                                                     | 1/2      |       | N2S145212 ①②    | N2SC145212 ①②       |       | N2S145215 ①②    | N2SC145215 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 3/4      | 240   | N2S245212 ①②    | N2SC245212 ①②       | 600   | N2S245215 ①②    | N2SC245215 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 1        |       | N2S345212 ①②    | N2SC345212 ①②       |       | N2S345215 ①②    | N2SC345215 ①②       |
| 1                                                                                 | 2                                                                                 | 3-Pos, 2-Cct                                                                         |                                                                                      |   |                                                             | 1/2      |       | N2S145231 ①②    | N2SC145231 ①②       |       | N2S145234 ①②    | N2SC145234 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 3/4      | 120   | N2S245231 ①②    | N2SC245231 ①②       | 480   | N2S245234 ①②    | N2SC245234 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 1        |       | N2S345231 ①②    | N2SC345231 ①②       |       | N2S345234 ①②    | N2SC345234 ①②       |
|  |  | A1  | A2  |   | Specify                                                     | 1/2      |       | N2S145232 ①②    | N2SC145232 ①②       |       | N2S145235 ①②    | N2SC145235 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 3/4      | 240   | N2S245232 ①②    | N2SC245232 ①②       | 600   | N2S245235 ①②    | N2SC245235 ①②       |
|                                                                                   |                                                                                   |                                                                                      |                                                                                      |   |                                                             | 1        |       | N2S345232 ①②    | N2SC345232 ①②       |       | N2S345235 ①②    | N2SC345235 ①②       |

① Specify lens color for each pilot light. As an example, N2S1231 with one red and one green would be ordered as N2S1231-J1-J3.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

| Marking      |         |                                   |                                     |
|--------------|---------|-----------------------------------|-------------------------------------|
| Pushbuttons: | REVERSE | Selector Switches – Two-Position: | Selector Switches – Three-Position: |
| START        | OPEN    |                                   |                                     |
| STOP         | CLOSE   | RUN-JOG                           | RUN-OFF-JOG                         |
| ON           | UP      | HAND-AUTO                         | HAND-OFF-AUTO                       |
| OFF          | DOWN    | FOR-REV                           | FOR-OFF-REV                         |
| RUN          | IN      | FAST-SLOW                         | FAST-OFF-SLOW                       |
| JOG          | OUT     | OPEN-CLOSE                        | 1-OFF-2                             |
| TRIP         | RAISE   | UP-DOWN                           | OPEN-OFF-CLOSE                      |
| RESET        | LOWER   | ON-OFF                            | UP-OFF-DOWN                         |
| TEST         |         | IN-OUT                            |                                     |
| LIGHT ON     |         | RAISE-LOWER                       |                                     |
| HAND         |         | START-STOP                        |                                     |
| AUTOMATIC    |         |                                   |                                     |
| EMERGENCY    |         |                                   |                                     |
| FORWARD      |         |                                   |                                     |

‡ Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

\* LED pilot lights are available. Add suffix LED after last color symbol. See Options Sections for more information.

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

Crouse-Hinds

by E.T.N

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4C

## N2S and N2SC Series Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

### Ordering Information - Custom-Built, Factory Assembled Control Stations

To order your custom-built factory assembled control station, select the enclosure required and add the desired devices from listings below.

Custom-built factory assembled control stations may thus be ordered as follows:

#### Requirements:

3-device control station on *Krydon*® material enclosure with 3/4" through feed hubs, with 1 pilot light with green jewel, rated at 120V; 1 three position, two circuit selector switch marked HAND-OFF-AUTO; and 1 green single circuit pushbutton marked START.

#### ORDER:

NCDC23FA

N2P310-J3

N2SW11311-HAND-OFF-AUTO

N2PS1111G-START

Pilot light jewel symbol, pushbutton and selector switch plate markings are selected from footnote tables. Suffix FA indicates factory assembled.

Note that order of assembly of control stations should be listed in desired mounting order, reading from top to bottom of enclosure.

### Enclosures (NCD or NCDC enclosures must be used with MSR1 or MSR2)

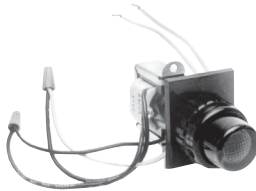
| No. of Devices | Without Hubs<br>Cat. # | With One Hub 1/2"<br>Cat. # | With Two Hub 1/2"<br>Cat. # | With One Hub 3/4"<br>Cat. # | With Two Hub 3/4"<br>Cat. # | With One Hub 1"<br>Cat. # | With Two Hub 1"<br>Cat. # |
|----------------|------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------|---------------------------|
| 1              | NCD01                  | NCD11                       | NCDC11                      | NCD21                       | NCDC21                      | NCD31                     | NCDC31                    |
| 2              | NCD02                  | NCD12                       | NCDC12                      | NCD22                       | NCDC22                      | NCD32                     | NCDC32                    |
| 3              | NCD03                  | NCD13                       | NCDC13                      | NCD23                       | NCDC23                      | NCD33                     | NCDC33                    |
| 4              | NCD04                  | NCD14                       | NCDC14                      | NCD24                       | NCDC24                      | NCD34                     | NCDC34                    |

| No. of Devices | Without Hubs<br>Cat. # | With One Hub (3/4")<br>Cat. # | With Two Hub (3/4")<br>Cat. # | With One Hub (1/2")<br>Cat. # | With Two Hub (1/2")<br>Cat. # |
|----------------|------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1              | NCS01                  | NCS21                         | NCSC21                        | NCS11                         | NCSC11                        |
| 2              | NCS02                  | NCS22                         | NCSC22                        | NCS12                         | NCSC12                        |
| 3              | NCS03                  | NCS23                         | NCSC23                        | NCS13                         | NCSC13                        |
| 4              | NCS04                  | NCS24                         | NCSC24                        | NCS14                         | NCSC14                        |

### Pilot Lights†\* Transformer Type

| Volts | Cat. #   |
|-------|----------|
| 120   | N2PL10 ① |
| 240   | N2PL20 ① |
| 480   | N2PL40 ① |
| 600   | N2PL50 ① |



### Pilot lights to be used in N2SU Series:

|       |                 |
|-------|-----------------|
| Red   | N2PLU10 J1 LED  |
| Green | N2PLU10 J3 LED  |
| Amber | N2PLU10 J6 LED  |
| Clear | N2PLU10 J10 LED |
| Blue  | N2PLU10 J11 LED |

① Specify lens color for each pilot light using symbols below.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

† Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

\* LED pilot lights are available. Add suffix LED after last color symbol. See Options Sections for more information.

N2S and N2SC Series  
Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

4C

Pushbutton Stations – Momentary Contact

| Color of Operator | 1 Circuit      |                  | 2 Circuit      |                  |
|-------------------|----------------|------------------|----------------|------------------|
|                   | Contact Symbol | Universal Cat. # | Contact Symbol | Universal Cat. # |
| Natural           |                | N2PS1111 ②       |                | N2PS1211 ②       |
| Red               |                | N2PS1111R ②      |                | N2PS1211R ②      |
| Green             |                | N2PS1111G ②      |                | N2PS1211G ②      |
| Red Mushroom Head |                | N2PM1111 S111 ②  |                |                  |



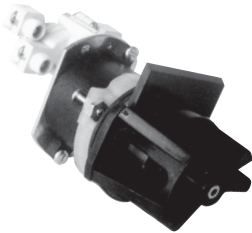
Closure Plug



| Description  | Cat. # |
|--------------|--------|
| Closure Plug | NP2    |

Selector Switches

| Style                            | Position 1           | Position 2 | Position 3 | Cat. #      |
|----------------------------------|----------------------|------------|------------|-------------|
| Two Position<br>Two Circuit      | A1<br>A2             |            |            | N2SW11211 ② |
| Two Position<br>Four Circuit     | A1<br>A2<br>B1<br>B2 |            |            | N2SW12221 ② |
| Three Position<br>Two Circuit †  | A1<br>A2             |            |            | N2SW11311 ② |
| Three Position<br>Four Circuit † | A1<br>A2<br>B1<br>B2 |            |            | N2SW12321 ② |
| Three Position<br>Four Circuit † | A1<br>A2<br>B1<br>B2 |            |            | N2SW12322 ② |



② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

Marking

|              |         |                     |                     |
|--------------|---------|---------------------|---------------------|
| Pushbuttons: | REVERSE | Selector Switches – | Selector Switches – |
| START        | OPEN    | Two-Positions:      | Three-Position:     |
| STOP         | CLOSE   | RUN-JOG             | RUN-OFF-JOG         |
| ON           | UP      | HAND-AUTO           | HAND-OFF-AUTO       |
| OFF          | DOWN    | FOR-REV             | FOR-OFF-REV         |
| RUN          | IN      | FAST-SLOW           | FAST-OFF-SLOW       |
| JOG          | OUT     | OPEN-CLOSE          | 1-OFF-2             |
| TRIP         | RAISE   | UP-DOWN             | OPEN-OFF-CLOSE      |
| RESET        | LOWER   | ON-OFF              | UP-OFF-DOWN         |
| TEST         |         | IN-OUT              |                     |
| LIGHT ON     |         | RAISE-LOWER         |                     |
| HAND         |         | START-STOP          |                     |
| AUTOMATIC    |         |                     |                     |
| EMERGENCY    |         |                     |                     |
| FORWARD      |         |                     |                     |

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

4C

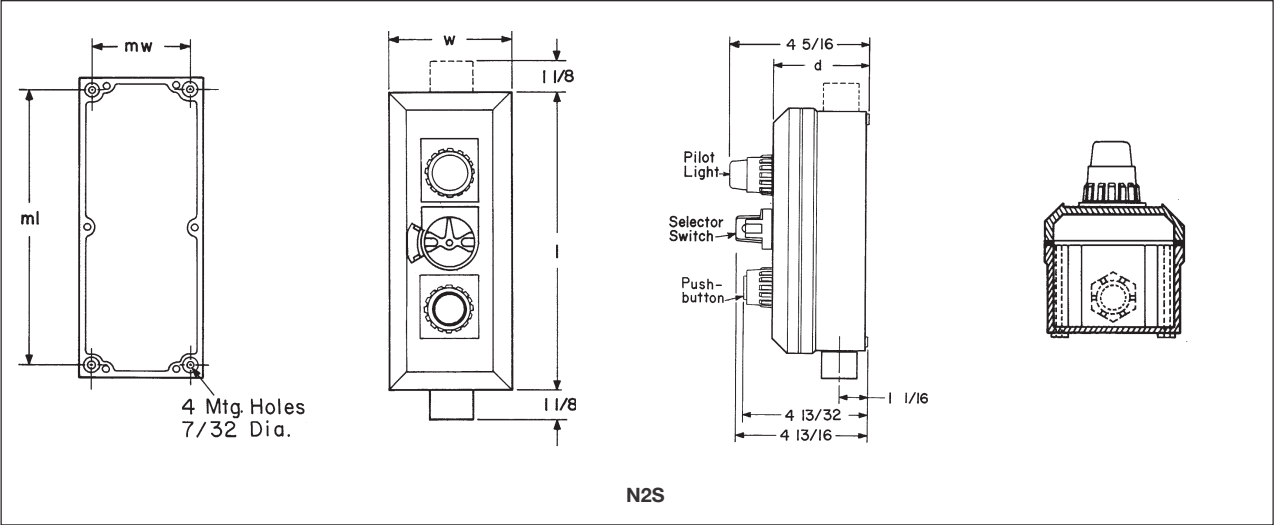
4C

N2S and N2SC Series  
Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

Dimensions  
In Inches:



For 1/2" and 3/4" hub sizes (for 1" hub and/or MSR option, see page 544).

| NCS(C) Body Style | Outside Dimensions |         |       | Mounting Dimensions |         |
|-------------------|--------------------|---------|-------|---------------------|---------|
|                   | l                  | w       | d     | ml                  | mw      |
| 1 device          | 7 1/4              | 3 13/16 | 4 3/8 | 6 3/8               | 2 15/16 |
| 2 devices         | 7 1/4              | 3 13/16 | 4 3/8 | 6 3/8               | 2 15/16 |
| 3 devices         | 9 1/2              | 3 13/16 | 4 3/8 | 8 3/8               | 2 15/16 |
| 4 devices         | 11 3/4             | 3 13/16 | 4 3/8 | 10 7/8              | 2 15/16 |

# N2SU/N2SCU Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

**4C**

## Applications:

N2SU and N2SCU pushbutton stations, selector switches and pilot lights are suitable for use:

- In Class I, Groups B, C, D; Division 2 and Class I, Zones 1 and 2 hazardous areas where flammable vapors or gases may be present due to accidental or abnormal operation
- In damp, wet, or corrosive locations
- Indoors or outdoors in Division 2 and Class I, Zones 1 and 2 areas of petroleum refineries, chemical plants and other process industry facilities where similar hazards exist

N2SU and N2SCU pushbutton stations and selector switches are used:

- In conjunction with magnetic starters or contactors for remote control of motors

N2SU and N2SCU pilot lights are used:

- To visually indicate at a remote location that the desired function is being performed

Optional maintained stop pushbutton(s) are used: As emergency or normal stop button(s) in motor control circuits for positive shutdown.

## Features:

- Compact, strong, durable enclosures are made of *Vestamid*™ – a black molded high impact strength, polyester material having excellent corrosion resistance and stability to heat.
- Exterior parts of pushbuttons, pilot lights, and selector switches are made of *Krydon* material. See pages 552–553 for device part numbers
- Pushbutton design uses a unique internal neoprene boot which completely encloses all internal parts. A wiping gasket around the pushbutton cleans the wall of the pushbutton guard of any foreign material accumulation as the button is operated.
- Formed-in-place gasket, and stainless steel screws for added corrosion resistance.
- Pushbutton and pilot light guards are fluted for no-slip installation.
- Factory installed dead end (N2SU) or through feed (N2SCU) hubs – 1/2" and 3/4" sizes.
- Legend plates are available with 40 standard markings.
- Lockout is standard on selector switch devices.
- LED lamps are standard to provide longer life.

## Certifications and Compliances:

- NEMA: 3, 4X, 7BCD and 12
- UL Standard: 508
- CSA C22.2 No. 14 & 30

## Crouse-Hinds

by **E•T•N**

## Size Ranges:

- 1, 2, 3 and 4-device units

## Electrical Rating Ranges:

- Pushbutton stations and selector switches – heavy duty 600VAC maximum
- Pilot lights – 120 to 600 VAC

## Options:

### Description

Padlock attachments for all pushbuttons. For "START-STOP" stations, only "STOP" button provided with lockout (lockout standard with STOP).....

**Suffix**

**S708**

### Three-position selector switches with modified operation:

Momentary contact clockwise operation, spring return to center, maintained contact counterclockwise operation.....

**S634**

Momentary contact counterclockwise operation, spring return to center, maintained contact clockwise operation.....

**S635**

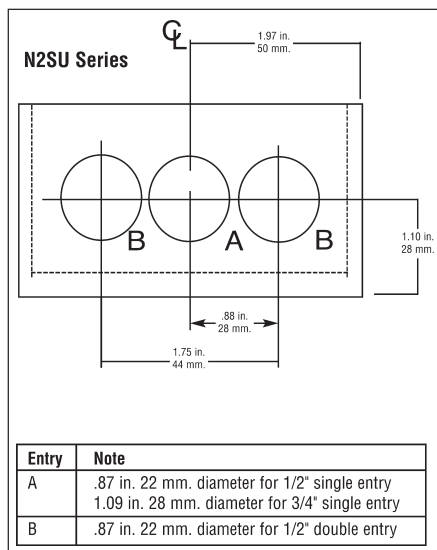
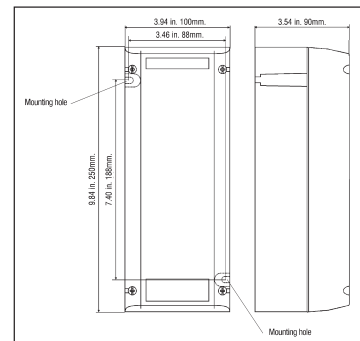
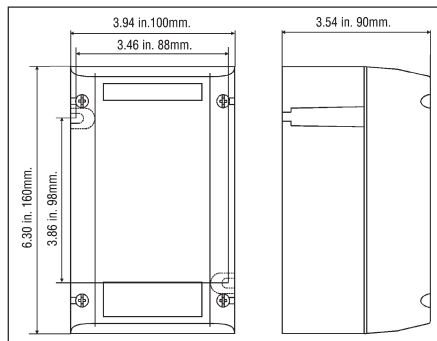
One maintained stop pushbutton.....

**MSR1**

**Note:** In addition to hub arrangements shown, the following can be obtained by inserting these codes for the 4th and 5th character in the catalog number:  
D = Double 1/2" hubs at bottom  
CD = Single hub at top, double 1/2" hubs at bottom  
DD = Double 1/2" hubs at each end

## Dimensions

### In Inches:





# 4C N2SU/N2SCU Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

## Ordering Information - With Pushbuttons – Momentary Contact

| No. Units | Contact Symbol | Marking Unless Otherwise Specified | Enclosure with Pushbuttons |                          |                            |
|-----------|----------------|------------------------------------|----------------------------|--------------------------|----------------------------|
|           |                |                                    | Hub Size                   | Dead End Cat. #          | Through Feed Cat. #        |
| 1         |                | START<br>(or Specify)              | 1/2<br>3/4                 | N2S1110U ②<br>N2S2110U ② | N2SC1110U ②<br>N2SC2110U ② |
| 2         |                | START-STOP<br>(or Specify)         | 1/2<br>3/4                 | N2S1210U ②<br>N2S2210U ② | N2SC1210U ②<br>N2SC2210U ② |
| 3         |                | Specify                            | 1/2<br>3/4                 | N2S1310U ②<br>N2S2310U ② | N2SC1310U ②<br>N2SC2310U ② |
| 4         |                | Specify                            | 1/2<br>3/4                 | N2S1410U ②<br>N2S2410U ② | N2SC1410U ②<br>N2SC2410U ② |



Maintained pushbutton with pilot light control station

## Ordering Information - With Selector Switches\*

| Style                        | Position |   |   | Marking Unless Otherwise Specified | Enclosure with One Selector Switch |                          |                            |
|------------------------------|----------|---|---|------------------------------------|------------------------------------|--------------------------|----------------------------|
|                              | 1        | 2 | 3 |                                    | Hub Size                           | Dead End Cat. #          | Through Feed Cat. #        |
| Two-Position, Two-Circuit    | A1       |   |   | START-STOP<br>(or Specify)         | 1/2<br>3/4                         | N2S1121U ②<br>N2S2121U ② | N2SC1121U ②<br>N2SC2121U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
| Two-Position, Four-Circuit   | A1       |   |   | START-STOP<br>(or Specify)         | 1/2<br>3/4                         | N2S1122U ②<br>N2S2122U ② | N2SC1122U ②<br>N2SC2122U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
|                              | B1       |   |   |                                    |                                    |                          |                            |
| Three-Position, Two-Circuit  | A1       |   |   | Specify                            | 1/2<br>3/4                         | N2S1123U ②<br>N2S2123U ② | N2SC1123U ②<br>N2SC2123U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
| Three-Position, Four-Circuit | A1       |   |   | Specify                            | 1/2<br>3/4                         | N2S1124U ②<br>N2S2124U ② | N2SC1124U ②<br>N2SC2124U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
|                              | B1       |   |   |                                    |                                    |                          |                            |
| Three-Position, Four-Circuit | A1       |   |   | Specify                            | 1/2<br>3/4                         | N2S1125U ②<br>N2S2125U ② | N2SC1125U ②<br>N2SC2125U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
|                              | B1       |   |   |                                    |                                    |                          |                            |
|                              | B2       |   |   |                                    |                                    |                          |                            |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Marking

|               |         |                     |                     |
|---------------|---------|---------------------|---------------------|
| Push Buttons: | REVERSE | Selector Switches – | Selector Switches – |
| START         | OPEN    | Two-Position:       | Three-Position      |
| STOP          | CLOSE   | RUN-JOG             | RUN-OFF-JOG         |
| ON            | UP      | HAND-AUTO           | HAND-OFF-AUTO       |
| OFF           | DOWN    | FOR-REV             | FOR-OFF-REV         |
| RUN           | IN      | FAST-SLOW           | FAST-OFF-SLOW       |
| JOG           | OUT     | OPEN-CLOSE          | 1-OFF-2             |
| TRIP          | RAISE   | UP-DOWN             | OPEN-OFF-CLOSE      |
| RESET         | LOWER   | ON-OFF              | UP-OFF-DOWN         |
| TEST          |         | IN-OUT              |                     |
| LIGHT ON      |         | RAISE-LOWER         |                     |
| HAND          |         | START-STOP          |                     |
| AUTOMATIC     |         |                     |                     |
| EMERGENCY     |         |                     |                     |
| FORWARD       |         |                     |                     |

\*Replacement switch for selector switches is Cat. No. ESWP126.

N2SU/N2SCU  
Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

4C

Ordering Information - With Pilot Lights - Transformer Type

|           |         |       | Enclosure with Pilot Lights† |                     |                 |                     |
|-----------|---------|-------|------------------------------|---------------------|-----------------|---------------------|
| No. Units | Diagram | Volts | 1/2" Hubs                    |                     | 3/4" Hubs       |                     |
|           |         |       | Dead End Cat. #              | Through Feed Cat. # | Dead End Cat. # | Through Feed Cat. # |
| 1         |         | 120   | N2S1131U ①                   | N2SC1131U ①         | N2S2131U ①      | N2SC2131U ①         |
|           |         | 240   | N2S1132U ①                   | N2SC1132U ①         | N2S2132U ①      | N2SC2132U ①         |
| 2         |         | 120   | N2S1231U ①                   | N2SC1231U ①         | N2S2231U ①      | N2SC2231U ①         |
|           |         | 240   | N2S1232U ①                   | N2SC1232U ①         | N2S2232U ①      | N2SC2232U ①         |
| 3         |         | 120   | N2S1331U ①                   | N2SC1331U ①         | N2S2331U ①      | N2SC2331U ①         |
|           |         | 240   | N2S1332U ①                   | N2SC1332U ①         | N2S2332U ①      | N2SC2332U ①         |
| 4         |         | 120   | N2S1431U ①                   | N2SC1431U ①         | N2S2431U ①      | N2SC2431U ①         |
|           |         | 240   | N2S1432U ①                   | N2SC1432U ①         | N2S2432U ①      | N2SC2432U ①         |

① Specify lens color for each pilot light. As an example, N2S1231U with one red and one green would be ordered as N2S1231U-J1-J3

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

†Pilot lights are transformer type except those rated 120 volts.

4C

# 4C N2SU/N2SCU Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

## Ordering Information - Combination Control Stations†\*

| Pilot Lights* | Pushbuttons | Diagram | Marking Unless Otherwise Specified | Volts | Enclosure with Push Buttons and Pilot Lights† |                     |                 |                     |
|---------------|-------------|---------|------------------------------------|-------|-----------------------------------------------|---------------------|-----------------|---------------------|
|               |             |         |                                    |       | 1/2" Hubs                                     |                     | 3/4" Hubs       |                     |
|               |             |         |                                    |       | Dead End Cat. #                               | Through Feed Cat. # | Dead End Cat. # | Through Feed Cat. # |
|               |             |         |                                    |       |                                               |                     |                 |                     |
| 1             | 1           |         | Specify                            | 120   | N2S12411U ①②                                  | N2SC12411U ①②       | N2S22411U ①②    | N2SC22411U ①②       |
|               |             |         |                                    | 240   | N2S12412U ①②                                  | N2SC12412U ①②       | N2S22412U ①②    | N2SC22412U ①②       |
| 1             | 2           |         | START-STOP (or Specify)            | 120   | N2S13421U ①②                                  | N2SC13421U ①②       | N2S23421U ①     | N2SC23421U ①②       |
|               |             |         |                                    | 240   | N2S13422U ①②                                  | N2SC13422U ①②       | N2S23422U ①     | N2SC23422U ①②       |
| 2             | 1           |         | Specify                            | 120   | N2S13411U ①②                                  | N2SC13411U ①②       | N2S23411U ①②    | N2SC23411U ①②       |
|               |             |         |                                    | 240   | N2S13412U ①②                                  | N2SC13412U ①②       | N2S23412U ①②    | N2SC23412U ①②       |
| 2             | 2           |         | START-STOP (or Specify)            | 120   | N2S14421U ①②                                  | N2SC14421U ①②       | N2S24421U ①②    | N2SC24421U ①②       |
|               |             |         |                                    | 240   | N2S14422U ①②                                  | N2SC14422U ①②       | N2S24422U ①②    | N2SC24422U ①②       |

|                                                                                     |                                                                                                                                                                         | Selector Switches<br>Position No.                                                      |                                                                                     |                                                                                     |          | Enclosure With Pilot Light, Pushbuttons and Selector Switch |       |                                |                                  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|-------------------------------------------------------------|-------|--------------------------------|----------------------------------|
| Pilot Lights*                                                                       | Pushbuttons                                                                                                                                                             | 1                                                                                      | 2                                                                                   | 3                                                                                   | Markings | Hub Size in.                                                | Volts | Dead End Cat. #                | Through Feed Cat. #              |
| 1                                                                                   | 2                                                                                                                                                                       | Two-Position, Two-Circuit                                                              |                                                                                     |                                                                                     |          | ½<br>¾                                                      | 120   | N2S145211U ①②<br>N2S245211U ①② | N2SC145211U ①②<br>N2SC245211U ①② |
|  |   | A1  |  |                                                                                     | Specify  | ½<br>¾                                                      | 240   | N2S145212U ①②<br>N2S245212U ①② | N2SC145212U ①②<br>N2SC245212U ①② |
| 1                                                                                   | 2                                                                                                                                                                       | Three-Position, Two-Circuit                                                            |                                                                                     |                                                                                     |          | ½<br>¾                                                      | 120   | N2S145231U ①②<br>N2S245231U ①② | N2SC145231U ①②<br>N2SC245231U ①② |
|  |   | A1  |  |  | Specify  | ½<br>¾                                                      | 240   | N2S145232U ①②<br>N2S245232U ①② | N2SC145232U ①②<br>N2SC245232U ①② |

① Specify lens color for each pilot light. As an example, N2S1231U with one red and one green would be ordered as N2S1231U-J1-J3

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

| Marking       |                                   |                                     |
|---------------|-----------------------------------|-------------------------------------|
| Push Buttons: | Selector Switches – Two-Position: | Selector Switches – Three-Position: |
| START         | FORWARD                           | RUN-JOG                             |
| STOP          | REVERSE                           | HAND-AUTO                           |
| ON            | OPEN                              | FOR-OFF-REV                         |
| OFF           | CLOSE                             | FAST-SLOW                           |
| RUN           | UP                                | OPEN-CLOSE                          |
| JOG           | DOWN                              | UP-DOWN                             |
| TRIP          | IN                                | ON-OFF                              |
| RESET         | OUT                               | IN-OUT                              |
| TEST          | RAISE                             | RAISE-LOWER                         |
| LIGHT ON      | LOWER                             | START-STOP                          |
| HAND          |                                   |                                     |
| AUTOMATIC     |                                   |                                     |
| EMERGENCY     |                                   |                                     |

\*Replacement switch for selector switches is Cat. No. ESWP126.

†Pilot lights are transformer type except those rated 120 volts.

Crouse-Hinds  
by **E.T.N**

N2FA and N2FAC Fire Alarm Stations

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 7BCD (Div. 2), 12  
Raintight  
Wet Locations

4C

Factory Sealed, Corrosion-Resistant

Applications:

N2FA and N2FAC fire alarm stations are used:

- As break-glass fire alarm stations
- In conjunction with audible and/or visible signaling devices to alert personnel of a fire hazard
- In Class I, Division 2, Groups B, C, D hazardous areas where flammable vapors or gases may be present due to an accident or abnormal operation
- In damp, wet or corrosive locations
- Indoors or outdoors in Division 2 areas of petroleum refineries, chemical plants and other process industry facilities where similar hazards exist

Features:

- Factory sealed. External seals are not required.
- Enclosures are made of *Krydon*® fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat and sunlight.
- Highly visible molded-in red color for quick identification.
- Break-glass rod is attached to station with a chain for ready access during an emergency.
- Factory installed dead end (N2FA) or through feed (N2FAC) hubs – 1/2", 3/4" and 1" sizes.

Certifications and Compliances:

- NEC:  
Class I, Division 2, Groups B, C, D
- NEMA 3, 7BCD (Division 2), 12

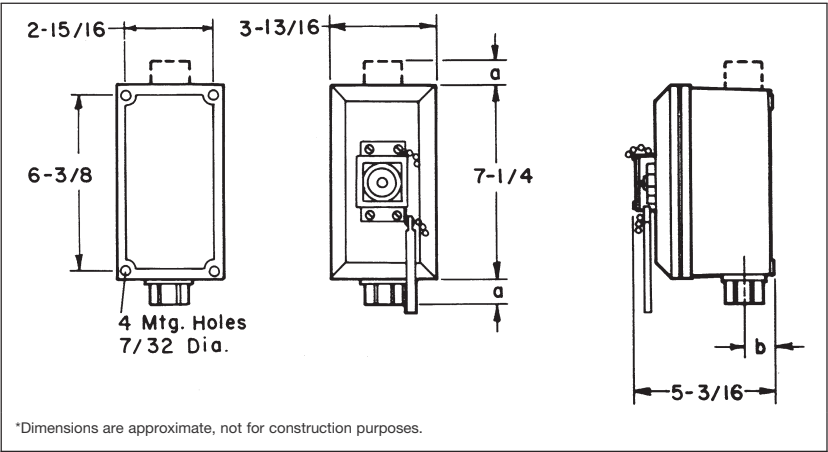


4C

Ordering Information

| Hub Size | Dead End Cat. # | Through Feed Cat. # | Replacement Glass Cat. # |
|----------|-----------------|---------------------|--------------------------|
| 1/2      | N2FA11          | N2FAC11             | DS K14                   |
| 3/4      | N2FA21          | N2FAC21             | DS K14                   |
| 1        | N2FA31          | N2FAC31             | DS K14                   |

Dimensions\*  
In Inches:



| 1/2" & 3/4" Hubs |        | 1" Hubs |        |
|------------------|--------|---------|--------|
| a                | b      | a       | b      |
| 1 1/8            | 1 1/16 | 1 1/4   | 1 5/16 |

## 4C GHG43 Series Control Stations

**Nonmetallic or 316L Stainless  
Steel Corrosion Resistant**

UL/cUL listed  
Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zones 1 and 2,  
(A) Ex de IIB + H<sub>2</sub> T6  
Cl. II, Div. 1, Groups E, F, G (cUL)

PTB ATEX CERTIFIED 3117  
Ex de IIC, T6,  
Zones 1 and 2  
Ex de IIC, T6 Zones 21 and 22  
IP 66, NEMA 4X

### Applications:

Control stations are used as a remote means of:

- Motor control
- Visual indication of equipment performance
- On-off control of circuits
- Circuit selection

Common applications include:

- Areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist

### Features:

- NEMA 4X, IP66 enclosure with formed-in-place gasket
- Available with all operators: indicator lights, potentiometers, control switches, pushbuttons, terminal blocks and meters
- Base-mounted contact blocks
- Easy change-out components snap in place on DIN rail
- Enclosure meets UL 94-VO. Also available in anti-static Ex e materials
- Inserts for mounting DIN rails
- Available with a maximum of 2 entries - top and bottom for conduit fittings or cable glands
- Suitable for universal mounting plates on pipes, conduit, wall or channels
- Mounting dimensions data molded on back
- Captive, corrosion-resistant cover screws
- Built-in mounting slots for wall installation
- Available in 316L stainless steel

### Certifications and Compliances:

- UL/cUL Listed
- Class I, Div. 2, Groups A, B, C, D
- Class II, Div. 1, Groups E, F, G (cUL)
- Class I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>, T6
- AEx de IIB + H<sub>2</sub>, T6
- Type 3, 4, 4X; IP66
- CENELEC-PTB 00 ATEX 3117
- Ex de IIC, T6, Zones 1 and 2, IP66

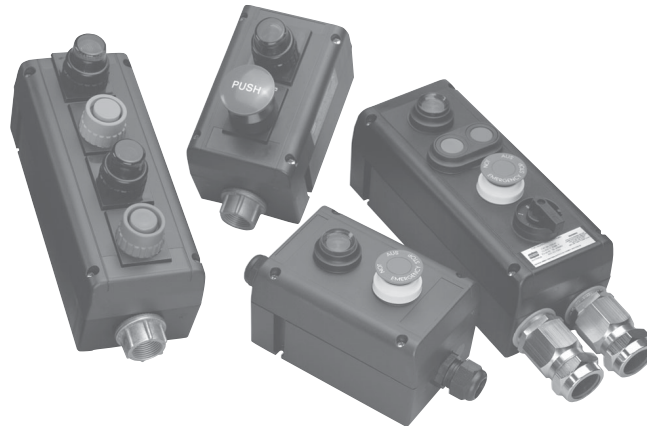
### Options:

#### Description

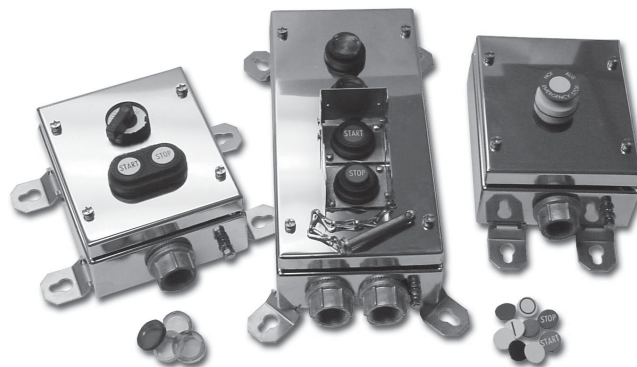
Eaton's Crouse-Hinds GHG43 Series control stations are now available with 316L stainless steel enclosures, making them ideal for corrosive and adverse locations - especially offshore platform applications

#### Suffix

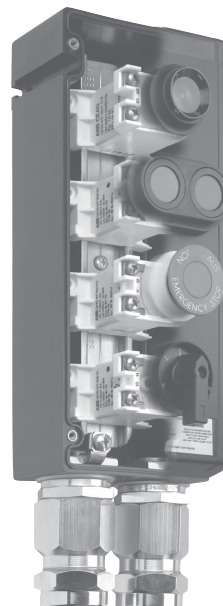
**S860**



**GHG43 Nonmetallic Control Stations**

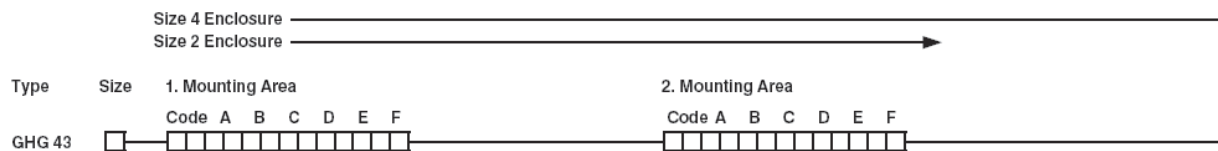


**GHG43 Stainless Steel Control Stations**

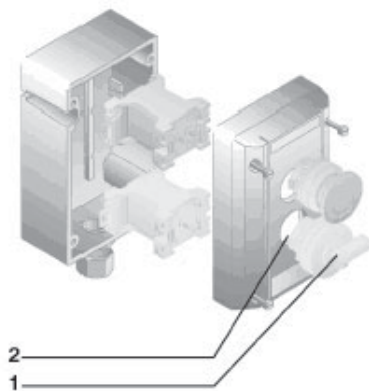


**Crouse-Hinds**  
by **Eaton**

## Nonmetallic or 316L Stainless Steel Corrosion Resistant



### GHG43 2 - Size 2 Enclosure



Mounting Area\*



Pushbutton DRT

Code A  B  C  D

Codes see page 559

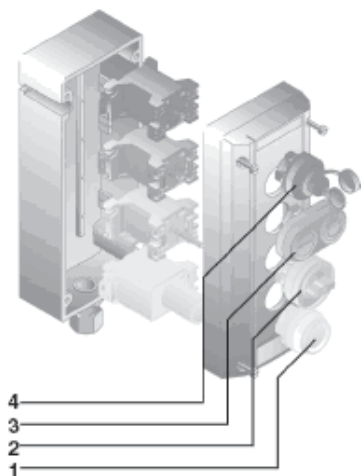


Double Pushbutton

Code A  B  C  D  E

Codes see page 559

### GHG43 4 - Size 4 Enclosure



Mounting Area\*



Key Operated Pushbutton

Code A  B  C

Codes see page 559



Mushroom-Head Pushbutton

Code A  B  C  D  E  F

Codes see page 560



Signal Lamp

Code A  B  C

Codes see page 560

‡For a GHG43 control station with 316L stainless steel enclosure, add suffix "S860" to end of catalog number.  
\*Unoccupied spaces must be filled in with KLM for correct positioning of devices.

### Nonmetallic or 316L Stainless Steel Corrosion Resistant

| 3. Mounting Area |   |   |   |   |   |   | 4. Mounting Area |   |   |   |   |   |   | Cable Entries |        |
|------------------|---|---|---|---|---|---|------------------|---|---|---|---|---|---|---------------|--------|
| Code             | A | B | C | D | E | F | Code             | A | B | C | D | E | F | Top           | Bottom |
|                  |   |   |   |   |   |   |                  |   |   |   |   |   |   |               |        |



Potentiometer

Code A    Code B

Codes see page 561



Measuring Instrument

Code A    Code B  Code C

Codes see page 562  
Requires 2 spaces

Switch

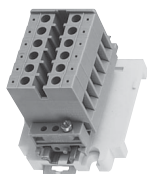
Code A    Code B  Code C  Code D

Codes see pages 563–564



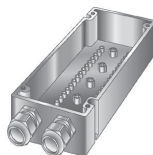
Control Switch Ex 23 10A

Code A     Code B  Code C  Code D  Code E

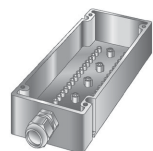
Codes see pages 563–564  
Requires 2 spacesTerminals and cover  
blanking plug

Code A    Code B

Code see page 561



Two entries



One entry

### Cable Entries

#### NPT

No entries

 2 x 1/2" Myers Hub,  
STGK1 Zinc Gland  
plate 2 x 3/4" Myers Hub,  
STGK2 Zinc Gland  
plate  
(Stainless Steel  
Control Stations only) 2 x 1/2" Myers Hub,  
SSTGK1 Stainless  
steel  
Gland plate 2 x 3/4" Myers Hub,  
SSTGK2 Stainless  
steel  
Gland plate  
(Stainless Steel  
Control Stations only) 1 x 1/4" Myers Hub,  
STGK2, Zone 1  
Gland plate 1 x 1/2" Myers Hub,  
STGK1, Zone 1  
Gland plate 1 x 1/2" Myers Hub,  
SSTGK1 Stainless st.  
Gland plate 1 x 3/4" Myers Hub,  
SSTGK2 Stainless st.  
Gland plate

#### Metric

No entries

 2 x M25 Plastic  
Cable gland M25  
Blanking plug 2 x M20  
Threaded entries  
Gland plate 2 x M25  
Threaded entries  
Gland plate 1 x M32 Plastic  
Cable gland 1 x M25  
Threaded Entry,  
Blanking plug and  
Gland plate 2 x M25  
Threaded Entry,  
1 blanking plug and  
Gland plate 1 x M20  
Threaded entry  
Blanking plug and  
Gland plate 1 x 3/4"  
Myers Hub  
SSTGK2 stainless  
steel,  
Gland plate

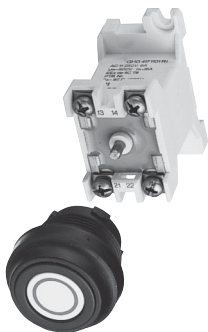
†For a GHG43 control station with 316L stainless steel enclosure, add suffix "S860" to end of catalog number.  
\*Unoccupied spaces must be filled in with KLM for correct positioning of devices.



## Nonmetallic or 316L Stainless Steel Corrosion Resistant

### Pushbuttons:

- Used for logic controls in hazardous areas
- Single or double units
- Used with all operators
- Base mounting

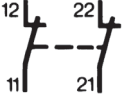
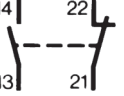


| Pushbutton                     |
|--------------------------------|
| Type of Protection             |
| Certificate of Conformity      |
| Approvals                      |
| Rated Voltage                  |
| Rated Current                  |
| Terminal Wiring                |
| Mechanical and Electrical Life |

Ex de IIC T6  
PTB No. Ex-87.B.1007U  
PTB, UL, cUL  
Up to 400V  
NEC/CEC 10A IEC 16 A  
2 x 2.5mm<sup>2</sup> / 14AWG  
>10<sup>5</sup> Operations

See page 564 for explanation of contact symbols.

### Pushbutton DRT

|                      |                                                                                   |                                                                                     |                                                                                     |    |      |                                            |                         |  |                                            |  |  |                                   |  |
|----------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|--------------------------------------------|-------------------------|--|--------------------------------------------|--|--|-----------------------------------|--|
|                      | <table><tr><td>D</td><td>R</td><td>T</td><td>O</td></tr></table>                  | D                                                                                   | R                                                                                   | T  | O    | <table><tr><td></td><td></td></tr></table> |                         |  | <table><tr><td></td><td></td></tr></table> |  |  | <table><tr><td></td></tr></table> |  |
| D                    | R                                                                                 | T                                                                                   | O                                                                                   |    |      |                                            |                         |  |                                            |  |  |                                   |  |
|                      |                                                                                   |                                                                                     |                                                                                     |    |      |                                            |                         |  |                                            |  |  |                                   |  |
|                      |                                                                                   |                                                                                     |                                                                                     |    |      |                                            |                         |  |                                            |  |  |                                   |  |
|                      |                                                                                   |                                                                                     |                                                                                     |    |      |                                            |                         |  |                                            |  |  |                                   |  |
| Code                 | A                                                                                 | B                                                                                   | C                                                                                   | D  |      |                                            |                         |  |                                            |  |  |                                   |  |
| Contact System       |  |  |  |    |      |                                            |                         |  |                                            |  |  |                                   |  |
| Code B               | 13                                                                                | 14                                                                                  | 15                                                                                  |    |      |                                            |                         |  |                                            |  |  |                                   |  |
| Inscription          | ALL *                                                                             | 0                                                                                   | I                                                                                   | II | Stop | Start                                      | Special-Text On Order † |  |                                            |  |  |                                   |  |
| Code C               | 01                                                                                | 02                                                                                  | 03                                                                                  | 04 | 06   | 07                                         | 99                      |  |                                            |  |  |                                   |  |
| Lockout see page 565 |                                                                                   |                                                                                     |                                                                                     |    |      |                                            |                         |  |                                            |  |  |                                   |  |

Lockout see page 565

Code D (leave blank if no lockout required)

### Double Pushbutton DDTO

|                      |                                                         |                                                         |                                                         |                         |             |       |                         |
|----------------------|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-------------------------|-------------|-------|-------------------------|
|                      | <div>D</div> <div>D</div> <div>T</div> <div>O</div>     | <div></div> <div></div>                                 | <div></div> <div></div>                                 | <div></div> <div></div> | <div></div> |       |                         |
| Code                 | A                                                       | B                                                       | C                                                       | D                       | E           |       |                         |
| Contact System       | <div>12</div> <div>22</div> <div>11</div> <div>21</div> | <div>14</div> <div>24</div> <div>13</div> <div>23</div> | <div>14</div> <div>22</div> <div>13</div> <div>21</div> |                         |             |       |                         |
| Code B               | 43                                                      | 44                                                      | 45                                                      |                         |             |       |                         |
| Inscription          | ALL *                                                   | 0                                                       | I                                                       | II                      | Stop        | Start | Special-Text on Order † |
| Code C, D Left/Right | 01                                                      | 02                                                      | 03                                                      | 04                      | 06          | 07    | 99                      |
| Lockout see page 565 |                                                         |                                                         |                                                         |                         |             |       |                         |

Lockout see page 565

Code E (leave blank if no lockout required)

### Key-Operated Pushbutton SLT

|                |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
|----------------|------------------------------------------------------------------|-----|-----|-----|-----|--------------------------------------------|-----|--|-----------------------------------|--|
|                | <table><tr><td>S</td><td>L</td><td>T</td><td>O</td></tr></table> | S   | L   | T   | O   | <table><tr><td></td><td></td></tr></table> |     |  | <table><tr><td></td></tr></table> |  |
| S              | L                                                                | T   | O   |     |     |                                            |     |  |                                   |  |
|                |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
|                |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
| Code           | A                                                                | B   | C   |     |     |                                            |     |  |                                   |  |
| Contact System |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
| Code B         | 23                                                               | 24  | 25  |     |     |                                            |     |  |                                   |  |
| Pushbutton     | Key                                                              |     |     |     |     |                                            |     |  |                                   |  |
| Not Depressed  | Lockable                                                         | Yes | Yes | Yes | No  | No                                         | Yes |  |                                   |  |
|                | Key Removable                                                    | Yes | Yes | No  | No  | Yes                                        | Yes |  |                                   |  |
| Depressed      | Lockable                                                         | Yes | No  | Yes | Yes | Auto                                       | Yes |  |                                   |  |
|                | Key Removable                                                    | No  | No  | Yes | Yes | Yes                                        | Yes |  |                                   |  |
| Code C         |                                                                  | 1   | 2   | 3   | 4   | 5                                          | 6   |  |                                   |  |

\* 01 - Includes the following discs - Start, stop, I, O, and red, green, yellow, white and black blank discs.

† For Marking Guide for Pushbuttons see page 565.

**Crouse-Hinds**

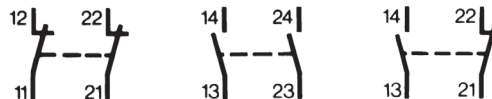
by **Eaton**

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

## Mushroom-Head Pushbutton SGT



## Contact System



|                                             |               |            |                |
|---------------------------------------------|---------------|------------|----------------|
| Code B                                      | 53            | 54         | 55             |
| Color of Pushbutton                         | Red           | Yellow     | Black Actuator |
| Code C                                      | 1             | 2          | 3              |
| Function                                    | Spring Return | Maintained | Key Release    |
| Code D                                      | 1             | 2          | 3              |
| Inscription                                 | Stop          | Start      | Black Actuator |
| Code E                                      | 06            | 07         | 11             |
| Lockout<br>see page 565                     |               |            |                |
| Code F (leave blank if no lockout required) |               |            |                |

## Signal Lamp

- Used for positive feedback indication
- High intensity with special reflector and optical lens
- Accommodates most input voltages
- Base mounting



|                           |                                          |
|---------------------------|------------------------------------------|
|                           | Lamp                                     |
| Type of Protection        | Ex de IIC T6                             |
| Certificate of Conformity | PTB No. Ex-88.B.2106U                    |
| Approvals                 | PTB, UL, cUL                             |
| Lamp Life                 | >100,000 Hours (11.5 Years)              |
| Rated Voltages            | Up to 240VAC, 50 / 60 Hz<br>Up to 110VDC |
| Rated Current             | Max. 15 mA                               |
| Power Consumption         | <1.2W                                    |
| Terminal Wiring           | 2 x 2.5mm <sup>2</sup> / 14AWG           |
| Colors                    | Red, Green, Yellow, Clear & Blue         |

## Signal Lamp SIL

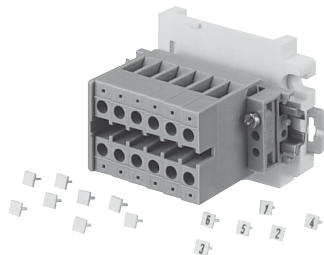


|                    |              |        |     |                                 |       |      |
|--------------------|--------------|--------|-----|---------------------------------|-------|------|
| Colored Lens Cover | White        | Yellow | Red | 1 pkg white, yellow, red, green | Green | Blue |
| Code B             | 1            | 2      | 3   | 4                               | 5     | 6    |
| Voltage            | 20-250VAC/DC |        |     | 10-33VAC/DC                     |       |      |
| Code C             | 01           |        |     | 31                              |       |      |

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

Terminal Blocks

- Terminal block for easy field connections
- Base mounting



| Terminal Blocks           |                       |
|---------------------------|-----------------------|
| Type of Protection        | Ex e II               |
| Certificate of Conformity | PTB No. Ex-88.B.3112U |
| Rated Voltages            | Up to 400V            |
| Rated Current             | 23A                   |
| Conductor Size            | 4mm² / 12AWG          |

Terminals and Cover Plugs  
KLM

|      |   |   |   |   |  |
|------|---|---|---|---|--|
|      | K | L | M |   |  |
| Code | A |   |   | B |  |

|        | 6 Terminals 2 x 4 mm² | Undrilled Cover (No Terminals) |
|--------|-----------------------|--------------------------------|
| Code B | 61                    | 00                             |

Potentiometers

- Used to adjust resistance to vary motor speed or light levels
- Scale 0 to 100%
- Base mounting



| Potentiometers            |                       |
|---------------------------|-----------------------|
| Type of Protection        | Ex de IIC T6          |
| Certificate of Conformity | PTB No. Ex-87.B.1007U |
| Approvals                 | PTB, UL, cUL          |
| Rated Voltages            | >250V                 |
| Power Consumption         | 1.0W                  |
| Resistance                | 100–10,000W           |
| Angle of Rotation         | 270°                  |
| Scale                     | 0–100%                |
| Connection Terminals      | 2 x 2.5mm² / 14AWG    |

Potentiometer POT

|      |   |   |   |   |
|------|---|---|---|---|
|      | P | O | T |   |
| Code | A |   |   | B |

| Power Consumption | 1W    |       |       |        |
|-------------------|-------|-------|-------|--------|
| Resistance W      | 1,000 | 2,200 | 4,700 | 10,000 |
| Code B            | 4     | 7     | 5     | 6      |

**Nonmetallic or 316L Stainless Steel  
Corrosion Resistant****Ammeters**

- Used to measure motor current draw for efficiencies and maintenance
- Slide in scales to accommodate any amperage range
- Red indicator for quick visual indication to compare set points and actual values

**Ammeters**

|                                  |                                  |
|----------------------------------|----------------------------------|
| <b>Type of Protection</b>        | Ex e II T6                       |
| <b>Certificate of Conformity</b> | PTB No. Ex-87.B.2016U            |
| <b>Approvals</b>                 | PTB, UL, cUL                     |
| <b>Movement</b>                  | Moving iron (core)               |
| <b>Accuracy</b>                  | 2.5% of range (class 2.5)        |
| <b>Measuring Range</b>           | 0-16A direct, C.T. n/1 A         |
| <b>Operating Position</b>        | Vertical                         |
| <b>Scale</b>                     | Interchangeable for C.T. n/1 A   |
| <b>Zero Adjustment</b>           | At instrument                    |
| <b>Terminal Wiring</b>           | 2 x 2.5 mm <sup>2</sup> / 14 AWG |
| <b>Rated Current Marking</b>     | Red indicator                    |

**Ammeter Measuring  
Instrument AM 72\***

|   |   |   |  |  |  |
|---|---|---|--|--|--|
| M | 7 | 2 |  |  |  |
|---|---|---|--|--|--|

Code      A                  B                  C

|                 |               |              |                 |                |
|-----------------|---------------|--------------|-----------------|----------------|
| <b>Movement</b> | <b>Direct</b> | <b>n/1 A</b> | <b>0 - 2 mA</b> | <b>4-20 mA</b> |
| <b>Code B</b>   | 1             | 2            | 3               | 6              |

Movements 0-20 mA and 4-20 mA are only available with 0 - 100 / 120% scale

| <b>Direct Measurement</b> |               | <b>Interchangeable Scale for C.T. n/1A</b> |               |               |               |               |              |
|---------------------------|---------------|--------------------------------------------|---------------|---------------|---------------|---------------|--------------|
| <b>Code C</b>             | <b>Scale</b>  | <b>Code C</b>                              | <b>Scale</b>  | <b>Code C</b> | <b>Scale</b>  | <b>Code C</b> | <b>Scale</b> |
| 02                        | 0 - 1/1.5A    | 02                                         | 0 - 1/1.5A    | 09            | 0 - 30/45A    | 16            | 0 - 200/300A |
| 03                        | 0 - 2.5/3.75A | 03                                         | 0 - 2.5/3.75A | 10            | 0 - 40/60A    | 17            | 0 - 250/375A |
| 04                        | 0 - 5/7.5A    | 04                                         | 0 - 5/7.5A    | 11            | 0 - 50/75A    | 18            | 0 - 300/450A |
| 05                        | 0 - 10/15A    | 05                                         | 0 - 10/15A    | 12            | 0 - 60/90A    | 19            | 0 - 400/600A |
| 07                        | 0 - 16/24A    | 06                                         | 0 - 15/22.5A  | 13            | 0 - 75/112.5A | 20            | 0 - 500/750A |
|                           |               | 08                                         | 0 - 20/30A    | 14            | 0 - 100/150A  | 21            | 0 - 600/900A |
|                           |               |                                            |               | 15            | 0 - 150/225A  | 22            | 0 - 100/150A |

\* Requires 2 spaces.

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

Rotary Control Switches

- Used for selectable operations (i.e. Hand-Off-Auto)
- 2 independent contacts
- Available in any contact configuration
- Spring return or maintained position
- Available with lockout positions



|                           | SCT                                                                           | Ex 23                                                                                                        |
|---------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Type of Protection        | Ex de IIC T6                                                                  | Ex de IIC T6                                                                                                 |
| Certificate of Conformity | Ex.87.B.1007U                                                                 | PTB no. Ex-88.B.1047U                                                                                        |
| Approvals                 | PTB, UL, cUL                                                                  | PTB, UL, cUL                                                                                                 |
| Rated Voltage             | 400 V                                                                         | Up to 500 V                                                                                                  |
| Rated Current             | NEC 10 A<br>IEC 16 A                                                          | NEC 10 A<br>IEC 16 A                                                                                         |
| Terminal Wiring           | 2 x 2.5mm <sup>2</sup> / 14 AWG                                               | 2 x 2.5mm <sup>2</sup> / 14 AWG                                                                              |
| Mechanical Life           | >10 <sup>5</sup> Operations                                                   | >10 <sup>5</sup> Operations                                                                                  |
| Electrical Life           | >10 <sup>5</sup> Operations                                                   | >10 <sup>5</sup> Operations                                                                                  |
| Switching Capacity        | AC II: 20V/6A<br>400V/4A<br>DC II: 24V/6A<br>60V/0.8A<br>110V/.5A<br>220V/.2A | AC I: 500G/10A<br>AC II: 230V/6A<br>500V/6A<br>DC II: 24V/6A<br>48V/4A<br>60V/0.8A<br>110V/0.5A<br>220V/0.4A |

Rotary Control Switch SCT

Code

S

C

T

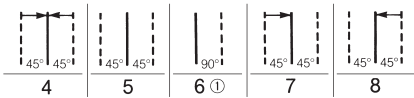
A

B

C

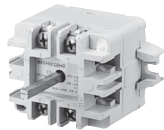
D

Switch Mechanism



| Code B |             |       |        |                                     |        |       |
|--------|-------------|-------|--------|-------------------------------------|--------|-------|
| Code C | Inscription |       | Code C | Inscription                         |        |       |
| 01     | 0           | I     | 07     | I                                   | 0      | II    |
| 03     | STOP        | START | 13     | LOCAL                               | REMOTE | AUTO  |
| 04     | HAND        | AUTO  | 14     | STOP                                | 0      | START |
| 06     | REMOTE      | LOCAL | 15     | HAND                                | 0      | AUTO  |
| 29     | OFF         | ON    | 99     | Special – text to be given on order |        |       |

Same as SCT above except up to 4 independent contacts



Contact System



|        |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|
| Code D | 1 | 2 | 3 | 4 | 5 | 6 |
|--------|---|---|---|---|---|---|

Rotary Control Switch Ex 23\*

Code

E

x

2

3

A

B

C

D

E

| Code B | Inscription                         |
|--------|-------------------------------------|
| 01     | 0                                   |
| 03     | STOP                                |
| 04     | HAND                                |
| 06     | remote                              |
| 07     | I                                   |
| 13     | LOCAL                               |
| 14     | STOP                                |
| 23     | OFF                                 |
| 24     | HAND                                |
| 27     | START                               |
| 29     | OFF                                 |
| 32     | ON                                  |
| 99     | Special – text to be given on order |
|        | I                                   |
|        | START                               |
|        | AUTO                                |
|        | local                               |
|        | 0                                   |
|        | REMOTE                              |
|        | 0                                   |
|        | 0                                   |
|        | OFF                                 |
|        | STOP                                |
|        | ON                                  |
|        | OFF                                 |
|        | AUTO                                |
|        | START                               |
|        | ON                                  |
|        | AUTO                                |

\* Requires 2 spaces in cover.

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

4C

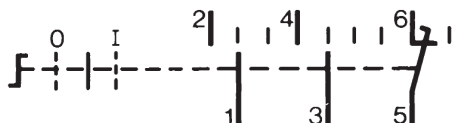
| Code C                           | Contact System | Type                    | Code C | Contact System | Type                              |
|----------------------------------|----------------|-------------------------|--------|----------------|-----------------------------------|
| 00                               |                | 2 Position              | 09     |                | 3 Position                        |
| 01                               |                | 2 Position              | 10     |                | 3 Position                        |
| 02                               |                | 2 Position              | 12     |                | 3 Position                        |
| 03                               |                | Single Pole Changeover  | 13     |                | 2 Position                        |
| 05                               |                | HOA                     | 14     |                | 2 Position                        |
| 07                               |                | 3 Position Single Level | 15     |                | 3 Position Double Pole Changeover |
| <b>Switched Mechanism Code D</b> |                |                         |        |                |                                   |

**Padlocking Facility**  
**Code E**


## Contact Configurations

|                                           |  |  |                                     |
|-------------------------------------------|--|--|-------------------------------------|
| Normally Closed                           |  |  | Normally Open                       |
| Normally Closed Extended Over 2 Positions |  |  | Normally Open Early Make/Late Break |
| Change-Over Break Before Make             |  |  | Change-Over Make Before Break       |

## Example of Switch Type 10



This example is the switch type 10 Stop-Run-Stop. The switch has 3 positions – the normal position is center and can be switched left or right. An arrow ( $\leftrightarrow$ ) indicates spring return. (See codes for switch mechanism). Contacts 1-2 only close in the Stop position. Contacts 3-4 close only in the Start position. Contacts 5-6 are normally closed and remain closed when switched to the Start position and open when switched to the Stop position.

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

Lockouts for DRTO Pushbuttons



**X**  
**Code D**  
Shroud Cover For  
Pushbutton  
Y-Lockout with bolt and chain



**Z**  
**Code D**  
Padlocking Fire Alarm  
Cover For Pushbutton

Lockouts for DDTO Double Pushbuttons



**X**  
**Code ED**  
Padlocking Cover For  
Double Pushbutton  
Without Hole



**Z**  
**Code E**  
Padlocking Cover For  
Double Pushbutton  
With Hole

Lockouts for SGT Mushroom-Head Pushbuttons



**X**  
**Code F**  
Padlocking Cover For  
Emergency Stop Pushbutton



**Z**  
**Code F**  
Padlocking Cover For  
Emergency Stop Pushbutton  
With Bolt & Chain  
Not permitted in IEC hazardous  
locations.

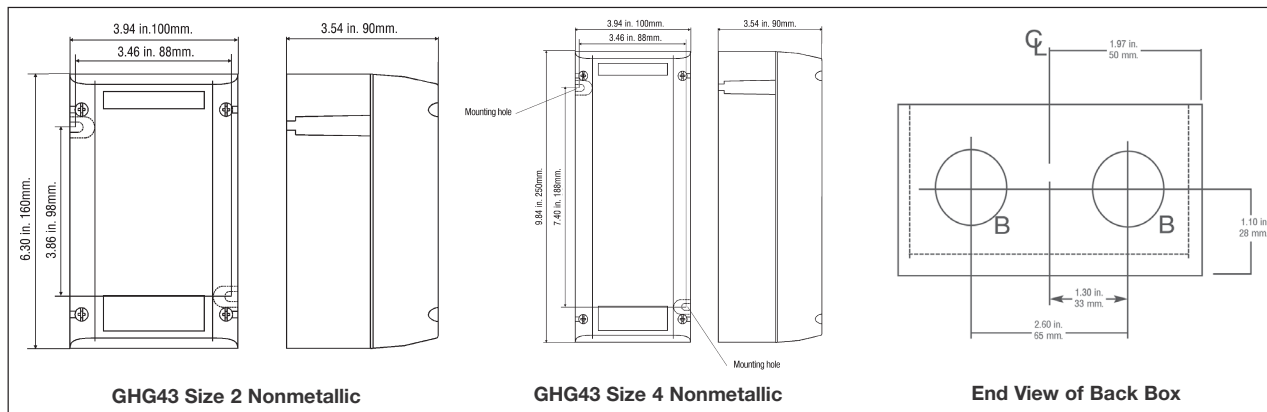
Marking Guide For Pushbuttons  
Special Text

| Marking Required | Standard Abbreviation | Actual Marking on Disc |
|------------------|-----------------------|------------------------|
| Acknowledge      | AK                    | ACK                    |
| Alarm            | AM                    | ALARM                  |
| Automatic        | AU                    | AUTO                   |
| Close            | CL                    | CLOSE                  |
| Down             | DN                    | DOWN                   |
| Fast             | FS                    | FAST                   |
| Forward          | FW                    | FWD                    |
| Hand             | HN                    | HAND                   |
| High             | HI                    | HIGH                   |
| In               | IN                    | IN                     |
| Jog              | JG                    | JOG                    |
| Local            | LC                    | LOCAL                  |
| Lower            | LO                    | LOWER                  |
| Maintain         | MT                    | MAINT                  |
| Manual           | MN                    | MANUAL                 |
| Normal           | NR                    | NORMAL                 |
| Off              | OF                    | OFF                    |
| On               | ON                    | ON                     |
| Open             | OP                    | OPEN                   |
| Out              | OT                    | OUT                    |
| Raise            | RA                    | RAISE                  |
| Remote           | RM                    | REMOTE                 |
| Reset            | RS                    | RESET                  |
| Reverse          | RV                    | REV                    |
| Run              | RN                    | RUN                    |
| Slow             | SL                    | SLOW                   |
| Test             | TT                    | TEST                   |
| Trip             | TP                    | TRIP                   |
| Up               | UP                    | UP                     |

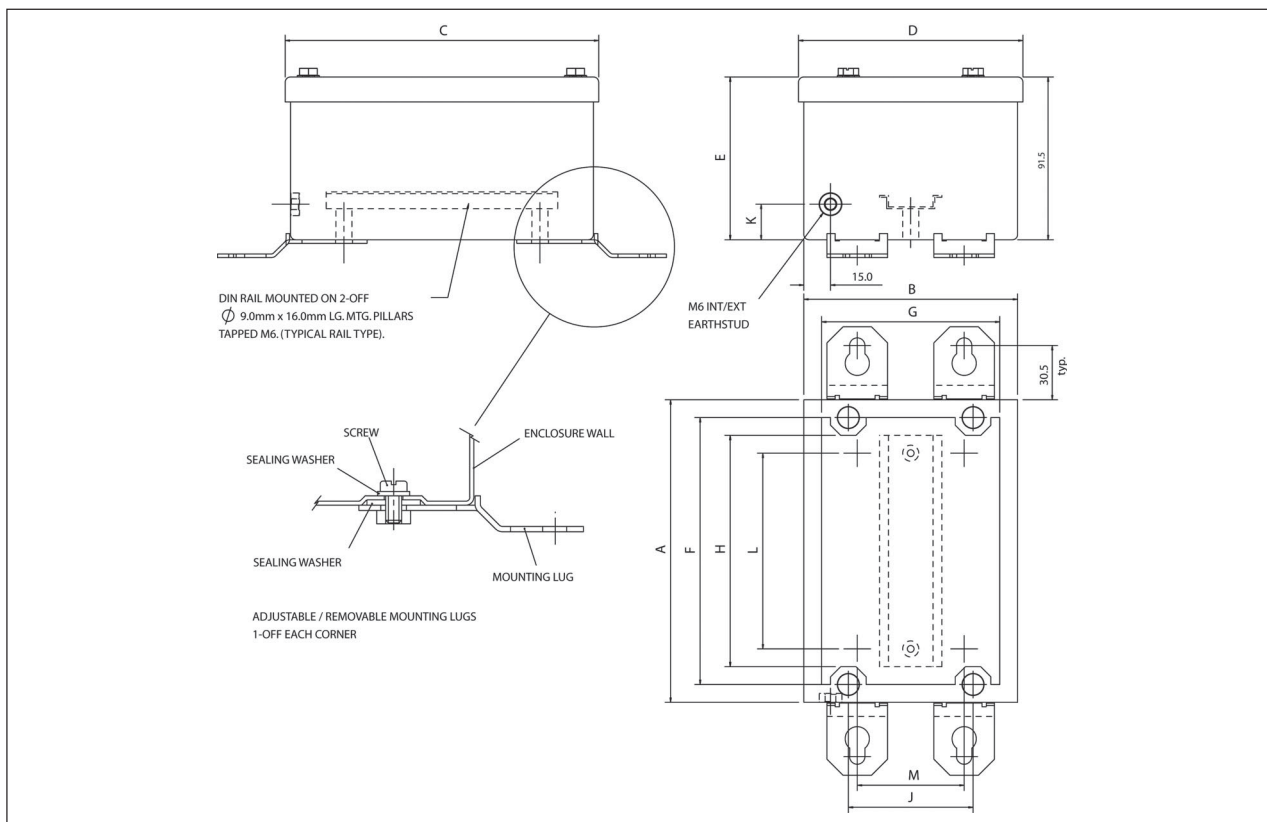


**Nonmetallic or 316L Stainless Steel  
Corrosion Resistant**

### GHG43 Nonmetallic Control Stations



### GHG43 Stainless Steel Control Stations



#### Box Type

#### Dimension (inches)

|                            | A     | B    | C     | D    | E    | F    | G    | H    | J    | K    | L    | M    |
|----------------------------|-------|------|-------|------|------|------|------|------|------|------|------|------|
| 1 Operator Control Station | 4.72  | 4.72 | 4.96  | 4.96 | 3.60 | 3.94 | 3.94 | 3.15 | 2.76 | 0.79 | 2.36 | 2.36 |
| 2 Operator Control Station | 6.69  | 4.72 | 6.93  | 4.96 | 3.60 | 5.90 | 3.94 | 5.12 | 2.76 | 0.79 | 4.33 | 2.36 |
| 3 Operator Control Station | 8.66  | 4.72 | 8.90  | 4.96 | 3.60 | 7.87 | 3.94 | 7.09 | 2.76 | 0.79 | 6.30 | 2.36 |
| 4 Operator Control Station | 10.63 | 4.72 | 10.87 | 4.96 | 3.60 | 9.84 | 3.94 | 9.06 | 2.76 | 0.79 | 8.27 | 2.36 |

# OAC Series Pushbutton Stations and Heavy Duty Selector Switches

**600 VAC Standard  
Factory Sealed†**

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7ABCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**4C**

## Applications:

OAC Units are used:

- In areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- In areas which are hazardous due to the presence of acetylene and hydrogen, or gases or vapors of equivalent hazard such as manufactured gas
- In conjunction with magnetic starters or contactors for remote control of motors

## Features:

- Water-shedding construction with female threaded bottom opening and male threaded cover
- Threaded cover is deep dome type, which surrounds the enclosed device
- All enclosures are suitable for hazardous area use
- Pushbutton stations have a guarded rocker type operating handle at the front arranged for padlocking to prevent unauthorized operation
- Selector switches have a lever type operating handle at the top
- Provided with vertical through feed conduit hubs of sizes indicated in the listings
- Units are factory sealed for Cl. I, Div. 1 and 2, Groups B, C, D
- Standard lockout on selector switches. Locks two or three-position switch handle in any position.

## Standard Materials:

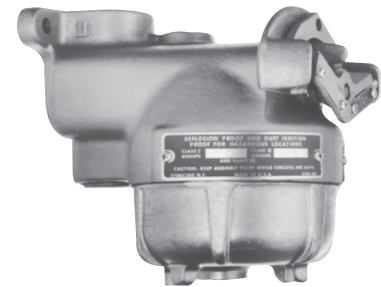
- Bodies – *Feraloy*® iron alloy
- Covers and operating handle – copper-free aluminum
- Operating shafts – stainless steel

## Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

## Certifications and Complies:

- NEC/CEC  
Class I, Division 1 & 2, Groups A, B, C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA/EEMAC: 3, 4, 7ABCD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30



## Electrical Rating Ranges:

- Pushbutton stations, and selector switches - Air Break – heavy duty 600VAC maximum

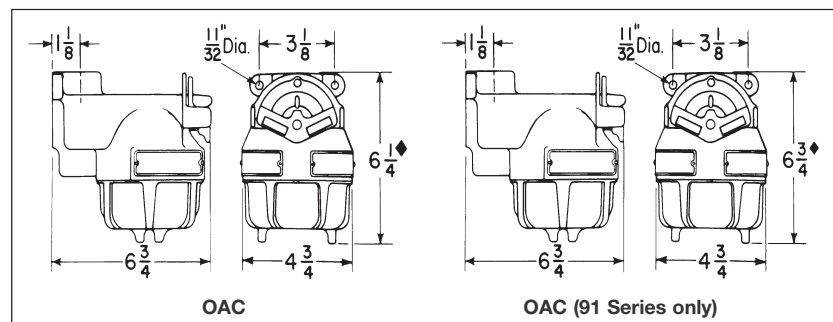
## Options:

The following special options are available from factory by adding suffix to Cat. #:

### Description

| Description                                                             | Suffix  |
|-------------------------------------------------------------------------|---------|
| Back boss drilled and tapped for 3/4" and 1" sizes.....                 | Specify |
| Three-position selector switches with modified operation:               |         |
| Momentary contact clockwise operation, spring return to center,         |         |
| maintained contact counter-clockwise operation.....                     | S634    |
| Momentary contact counter-clockwise operation, spring return to center, |         |
| maintained contact clockwise operation.....                             | S635    |

## Dimensions In Inches\*:



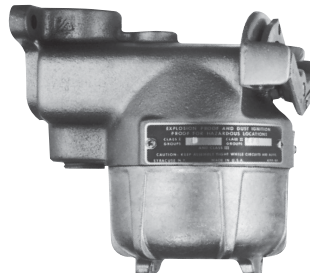
†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D.

\*Dimensions are approximate, not for construction purposes. For cover removal, add 2 1/2" to dimension.

# 4C OAC Series Pushbutton Stations and Heavy Duty Selector Switches

600 VAC Standard  
Factory Sealed†

Cl. I, Div. 1 & 2, Groups A, B, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 4, 7ABCD, 9EFG, 12 Watertight



## Ordering Information - Pushbutton Stations

Normal Pos. 1 Circuit Universal 2 Circuits Universal 2 Circuits Universal 2 Circuits\*

Oper. Handles

Single Double Single Operating Both Buttons Double

Replacement Pushbuttons Diagram

ED21 ED22 ED22 ED22\* A B

| Hub Size | Cat. #    | Cat. #    | Cat. #    | Cat. #    |
|----------|-----------|-----------|-----------|-----------|
| 3/4      | OAC2101 ① | OAC2133 ① | OAC2139 ① | OAC2103 ① |
| 1        | OAC3101 ① | OAC3133 ① | OAC3139 ① | OAC3103 ① |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D

\*Two universal contact blocks, must be wired as two circuits, one normally open and one normally closed.

With momentary left handle and maintained right handle. For momentary "START", maintained "STOP" and similar applications.

Normal Pos. 2 Circuit Universal

Diagram



Enclosure with Pushbuttons

| Hub Size | Cat. #    |
|----------|-----------|
| 3/4      | OAC2291 ① |
| 1        | OAC3291 ① |

OAC Series Pushbutton Stations and Heavy Duty Selector Switches

600 VAC Standard  
Factory Sealed†

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7ABCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

4C

Ordering Information - Selector Switches

| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks* | Enclosure with Selector Switch |           |
|--------------------------------|------------|------------|------------|-----------------------------|--------------------------------|-----------|
|                                |            |            |            |                             | Hub Size                       | Cat. #    |
| Two-Position, Two-Circuit      | A1         |            |            | ED21                        | 3/4                            | OAC2471 ① |
|                                | A2         |            |            |                             | 1                              | OAC3471 ① |
| Two-Position, Four-Circuit     | A1         |            |            | ED22                        | 3/4                            | OAC2472 ① |
|                                | A2         |            |            |                             | 1                              | OAC3472 ① |
|                                | B1         |            |            |                             |                                |           |
|                                | B2         |            |            |                             |                                |           |
| Three-Position, Two-Circuit ‡  | A1         |            |            | ED21                        | 3/4                            | OAC2473 ① |
|                                | A2         |            |            |                             | 1                              | OAC3473 ① |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED22                        | 3/4                            | OAC2474 ① |
|                                | A2         |            |            |                             | 1                              | OAC3474 ① |
|                                | B1         |            |            |                             |                                |           |
|                                | B2         |            |            |                             |                                |           |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED22                        | 3/4                            | OAC2475 ① |
|                                | A2         |            |            |                             | 1                              | OAC3475 ① |
|                                | B1         |            |            |                             |                                |           |
|                                | B2         |            |            |                             |                                |           |



OAC Selector Switches are furnished with pushbutton contact blocks, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below.

4C

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard catalog markings below:

Two-Position

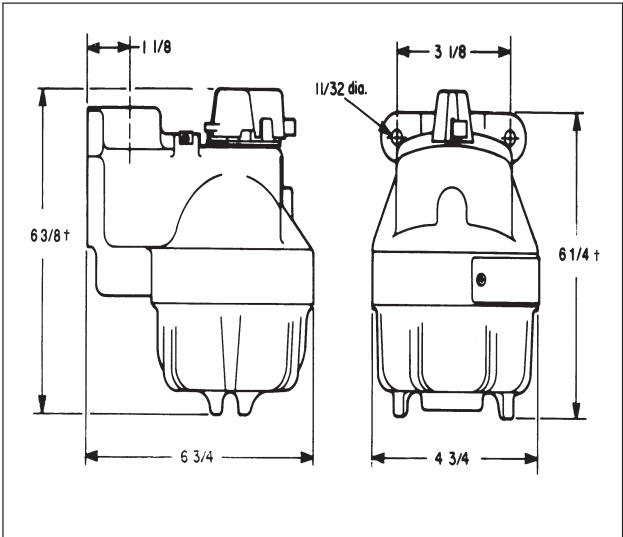
|                  |             |             |
|------------------|-------------|-------------|
| RUN, JOG         | FAST, SLOW  | IN-OUT      |
| HAND, AUTOMATIC  | OPEN, CLOSE | RAISE-LOWER |
| FORWARD, REVERSE | UP, DOWN    | START-STOP  |
|                  | ON, OFF     |             |

Three-Position

|                       |                  |
|-----------------------|------------------|
| RUN, OFF, JOG         | 1, OFF, 2        |
| HAND, OFF, AUTOMATIC  | OPEN, OFF, CLOSE |
| FORWARD, OFF, REVERSE | UP, OFF, DOWN    |
| FAST, OFF, SLOW       |                  |

Dimensions\*

In Inches:



†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D

‡ Suffixes S634 or S635 may be used on these catalog numbers. See page 567 of explanation of options.

\*Dimensions are approximate. Not for construction purposes. For cover removal, add 2 1/2" to dimension.

# 4C Control Station Covers

## Hinged and Open Front



Open Front Cover



Hinged Cover

### Applications:

Added environmental protection for Eaton's Crouse-Hinds control stations is now available from a patented "slip on" series of covers. Easy to install, these enclosures are available in hinged and open front styles, and are ideal for corrosive and adverse areas where product endurance is essential.

#### Secured Access Hinged Cover

- High moisture areas due to weather, steam, or wash down procedures.
- Areas where dirt, dust, mud, sand, etc. interferes with equipment operation.
- Prevention of accidental equipment operation.
- Instances requiring equipment lockout/tagout.

#### Quick Access Open Front Cover

- Areas requiring quick access to control device.
- Areas of high moisture from weather or dripping liquid.
- Prevention of accidental equipment operation.
- Areas with possible damage from bumping or banging.

### Features and Benefits:

- Clear UV stabilized Lexan polycarbonate plastic allows the end-user to see enclosed controls and is strong enough to withstand the rough treatment found in the industrial workplace.
- Downtime due to weather or accidental bumping is eliminated and plant shutdowns caused by inoperable or accidentally operated pushbutton devices are non-existent.
- Lockout/tagout capabilities conform to OSHA requirements and provides increased personnel safety.
- Quick and easy slip on installation requires no tools or interruption of service.
- Hinged cover provides superior sealing through heavy duty neoprene gaskets.
- Colored covers are available (e.g. red for emergency, yellow for fire alarm, etc.).
- Specific chemical-resistant covers available (may not be clear) - consult factory for minimum order quantity.
- Capability to engineer cover to fit any size device - consult factory.

### Hinged Covers

| Single Gang Application            | Cat. #        |
|------------------------------------|---------------|
| EDS(C) and EFD(C) control stations | NC CH1        |
| EFS(C) control stations            | NC CH1 EFS    |
| MC(C) control stations             | NC CH1 MC     |
| FS(C) back box with cover assembly | NC CH1 FS     |
| FD(C) back box with cover assembly | NC CH1 FD     |
| EGF11 and EGF12 (Ground Fault)     | NC CH1 EGF 11 |
| N2S(C) Krydon: 1 & 2 devices       | NC CH1 N2S    |
| N2D(C) Krydon: 1 & 2 devices       | NC CH1 N2D    |
| GHG432 control station             | NC CH1 GHG    |
| Single Gang (Long) Application     | Cat. #        |
| EFD(C) (3 device)                  | NC CH1 3L     |
| N2S(C) Krydon: 3 devices           | NC CH1 N2S 3L |
| N2S(C) Krydon: 4 devices           | NC CH1 N2S 4L |
| Double Gang Application            | Cat. #        |
| EDS(C) control stations            | NC CH2        |
| EDSCM32: 2 gang tandem             | NC CH2L       |
| EDSCM33: 3 gang tandem             | NC CH3L       |
| FS(C) back box with cover          | NC CH2 FS     |
| FD(C) back box with cover          | NC CH2 FD     |
| EDSC378 - 3 gang tandem assembly   | NC CH1 MC3    |

### Open Front Covers

| Single Gang Application            | Cat. #           |
|------------------------------------|------------------|
| EDS(C) and EFD(C) control stations | NC CH1 QA        |
| EFS(C) control stations            | NC CH1 EFS QA    |
| MC(C) control stations             | NC CH1 MC QA     |
| FS(C) back box with cover assembly | NC CH1 FS QA     |
| FD(C) back box with cover assembly | NC CH1 FD QA     |
| EGF11 and EGF12 (Ground Fault)     | NC CH1 EGF QA    |
| N2S(C) Krydon: 2 device assembly   | NC CH1 N2S QA    |
| N2D(C) Krydon: 3 device assembly   | NC CH1 N2D QA    |
| Single Gang (Long) Application     | Cat. #           |
| EFD(C): 3 device control stations  | NC CH1 3L QA     |
| N2S(C) Krydon: 3 device assembly   | NC CH1 N2S 3L QA |
| N2S(C) Krydon: 4 device assembly   | NC CH1 N2S 4L QA |
| Double Gang Application            | Cat. #           |
| EDS(C) control stations            | NC CH2 QA        |
| EDSCM32: 2 gang tandem             | NC CH2L QA       |
| EDSCM 33: 3 gang tandem            | NC CH3L QA       |
| FS(C) back box with cover assembly | NC CH2 FS QA     |
| FD(C) back box with cover assembly | NC CH2 FD QA     |

Custom covers can be supplied but must be accompanied by either a sample of the device to be covered or a copy of a drawing with all actual measurements of the device to be covered. Covers can also be color-coded. Consult factory.

**Crouse-Hinds**  
by **E.T.N**

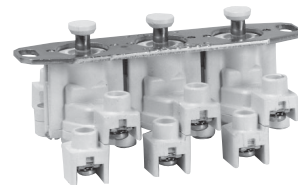
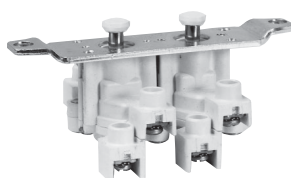
# Replacements for Pushbutton and Selector Switch Control Stations

4C

600 VAC Heavy Duty

## ED Series Pushbutton Contacts (for control stations built in 1996 or earlier)

Complete with Mounting Strap and Hardware



### Where Used

MC pushbutton stations and selector switches  
OAC pushbutton stations and selector switches  
EWC pushbutton stations  
EMP selector switches  
DSD962 pushbutton cover

1 Circuit  
Universal



Cat. #

ED11

ED21

-

ED38

-

2 Circuits  
Universal



Cat. #

ED12†

ED22†

ED32†

-

-

2 Circuits  
1 Open - A  
1 Closed - B



Cat. #

ED12†

ED22†

ED32†

-

-

3 Circuits  
Universal



Cat. #

-

-

-

ED13

-

## FlexStation Series Pushbutton Contacts (for control stations built in 1997 or later)

Contact Block without Mounting Strap



### Where Used

EDS and EFS pushbutton stations and selector switches  
DSD962 pushbutton cover

1 Circuit  
Universal



Cat. #

ESWP126

-

2 Circuits  
Universal



Cat. #

ESWP126 (2)

-

2 Circuits  
1 Open - A  
1 Closed - B

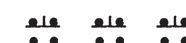


Cat. #

ESWP126 (2)

-

3 Circuits  
Universal



Cat. #

-

ESWP126 (3)

## Contact Ratings

| Volts                          | Max. Current<br>(Amperes) |       | Voltamperes |       | Continuous<br>Current<br>(Amperes) |
|--------------------------------|---------------------------|-------|-------------|-------|------------------------------------|
|                                | Make                      | Break | Make        | Break |                                    |
| 600 VAC Heavy Duty (NEMA A600) |                           |       |             |       |                                    |
| 120                            | 60                        | 6.0   | 7200        | 720   | 10                                 |
| 240                            | 30                        | 3.0   | 7200        | 720   | 10                                 |
| 480                            | 15                        | 1.5   | 7200        | 720   | 10                                 |
| 600                            | 12                        | 1.2   | 7200        | 720   | 10                                 |
| Direct Current (NEMA P150)     |                           |       |             |       |                                    |
| 125                            | 1.1                       | 1.1   | 138         | 138   | 5                                  |

## External Operating Buttons



CF859



CF705

### Where Used

MC, EFS, and EFD – current design with nylon guards

EMPS019, EMP019, EMPS029 and EMP029 – single operator FS, EFS, and EFD – previous design with aluminum guards

### Colors Available

Red, Green, Black

Red, Green, Black

### Cat. #

CF859 K1 ①

CF705-K1 ①

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |
|-------|-----|-------|-----------|
| START | OFF | RESET | LIGHT ON  |
| STOP  | RUN | TRIP  | HAND      |
| ON    | JOG | TEST  | AUTOMATIC |

|           |       |      |       |
|-----------|-------|------|-------|
| EMERGENCY | OPEN  | DOWN | RAISE |
| FORWARD   | CLOSE | IN   | LOWER |
| REVERSE   | UP    | OUT  |       |

Note: CF859-K1 and CF705-K1 come with 5 buttons.

† Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

‡ Use CF705-K1 for DEV11 and DEV12. To order DL legend plates see page 516 for markings.

**Crouse-Hinds**

by **E•T•N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

571





| Description                                             | Page No.          |
|---------------------------------------------------------|-------------------|
| <b>Controls for Bulk Solids Handling</b>                |                   |
| AFA / AFAX Conveyor Alignment Switches                  | see page 589      |
| AFU / AFUX Conveyor Control Safety Switches             | see page 588      |
| <b>Custom Control Panels</b>                            |                   |
| EJB Series                                              | see pages 576–581 |
| <b>Ground Fault Control Stations</b>                    |                   |
| EGF Series                                              | see page 595      |
| <b>Grounding Indication / Control</b>                   |                   |
| EGL Series                                              | see page 587      |
| <b>Lighting Contactors</b>                              |                   |
| XLC Series                                              | see pages 574–575 |
| <b>Mine Signal Switches</b>                             |                   |
| AFU Series                                              | see page 590      |
| <b>Pendant Pushbutton Stations</b>                      |                   |
| FLEXITITE™ Series                                       | see pages 593–594 |
| FLEXITITE™ D2X Series                                   | see pages 591–592 |
| <b>Pushbuttons, Pilot Lights, and Selector Switches</b> |                   |
| EMP Series                                              | see page 584      |
| <b>Timers</b>                                           |                   |
| DSD-TS Series                                           | see page 596      |

Explosionproof lighting contactors provide efficient use of power, greater utilization of daylight, and automated control in the most extreme harsh and hazardous locations while extending lighting lifetime.

## Applications:

- Areas requiring safe and efficient variable lighting control
- Areas with hazardous gas, vapors, and dust
- Indoor or outdoor locations in damp, wet, dusty, or corrosive environments

## Features:

- Variable lighting control utilizing manual on/off or automatic settings
- Photocell option provides maximum utilization of sunlight for energy conservation
- Modular lighting contactor design provides flexibility to add future power poles
- Lighting contacts are electrically held for superior performance
- Power poles convert from NO to NC with a simple 180° turn

### Standard configuration includes:

- EJB121208 enclosure with mounting plate, hinges, and breather/drain
- Captive, triple lead, quick release, hex head stainless steel bolts with spring-loaded action
- Tap-in mounting feet offer simple and secure installation and are easily replaceable
- Special neoprene cover gasket provides a watertight seal to meet NEMA requirements
- Internal neutral and ground bar
- Electrically held modular lighting contactor
- Two 3/4" NPT control conduit entries - one on top and one on bottom
- Twelve 1" NPT power conduit entries - six on top and six on bottom
- DSL nameplates are standard for all operator positions and Lamacoid nameplates are available upon request

## Certifications and Compliances:

- Class I, Divisions 1 & 2, Groups B, C, D
- Class I, Zones 1 & 2
- Class II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- NEMA 3, 7BCD, 9EFG
- UL Standard: 1203
- cUL to CSA Standard C22.2 No. 30
- Ex d IIB + H<sub>2</sub>

## Standard Materials:

- Body and cover – copper-free aluminum
- Gasket – neoprene
- Cover bolts – stainless steel
- Hinges – stainless steel

## Electrical Ratings\*:

- Voltage: 120V
- Amperage: 30A
- Number of Poles: 1-12 standard

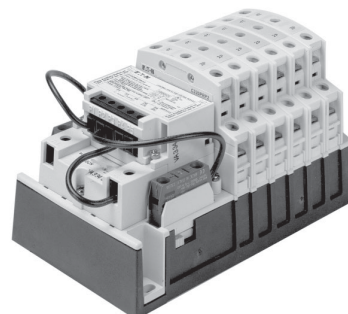
## Options:

| Description                          | Suffix |
|--------------------------------------|--------|
| Terminal block**                     | TB     |
| Timer**                              | TR     |
| EV2IH20 photocell (120V)             | PC1    |
| EV2IH208 277 photocell (208-277V)*   | PC2    |
| Epoxy finish (external)              | S752   |
| Epoxy finish (internal and external) | S753   |
| Lamacoid Nameplate                   | LID    |
| Heater                               | R11    |

## Ordering Information:

Amps = 30A

| Poles | 120V     |
|-------|----------|
| 2     | XLC30A2  |
| 3     | XLC30A3  |
| 4     | XLC30A4  |
| 5     | XLC30A5  |
| 6     | XLC30A6  |
| 7     | XLC30A7  |
| 8     | XLC30A8  |
| 9     | XLC30A9  |
| 10    | XLC30A10 |
| 11    | XLC30A11 |
| 12    | XLC30A12 |



Example of lighting contactor within the XLC solution



## EMP Operator Positions:

|    |    |
|----|----|
| 1. | 2. |
| 3. | 4. |

Additional EMP operators available, see page 581

Photocells are shipped separate for field installation.

\*Additional configurations are available upon request. Please contact Customer Service for details.

\*\*Timer and/or terminal block may require larger enclosure.

XLC Explosionproof  
Lighting Contactors

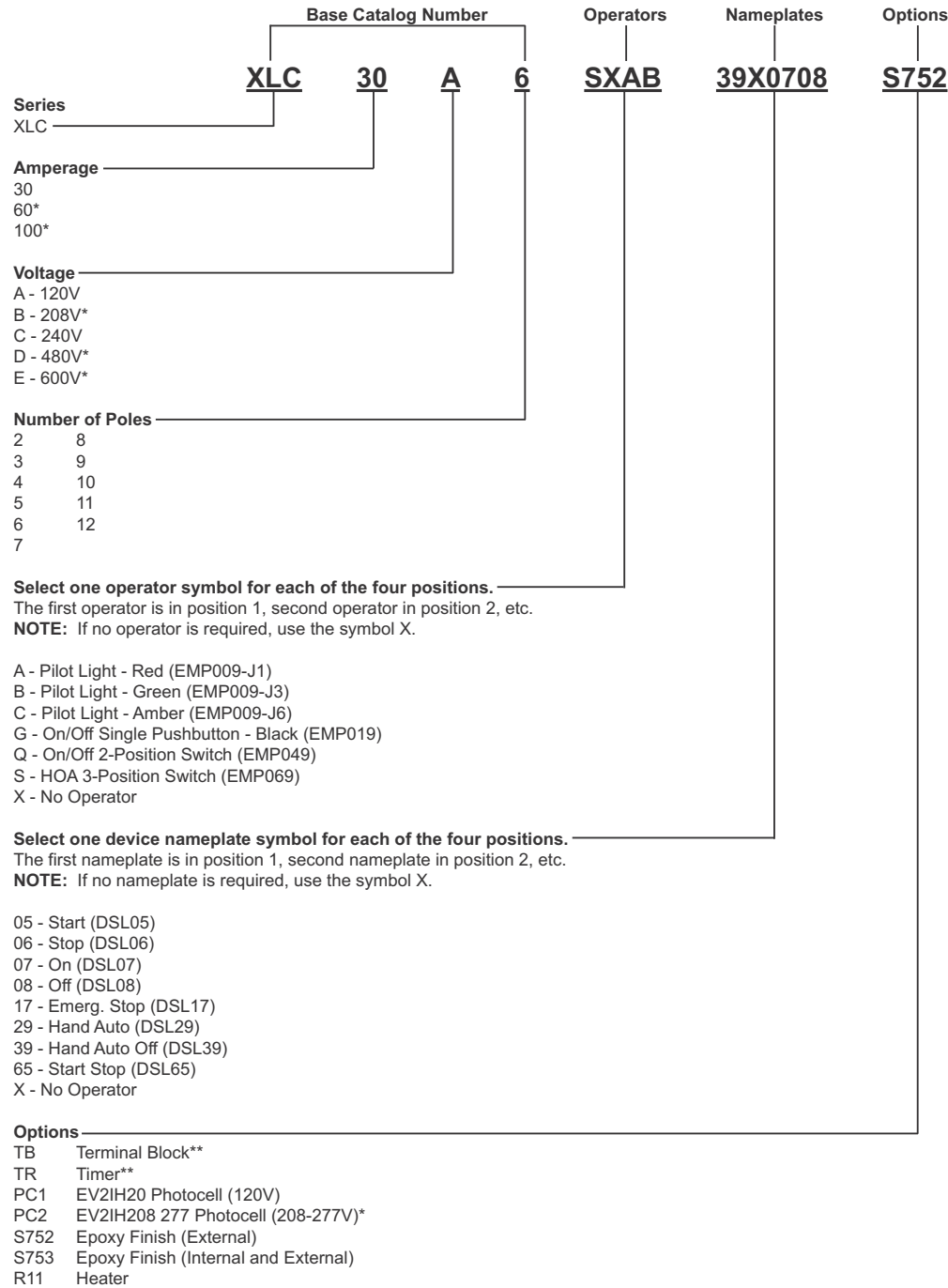
Cl. I, Div. 1 & 2, Groups B, C, D      NEMA 3, 7BCD, 9EFG  
Cl. I, Zones 1 & 2  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III

5C

Catalog Number Example: XLC30A6SXAB39X0708

XLC Lighting Contactor, 30A, 120V, 6 pole, HOA 3-position switch in position 1, no operator in position 2, red pilot light in position 3, green pilot light in position 4, HOA DSL in position 1, no DSL in position 2, ON DSL in position 3, OFF DSL in position 4.

Catalog Numbering Example:



Additional EMP operators available, see page 581  
Photocells are shipped separate for field installation.  
\*Additional configurations are available upon request. Please contact Customer Service for details.  
\*\*Timer and/or terminal block may require larger enclosure.

5C

## 5C EJB Custom-Built Control Panels

**Globally Certified—Individually Customized**

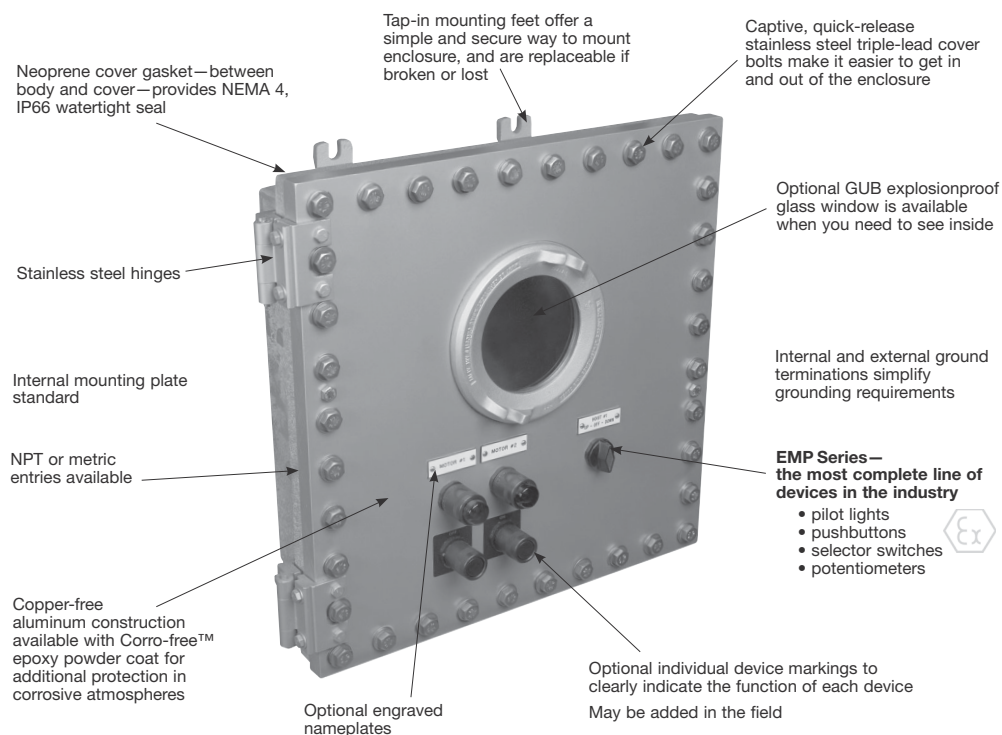
Cl. I, Div. 1 & 2, Groups B\*, C, D    UL and cUL approved  
Cl. I, Zones 1 & 2    Ex d IIB + H<sub>2</sub> T6  
Cl. II, Div. 1, Groups E, F, G    Certified to ATEX Directive†  
Cl. II, Div. 2, Groups F, G    NEMA 3, 7B\*CD, 9EFG  
Cl. III    IP66

The following pages will assist you in choosing the combination of features suited to your needs and requirements. The easy, five-step process will take you through the specification of cover openings, specifying devices, drilled and tapped conduit openings, device locations, and legend and nameplate selection.

After filling out your separate order form for each panel, fax it to your local Eaton's Crouse-Hinds Distributor. Please consult the factory for alternatives not detailed in these pages, such as other conduit arrangements, terminal blocks, or circuit breaker operating handles.

### Features:

- The foundation of the Custom-Built Control Panel is our tried and tested copper-free aluminum EJB enclosure. This corrosion resistant, heavy-duty enclosure features bolted construction, stainless steel hinges, and flexible tap-in mounting feet.



### Certifications and Compliances:

#### EJB Custom Control Panels

- NEC/CEC:
  - Class I, Divisions 1 & 2, Groups B\*, C and D
  - Class I, Zones 1 & 2
  - Class II, Division 1, Groups E, F and G
  - Class II, Division 2, Groups F and G
  - Class III
- NEMA: 3, 4, 7B\*CD, 9EFG
- cUL to CSA Standard C22.2 No. 30—C22.2 No. 25 Cl. II (E, F, G)
- Ex d IIB + H<sub>2</sub> T6
- UL Standard 1203
- IP66
- Certified to the ATEX Directive when ordered with -ATEX suffix.
- Custom Control Panel is component certified only. For assembly certification, please consult factory.

\*Groups C and D only when ordered with GUB window.

† Certified to the ATEX Directive when ordered with ATEX suffix.

### ATEX Certifications

- EJB Enclosure with Conduit Entries & Device Holes  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS08ATEX15797U
- EMP Devices  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS07ATEX15652U
- GUB0108 ATEX Window  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS07ATEX15638U
- ECD Breather/Drain  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS07ATEX15639U

## Globally Certified—Individually Customized

Ordering and receiving Eaton's Crouse-Hinds EJB Custom-Built Control Panels is now easier and faster than ever. Follow the steps below, fill out a separate order form for each panel, and fax it to your local Eaton's Crouse-Hinds Distributor. It's as simple as that!

## Easy Five Step Ordering Process:

- 1 Specify cover openings and devices.
- 2 Specify conduit openings.
- 3 Determine device arrangement.
- 4 Specify device location.
- 5 Specify legend and nameplates.

## Step 1

Specify the openings required for the cover of the enclosure.

Indicate in Section 1 of the order form the combination of devices, openings without devices, and windows required.

Total the number of device openings required based on the devices, openings and windows specified in Section 1.

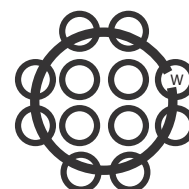
Using Table 1, you can determine the smallest size enclosure required based upon the total number of devices/openings and the number of devices a window requires. (NOTE: The actual size of your custom panel enclosure may change based on the number and size of your entry requirements.)

TABLE 1

DEVICE AND WINDOW INFORMATION

| Total # of Device Openings Available |   | Device Layout |   |   | EJB Enclosure Catalog Number |
|--------------------------------------|---|---------------|---|---|------------------------------|
| 9                                    | = | 3             | X | 3 | EJB100806                    |
| 16                                   | = | 4             | X | 4 | EJB121204                    |
| 16                                   | = | 4             | X | 4 | EJB121206                    |
| 16                                   | = | 4             | X | 4 | EJB121208                    |
| 36                                   | = | 6             | X | 6 | EJB161606                    |
| 36                                   | = | 6             | X | 6 | EJB161608                    |
| 24                                   | = | 6             | X | 4 | EJB181206                    |
| 24                                   | = | 6             | X | 4 | EJB181208                    |
| 36                                   | = | 9             | X | 4 | EJB241208                    |
| 36                                   | = | 9             | X | 4 | EJB241210                    |
| 54                                   | = | 9             | X | 6 | EJB241808                    |
| 54                                   | = | 9             | X | 6 | EJB241810                    |
| 81                                   | = | 9             | X | 9 | EJB242408                    |
| 81                                   | = | 9             | X | 9 | EJB242410                    |
| 52                                   | = | 13            | X | 4 | EJB361208                    |
| 78                                   | = | 13            | X | 6 | EJB361808                    |
| 78                                   | = | 13            | X | 6 | EJB361810                    |
| 117                                  | = | 13            | X | 9 | EJB362408                    |

Requires same area as 12 devices.  
May be installed in all boxes.



GUB0108—Symbol W  
4-3/4" dia. viewing area

SIZE REQUIREMENTS

| EJB Size         | Max. No. Windows |
|------------------|------------------|
| 121204 to 181208 | 1                |
| 241208 to 362408 | 2                |

## Globally Certified—Individually Customized

## Step 2

**Specify the number, size and location of conduit openings required on the sides, top and bottom of the enclosure body using the information in Tables 2, 3, and 4.**

Refer to Table 2 to determine if the enclosure selected in Step 1 will accommodate the required conduit openings.  
From Table 3, determine the symbol(s) that correspond with the required conduit openings.

**Place these symbols in the desired positions using the conduit arrangement diagrams in Table 4.**

Any combination of the four arrangement diagrams may be used per side and all positions on a side with openings must have a symbol. The side number (1, 2, 3 or 4) must precede the conduit opening(s) symbols for the respective side. When a side of the enclosure does not require any conduit openings, the side number is omitted from the catalog number.

**Enter the complete catalog number, including conduit opening designations, in Section 2 of the order form. Indicate on which side the hinges should be mounted. Check boxes in Section 2 for options desired.**

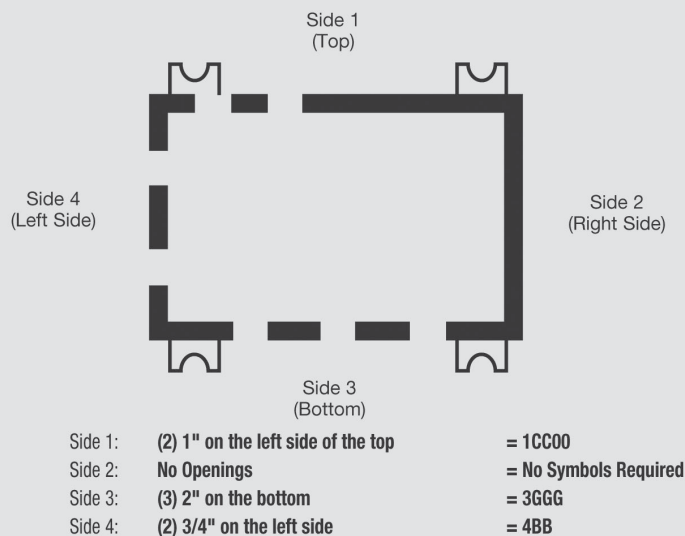
## Example:

In Step 1, customer selects an EJB161606 based on the number of devices/openings specified (See Section 1 of sample order form). The following conduit openings are required: (2) 1" on the left side of the top; no openings on the right side; (3) 2" on the bottom; and (2) 3/4" on the left side.

Table 2 indicates the maximum size allowed for three conduit openings in an EJB161606 is 2-1/2". Therefore, an EJB161606 would be suitable.

Table 3 indicates a 3/4" opening is symbol B, a 1" opening is symbol C, a 2" opening is symbol G and no opening is a 0.

Using the conduit arrangement diagrams in Table 4, place the symbols for the desired openings in the appropriate positions. Remember, any combination of the four arrangement diagrams may be used and all positions on a side with openings must have a symbol even if no opening is required in a particular position.



Complete catalog number is: **EJB161606- 1CC003GGG4BB**. Enter the completed catalog number, including conduit opening designations, in Section 2 of the order form. Indicate on which side the hinges should be mounted.



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TABLE 2

CONDUIT ARRANGEMENTS

| CAT #                       | Maximum Trade Size and Number of Openings |       |       |       |            |       |       |       | Spacing Dimensions |        |         |        |        |        |        |  |
|-----------------------------|-------------------------------------------|-------|-------|-------|------------|-------|-------|-------|--------------------|--------|---------|--------|--------|--------|--------|--|
|                             | Top and Bottom (bb)                       |       |       |       | Sides (aa) |       |       |       |                    |        |         |        |        |        |        |  |
|                             | 1                                         | 2     | 3     | 4     | 1          | 2     | 3     | 4     | S                  | T      | U       | V      | W      | X      | Y      |  |
| Drilled and Tapped Openings |                                           |       |       |       |            |       |       |       |                    |        |         |        |        |        |        |  |
| EJB100806                   | 3-1/2                                     | 3     | 1-1/2 | 1-1/4 | 3-1/2      | 2-1/2 | 1-1/4 | 3/4   | 3-3/4              | 2-5/16 | 1-15/16 | 2-3/4  | 2-1/2  | 2-1/2  | 1-3/4  |  |
| EJB121204                   | 1-1/2                                     | 1-1/2 | 1-1/2 | 1-1/4 | 1-1/2      | 1-1/2 | 1-1/2 | 1-1/4 | 3                  | 2-1/4  | 2-1/4   | 3-5/8  | 3-5/8  | 3-1/16 | 3-1/16 |  |
| EJB121206                   | 3-1/2                                     | 3-1/2 | 1-1/2 | 1-1/4 | 3-1/2      | 3-1/2 | 1-1/2 | 1-1/4 | 3-3/4              | 3      | 3       | 3-5/8  | 3-5/8  | 3-1/16 | 3-1/16 |  |
| EJB121208                   | 5                                         | 3-1/2 | 1-1/2 | 1-1/4 | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 4-3/4              | 3      | 3       | 3-5/8  | 3-5/8  | 3-1/16 | 3-1/16 |  |
| EJB161606                   | 3-1/2                                     | 3-1/2 | 2-1/2 | 2     | 3-1/2      | 3-1/2 | 2-1/2 | 2     | 3-3/4              | 3      | 3       | 4-5/8  | 4-5/8  | 4-3/16 | 4-3/16 |  |
| EJB161608                   | 5                                         | 5     | 3     | 2     | 5          | 5     | 3     | 2     | 4-3/4              | 3-1/4  | 3-1/4   | 6      | 4-5/8  | 4-3/16 | 4-3/16 |  |
| EJB181206                   | 3-1/2                                     | 3-1/2 | 3-1/2 | 2-1/2 | 3-1/2      | 3-1/2 | 1-1/2 | 1-1/4 | 3-3/4              | 3      | 3       | 6      | 3-5/8  | 4-5/8  | 3-1/16 |  |
| EJB181208                   | 5                                         | 5     | 3-1/2 | 2-1/2 | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 4-3/4              | 4-3/16 | 3       | 6      | 3-5/8  | 4-5/8  | 3-1/16 |  |
| EJB241208                   | 5                                         | 5     | 5     | 3-1/2 | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 5-1/8              | 4-3/16 | 3       | 8-7/16 | 3-5/8  | 6      | 3-1/16 |  |
| EJB241210                   | 6                                         | 6     | 5     | 3-1/2 | 6          | 3-1/2 | 1-1/2 | 1-1/4 | 6-1/8              | 4-3/4  | 3       | 8-7/16 | 3-5/8  | 6      | 3-1/16 |  |
| EJB241808                   | 5                                         | 5     | 5     | 3-1/2 | 5          | 5     | 3-1/2 | 2-1/2 | 5-1/4              | 4-3/16 | 4-3/16  | 8-7/16 | 6      | 6      | 4-5/8  |  |
| EJB241810                   | 6                                         | 6     | 5     | 3-1/2 | 6          | 6     | 3-1/2 | 2-1/2 | 6-1/4              | 4-3/4  | 4-3/4   | 8-7/16 | 6      | 6      | 4-5/8  |  |
| EJB242408                   | 5                                         | 5     | 5     | 3-1/2 | 5          | 5     | 5     | 3-1/2 | 5-3/8              | 4-3/16 | 4-3/16  | 8-7/16 | 8-7/16 | 6      | 6      |  |
| EJB242410                   | 6                                         | 6     | 5     | 3-1/2 | 6          | 6     | 5     | 3-1/2 | 6-3/8              | 4-3/4  | 4-3/4   | 8-7/16 | 8-7/16 | 6      | 6      |  |
| EJB361208                   | 5                                         | 5     | 5     | 5     | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 4-3/4              | 4-7/16 | 3       | 8-7/16 | 3-5/8  | 8-7/16 | 3-1/16 |  |
| EJB361808                   | 5                                         | 5     | 5     | 5     | 5          | 5     | 3-1/2 | 2-1/2 | 5-1/2              | 4-7/16 | 4-7/16  | 8-7/16 | 6      | 8-7/16 | 4-5/8  |  |
| EJB361810                   | 6                                         | 6     | 5     | 5     | 6          | 6     | 3-1/2 | 2-1/2 | 6-1/2              | 4-3/4  | 4-3/4   | 8-7/16 | 6      | 8-7/16 | 4-5/8  |  |
| EJB362408                   | 5                                         | 5     | 5     | 5     | 5          | 5     | 5     | 3-1/2 | 6                  | 4-3/16 | 4-3/16  | 8-7/16 | 8-7/16 | 8-7/16 | 6      |  |

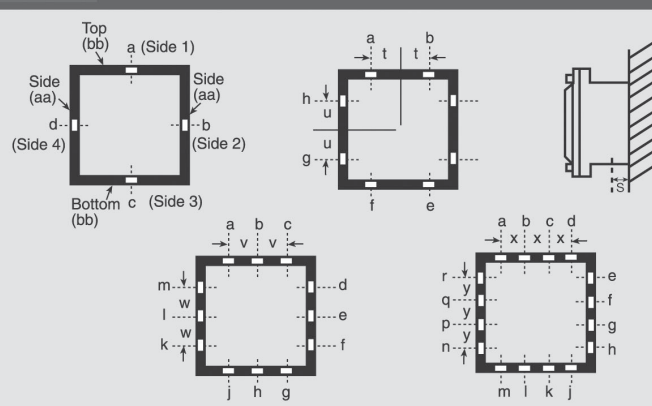
TABLE 3

SYMBOLS FOR OPENINGS

| NPT Conduit Size | Drilled & Tapped Hole Symbol | Metric Openings | Drilled & Tapped Hole Symbol |
|------------------|------------------------------|-----------------|------------------------------|
| 1/2              | A                            | M16             | AM                           |
| 3/4              | B                            | M20             | BM                           |
| 1                | C                            | M25             | CM                           |
| 1-1/4            | E                            | M32             | EM                           |
| 1-1/2            | F                            | M40             | FM                           |
| 2                | G                            | M50             | GM                           |
| 2-1/2            | H                            | M63             | HM                           |
| 3                | J                            |                 |                              |
| 3-1/2            | K                            |                 |                              |
| 4                | L                            |                 |                              |
| 5                | M                            |                 |                              |
| 6                | N                            |                 |                              |

TABLE 4

CONDUIT ARRANGEMENT DIAGRAMS



## Step 3

Based upon the EJB selected, use Section 3 of the order form and outline the maximum number of columns and rows available (from Table 1) beginning in the upper left corner. Fill in the length of each side in the space provided.

Note that the left side will be hinged unless otherwise specified in Section 2. In our example, an EJB161606 was selected and according to Table 1, a total of 36 device spaces are available (6 columns and 6 rows). See sample order form.

## Step 4

Place the appropriate letter symbol from Section 1 of the order form in the position you desire the devices or openings to be located. If a window is required, outline the position and number of spaces the window will occupy and place the symbol of the window (w) in the center.

Note that 2 windows per enclosure can be used. If more windows are required contact factory. (See appropriate window information in the sample order form)



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## Step 5

Indicate the desired device marking (DSL legend plate) or engraved plate for each device or window in Section 4 of the order form.

Engraved plates will be located above the device or window and are white letters on a black background. If an engraved plate is desired, fill in desired wording on engraved plate (up to 2 lines) on Section 4 of order form. If a device marking is required on EMP device, insert the DSL catalog number from those listed below (Table 5) on Section 4 of order form under column labeled "Device Marking." Be sure to specify the row and column location of the EMP device being marked. See sample order form.

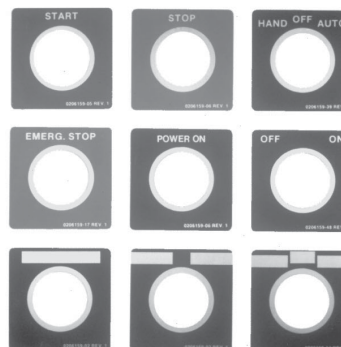
That's it. *It's that simple.* Now fax the order form to your local Eaton's Crouse-Hinds Distributor.

TABLE 5

LEGEND PLATE SELECTOR CHART

Use the charts below to select the appropriate legend plate(s) for your application. Markings shown in **bold print** are etched; all others are stamped.

| Single Function Legend Plates |        | Double Function Legend Plates |        | Triple Function Legend Plates                                                        |              |
|-------------------------------|--------|-------------------------------|--------|--------------------------------------------------------------------------------------|--------------|
| Marking                       | Cat #. | Marking                       | Cat #. | Marking                                                                              | Cat #.       |
| Automatic                     | DSL16  | Blank with 2 fields           | DSL03  | Auto-Off-Hand                                                                        | DSL49        |
| Blank                         | DSL01  | <b>For-Rev</b>                | DSL30  | Blank with 3 fields                                                                  | DSL04        |
| Blank with single field       | DSL02  | Hand-Auto                     | DSL29  | Fast-Off-Slow                                                                        | DSL41        |
| <b>Close</b>                  | DSL21  | In-Out                        | DSL35  | <b>For-Off-Rev</b>                                                                   | DSL40        |
| <b>Down</b>                   | DSL23  | <b>Off-On</b>                 | DSL48  | <b>Hand-Off-Auto</b>                                                                 | <b>DSL39</b> |
| <b>Emerg. Stop</b>            | DSL17  | <b>Open-Close</b>             | DSL32  | <b>Run-Off-Jog</b>                                                                   | <b>DSL38</b> |
| Fast                          | DSL46  | Raise-Lower                   | DSL36  | <b>Open-Off-Close</b>                                                                | DSL43        |
| Forward                       | DSL18  | <b>Run-Jog</b>                | DSL28  | Raise-Off-Lower                                                                      | DSL87        |
| Hand                          | DSL15  | Safe-Run                      | DSL86  | Slow-Off-Fast                                                                        | DSL88        |
| In                            | DSL24  | Start-Stop                    | DSL37  | Up-Off-Down                                                                          | DSL44        |
| Jog                           | DSL10  | Slow-Fast                     | DSL65  | 1-Off-2                                                                              | DSL42        |
| Lower                         | DSL27  | <b>Up-Down</b>                | DSL33  | Note: Background color for all legend plates is black with the following exceptions: |              |
| <b>On</b>                     | DSL07  |                               |        |                                                                                      |              |
| <b>Off</b>                    | DSL08  |                               |        |                                                                                      |              |
| <b>Open</b>                   | DSL20  |                               |        |                                                                                      |              |
| Out                           | DSL25  |                               |        |                                                                                      |              |
| Power On                      | DSL14  |                               |        | Marking                                                                              | Plate Color  |
| Raise                         | DSL26  |                               |        | Start                                                                                | Green        |
| Reset                         | DSL12  |                               |        | Stop                                                                                 | Red          |
| Reverse                       | DSL19  |                               |        | Emerg. Stop                                                                          | Red          |
| Run                           | DSL09  |                               |        |                                                                                      |              |
| <b>Safe</b>                   | DSL85  |                               |        |                                                                                      |              |
| Slow                          | DSL47  |                               |        |                                                                                      |              |
| <b>Start</b>                  | DSL05  |                               |        |                                                                                      |              |
| <b>Stop</b>                   | DSL06  |                               |        |                                                                                      |              |
| <b>Test</b>                   | DSL13  |                               |        |                                                                                      |              |
| Trip                          | DSL11  |                               |        |                                                                                      |              |
| <b>Up</b>                     | DSL22  |                               |        |                                                                                      |              |



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Please photocopy and fax all pages of order form (Sections 1-4) to your local Eaton’s Crouse-Hinds Distributor.

Section 1: EMP Style Operators—UL, cULus and ATEX

Number of Devices: Indicate the Number of Devices, Openings Without Devices and Window(s) Required.

| Pilot Lights       |         |        |          |
|--------------------|---------|--------|----------|
|                    | Diagram | Symbol | Quantity |
| EMP009-J1 (Red)    |         | A      | _____    |
| EMP009-J1-LED      |         | A1     | _____    |
| EMP0090-J1         |         | A2     | _____    |
| EMP0098-J1         |         | A4     | _____    |
| EMP009-J3 (Green)  |         | B      | _____    |
| EMP009-J3-LED      |         | B1     | _____    |
| EMP0090-J3         |         | B2     | _____    |
| EMP0098-J3         |         | B4     | _____    |
| EMP009-J6 (Amber)  |         | C      | _____    |
| EMP009-J6-LED      |         | C1     | _____    |
| EMP0090-J6         |         | C2     | _____    |
| EMP0098-J6         |         | C4     | _____    |
| EMP009-J10 (Clear) |         | E      | _____    |
| EMP0090-J10        |         | E2     | _____    |
| EMP0098-J10        |         | E4     | _____    |
| EMP009-J11 (Blue)  |         | F      | _____    |
| EMP0090-J11        |         | F2     | _____    |
| EMP0098-J11        |         | F4     | _____    |

| Pushbuttons—Single Pushbutton |         |        |          |
|-------------------------------|---------|--------|----------|
|                               | Diagram | Symbol | Quantity |
| EMP019 (Black)                |         | G      | _____    |
| EMP019 (Red)                  |         | H      | _____    |
| EMP019 (Green)                |         | J      | _____    |
| EMP098 (Red)                  |         | K      | _____    |

| Pushbuttons—Double Pushbutton, Single Operator |         |        |          |
|------------------------------------------------|---------|--------|----------|
|                                                | Diagram | Symbol | Quantity |
| EMP029 (Black)                                 |         | L      | _____    |
| EMP029 (Red)                                   |         | M      | _____    |
| EMP029 (Green)                                 |         | N      | _____    |

| Pushbuttons—Double Pushbutton, Double Operator |         |        |          |
|------------------------------------------------|---------|--------|----------|
|                                                | Diagram | Symbol | Quantity |
| EMP039                                         |         | P      | _____    |

| Selector Switches – Two position |         |        |          |
|----------------------------------|---------|--------|----------|
|                                  | Diagram | Symbol | Quantity |
| EMP049                           |         | Q      | _____    |
| EMP059                           |         | R      | _____    |

| Selector Switches – Three position |         |        |          |
|------------------------------------|---------|--------|----------|
|                                    | Diagram | Symbol | Quantity |
| EMP069                             |         | S      | _____    |
| EMP069-S634                        |         | S4     | _____    |
| EMP069-S635                        |         | S5     | _____    |
| EMP079                             |         | T      | _____    |
| EMP079-S634                        |         | T4     | _____    |
| EMP079-S635                        |         | T5     | _____    |
| EMP089                             |         | U      | _____    |
| EMP089-S634                        |         | U4     | _____    |
| EMP089-S635                        |         | U5     | _____    |

| Selector Switches – Keyed Selector Switches |         |        |       |
|---------------------------------------------|---------|--------|-------|
|                                             | Diagram | Symbol | Qty   |
| EMP0491                                     |         | Q6     | _____ |
| EMP0492                                     |         | Q7     | _____ |
| EMP0493                                     |         | Q8     | _____ |
| EMP0591                                     |         | R6     | _____ |
| EMP0592                                     |         | R7     | _____ |
| EMP0593                                     |         | R8     | _____ |
| EMP0691                                     |         | S6     | _____ |
| EMP0692                                     |         | S7     | _____ |
| EMP0693                                     |         | S8     | _____ |
| EMP0694                                     |         | S9     | _____ |
| EMP0791                                     |         | T6     | _____ |
| EMP0792                                     |         | T7     | _____ |
| EMP0793                                     |         | T8     | _____ |
| EMP0794                                     |         | T9     | _____ |
| EMP0891                                     |         | U6     | _____ |
| EMP0892                                     |         | U7     | _____ |
| EMP0893                                     |         | U8     | _____ |
| EMP0894                                     |         | U9     | _____ |

Total Number of all Devices on this page \_\_\_\_\_

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Section 1: EMP Style Operators Continued

Number of Devices: Indicate the Number of Devices, Openings Without Devices and Window(s) Required.

|                                                  |  |        |          |
|--------------------------------------------------|--|--------|----------|
| Openings Without Devices ( For Future Expansion) |  |        |          |
| 3/4" - 14 NPSM Opening (plugged)                 |  | Symbol | Quantity |
|                                                  |  | V      | _____    |

|         |        |          |               |
|---------|--------|----------|---------------|
| Windows |        |          |               |
| GUB0108 | Symbol | Quantity | # of Openings |
|         | W      | _____    | _____         |

Total Number of all Device  
Openings from previous page \_\_\_\_\_

Total Number of all Devices /  
Openings from Section 1 \_\_\_\_\_

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Section 2

**Completed Catalog Number:**  
Specify the complete catalog number including conduit designations.

EJB \_\_\_\_\_

All Eaton's Crouse-Hinds Custom-Built Control Panels are provided with a mounting plate and hinges. Hinges are on left side of enclosure. If you desire hinges on one of the other sides, circle choice here: TOP RIGHT BOTTOM

Section 3—Exterior Front View

**Location of Devices and Windows in Cover:**  
Outline the cover space available, beginning in the upper left corner of the grid, based upon the EJB selected. See Table 1 for device layout.

Section 4

**Device Markings:**  
Indicate by row and column position markings/legends for each device.

**Engraved Plate:**  
Specify markings for each nameplate based upon the following:

| Maximum Number of Characters/Line |      |       |      |      |
|-----------------------------------|------|-------|------|------|
| Marking Size                      | 1/8" | 3/16" | 1/4" | 1/2" |
| Number of Characters              | 36   | 24    | 18   | 9    |

| Specify |        | Device Marking (DSL) or Engraved Plate Line 1 | Engraved Plate Line 2 | Marking Size |
|---------|--------|-----------------------------------------------|-----------------------|--------------|
| Row     | Column |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |

|                                       |               |
|---------------------------------------|---------------|
| Distributor:                          | Contact:      |
| Customer:                             | Phone Number: |
| EATON'S CROUSE-HINDS FACTORY USE ONLY |               |
| Catalog Number Entered:               |               |
| Reference #:                          | B#            |

**OPTIONS**

For any of the following options, check here:

☐ ATEX Certified (ATEX)

☐ Breather and Drain (S756V)

☐ Epoxy finish, external (S752)

☐ Epoxy finish, internal and external (S753)

| size   | Top (column)          |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|--------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|        | 1                     | 2                     | 3                     | 4                     | 5                     | 6                     | 7                     | 8                     | 9                     | 10                    | 11                    | 12                    | 13                    |
| A      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| B      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| C      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| D      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| J      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| K      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| L      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| M      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bottom |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |

Note: All device openings are spaced 2.62" center to center.

5C

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 II 2 G Ex d IIB + H<sub>2</sub>, T5 NEMA 3, 7BCD, 9EFG

As indicated in the listings, certain barrel assemblies are the same as those used in complete EMP units and may be utilized as replacements.

The remainder are primarily for use with hazardous area boxes to assemble special control stations. For additional information, see pages 576–583 describing custom-built control panels.

## Certifications and Compliances:

- Class I, Division 1 & 2, Groups B, C, D
- Class II, Division 2, Groups E, F, G
- Class III
- NEMA/IEEAC: 3, 7BCD, 9EFG
- UL Standard 1203
- CSA Standard C22.2 No 30
- CENELEC
- ATEX Certificate ITS07 ATEX 15652U

## Ordering Information:

Select the Cat. No. from the listings. For pilot lights and illuminated pushbuttons, specify color of jewel using symbols from the table below. For pushbuttons and selector switches, optional markings may be specified in the tables below.

### Group 1:

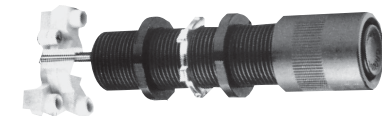
Standard assemblies are for replacement in complete EMP units or for custom-built control panels. Short assemblies are for custom-built control panels only. Both assemblies may be used with System 4 Control Stations.

### Pilot light†



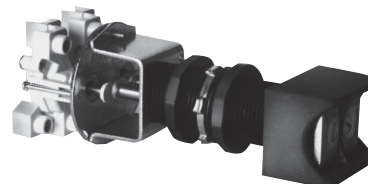
| Diagram | Standard Assembly Cat. # |
|---------|--------------------------|
| (120V)* | EMP009 ①                 |

### Single pushbutton Double pushbutton, single operator



| Diagram | Short Cat. # | Standard Cat. # |
|---------|--------------|-----------------|
|         | EMPS019 ②    | EMP019 ②        |
|         | EMPS029 ②    | EMP029 ②        |

### Double pushbutton, double operator



| Diagram | Short Assembly Cat. # | Standard Assembly Cat. # |
|---------|-----------------------|--------------------------|
|         | EMPS039 ②             | EMP039 ②                 |

### Two-position selector switch



| Diagram Position 1 | Position 2         | Short Assembly Cat. # | Standard Assembly Cat. # |
|--------------------|--------------------|-----------------------|--------------------------|
| A1<br>A2           | A1<br>A2           | EMPS049 ②             | EMP049 ②                 |
| A1<br>A2  B1<br>B2 | A1<br>A2  B1<br>B2 | EMPS059 ②             | EMP059 ②                 |

### Three-position selector switch

| Diagram Position 1 | Position 2         | Position 3         | Short Assembly Cat. # | Standard Assembly Cat. # |
|--------------------|--------------------|--------------------|-----------------------|--------------------------|
| A1<br>A2           | A1<br>A2           | A1<br>A2           | EMPS069 ②             | EMP069 ②                 |
| A1<br>A2  B1<br>B2 | A1<br>A2  B1<br>B2 | A1<br>A2  B1<br>B2 | EMPS079 ②             | EMP079 ②                 |
| A1<br>A2  B1<br>B2 | A1<br>A2  B1<br>B2 | A1<br>A2  B1<br>B2 | EMPS089 ②             | EMP089 ②                 |

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

②If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

#### Push Button Station Marking

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

† LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED to end of catalog number after last color symbol.

\* Other voltages available. Consult factory. For 24 VDC operation, add suffix S300.

‡ The following suffixes may be used with these catalog numbers: S634 - Momentary contact clockwise, spring return to center; S635 - Momentary contact counter-clockwise, spring return to center.

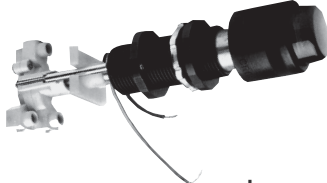
# EMP and EMPS Barrel Assemblies

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
II 2 G Ex d IIB + H<sub>2</sub>, T5 NEMA 3, 7BCD, 9EFG

5C

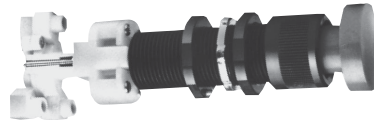
## Group 2: For custom-built control panels.

### Illuminated pushbutton†



| Diagram | Long Assembly Cat. # |
|---------|----------------------|
|         | EMP0090 ①            |
|         | EMP0098 ①            |

## Maintained Contact Pushbutton



| Diagram |        | Long Assembly Cat. # |
|---------|--------|----------------------|
| Up      | Down   |                      |
| A1  A2  | A1  A2 | EMP098 ②             |

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

## Two-position selector switch, key operated



②If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Push Button Station Marking

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

| Diagram    |            | Key Removal    | Short Assembly Cat. # | Standard Assembly Cat. # |
|------------|------------|----------------|-----------------------|--------------------------|
| Position 1 | Position 2 |                |                       |                          |
| A1         | A1         | Both positions | EMPS0491 ②            | EMP0491 ②                |
| A2         | A2         | Left only      | EMPS0492 ②            | EMP0492 ②                |
|            |            | Right only     | EMPS0493 ②            | EMP0493 ②                |
| A1  B1     | A1  B1     | Both positions | EMPS0591 ②            | EMP0591 ②                |
| A2  B2     | A2  B2     | Left only      | EMPS0592 ②            | EMP0592 ②                |
|            |            | Right only     | EMPS0593 ②            | EMP0593 ②                |

## Three-position selector switch, key operated

| Diagram    |            |            | Key Removal | Short Assembly Cat. # | Standard Assembly Cat. # ✱ |
|------------|------------|------------|-------------|-----------------------|----------------------------|
| Position 1 | Position 2 | Position 3 |             |                       |                            |
| A1         | A1         | A1         | All         | EMPS0691 ②            | EMP0691 ②                  |
| A2         | A2         | A2         | Center only | EMPS0692 ②            | EMP0692 ②                  |
|            |            |            | Left only   | EMPS0693 ②            | EMP0693 ②                  |
|            |            |            | Right only  | EMPS0694 ②            | EMP0694 ②                  |
| A1  B1     | A1  B1     | A1  B1     | All         | EMPS0791 ②            | EMP0791 ②                  |
| A2  B2     | A2  B2     | A2  B2     | Center only | EMPS0792 ②            | EMP0792 ②                  |
|            |            |            | Left only   | EMPS0793 ②            | EMP0793 ②                  |
|            |            |            | Right only  | EMPS0794 ②            | EMP0794 ②                  |
| A1  B1     | A1  B1     | A1  B1     | All         | EMPS0891 ②            | EMP0891 ②                  |
| A2  B2     | A2  B2     | A2  B2     | Center only | EMPS0892 ②            | EMP0892 ②                  |
|            |            |            | Left only   | EMPS0893 ②            | EMP0893 ②                  |
|            |            |            | Right only  | EMPS0894 ②            | EMP0894 ②                  |

† LED pilot lights can be furnished in place of standard incandescent pilot lamps.

Add suffix LED to end of catalog number after last color symbol.

✱ The following suffixes may be used with these catalog numbers: S634 - Momentary contact clockwise, spring return to center; S635 - Momentary contact counter-clockwise, spring return to center.

## Crouse-Hinds

by E.T.N

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585

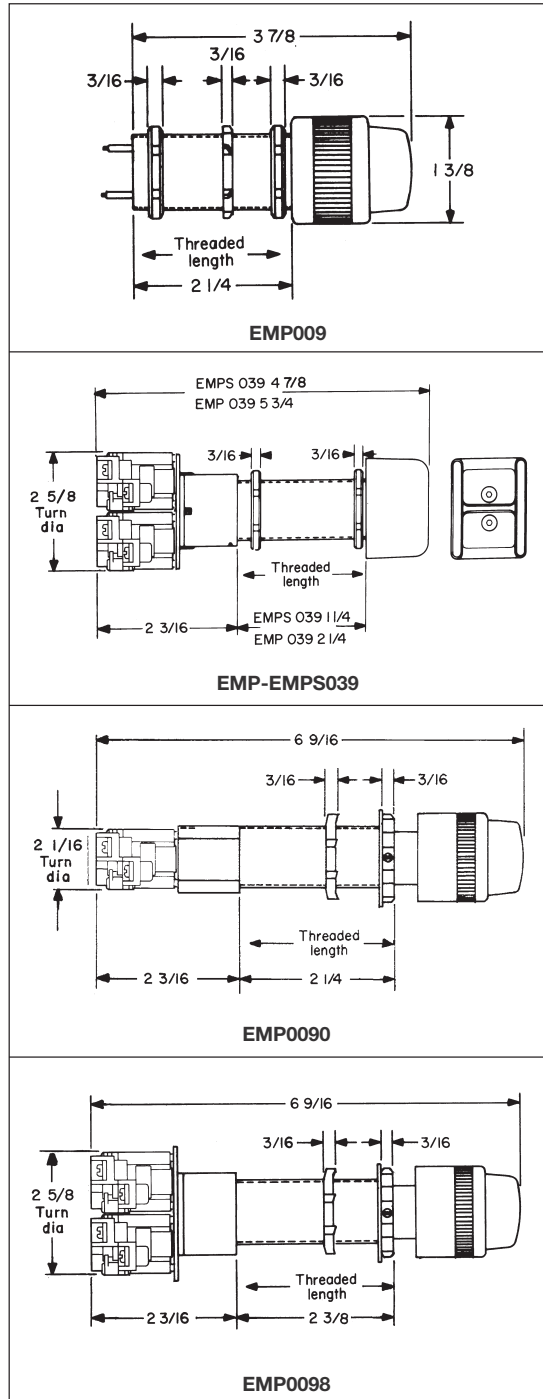
5C

# 5C

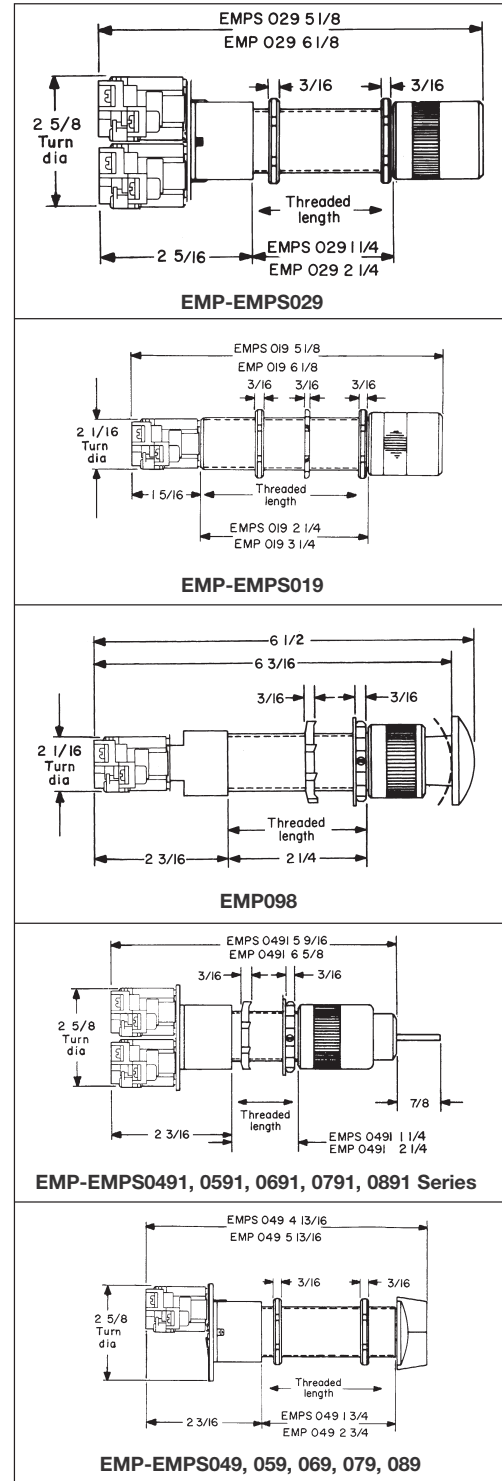
## EMP and EMPS Barrel Assemblies

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 II 2 G Ex d IIB + H<sub>2</sub>, T5 NEMA 3, 7BCD, 9EFG

### Dimensions\* In Inches:



\*Dimensions are approximate, not for construction purposes.  
 All barrel assemblies are 3/4"-14 NPSM thread size.



**Crouse-Hinds**  
 by **F.T.N**



# EGL Static Grounding Indicator

## With Automated Pump Control and Static Ground Verification System

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. I, Zone 1 & 2 IIB + H<sub>2</sub>  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III

UL/cUL Listed  
NEMA 3, 4X, 7BCD, 9FG, 12  
Explosionproof  
Dust-Ignitionproof  
Raintight / Wet Locations

5C

### Applications:

EGL Static Grounding Indicator is the ideal product for safe loading/unloading of ethanol, biofuel, petroleum, chemicals, plastics and other combustible materials. The EGL is mounted adjacent to loading/unloading areas and connected to transportation tank vehicles, railcars, drums or other portable containers to prevent explosions due to static discharge during product transfer by providing:

- A ground path for static build-up
- Automatic pump shutdown when static grounding circuit is broken
- Visual indication of safe, static grounding before, during and after loading and unloading operations

### Features and Benefits:

- Static ground verification system provides ground path for static build-up to ensure safe product transfer
- Integrated control relay allows for safe control of electrically operated pumps or valves, and for energizing remote indicators
- Stainless steel clamp for grounding connection provides industrial durability, corrosion resistance, and increased product lifetime
- Interior and exterior epoxy powdered paint finish provides superior corrosion resistance inside and out
- LED pilot lights provide long-lasting visual identification of status of ground connection
- ECD Type 4X drain protects interior equipment from environmental moisture and condensation, rain water, and hose-down applications
- NEMA 4X compact, hose-tight, and corrosion-resistant enclosure offers years of service in harsh industrial environments
- 25 ft. safety fluorescent yellow cord is easily identifiable to ensure safety and reduce tripping hazard
- Neoprene cover gasket provides a watertight seal to meet UL Type 4 (NEMA 4) requirements
- Stainless steel hinges are corrosion resistant while providing safe and easy access to interior of enclosure
- Waterguard™ desiccant packet absorbs and removes water/moisture and protects the enclosed equipment when not energized
- Adjustable mounting feet provide ease of mounting during installation

### Certifications & Compliances:

- Class I, Divisions 1 & 2, Groups B, C, D
- Class I, Zone 1&2 IIB + H<sub>2</sub>
- Class II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- UL/cUL Listed
- IP 65
- NEMA 3, 4X, 7BCD, 9FG, 12

### Standard Materials:

- Enclosure: Copper-free aluminum with interior and exterior epoxy powder coat
- Clamp: Stainless steel
- Clamp Grips: Polyvinylchloride dipped
- Gasket: Neoprene

### Electrical Rating Ranges:

- 120-volt AC supply
- Control relay interlocking contact: 15A at 277VAC; 10A at 600VAC
- Dual-tapped 240 and 480 VAC Step Down Transformer available
- Provides 2k ohms or less switching impedance



### Ordering Information:

**Description**  
Indicator with two pilot lights\*

**Catalog Number**  
EGL210 J1 J3

\*Includes one red and one green pilot light.

### Options:

| Description                                                         | Suffix |
|---------------------------------------------------------------------|--------|
| Internal space heaters to limit condensation build-up               | R11    |
| Transformer suitable for both 220/240VAC or 440/480VAC applications | S883   |
| 50 foot cord                                                        | 50FC   |

### Options:

#### Replacement Parts:

Ground clamp  
Ground clamp assembly (includes 25 ft. cord, connector and clamp)  
EGL210 universal interior replacement kit  
Pilot lights (Red)  
Pilot lights (Green)  
Mounting feet  
Transformer (220/240VAC; 440/480VAC)  
Space heater  
Pilot light plug kit

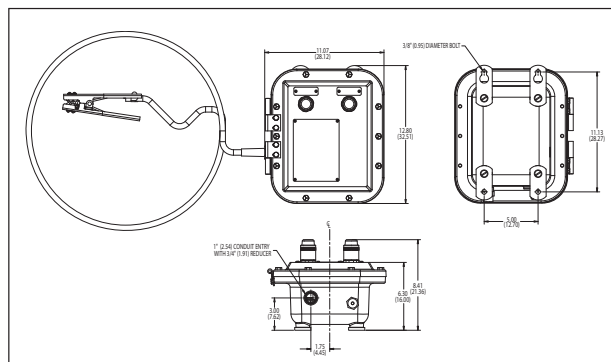
EGL-K1  
EGL:20109-B  
EGL210-R1  
EMP009-J1-LED  
EMP009-J3-LED  
EJB-KIT5  
EGL S883 KIT  
EGL R11 KIT  
EGL PLUG KIT

### Weight & Dimensions:

**EGL Assembly:**

**Weight = 32 lbs (14.5 kg)**

**Dimensions = inches (centimeters)**



**Crouse-Hinds**

by **E.T.N**

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# AFU and AFUX Conveyor Belt Control Switch

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

## Applications:

AFU and AFUX conveyor control switches are used:

- As emergency or normal "STOP" switch for conveyor lines, cranes, unloaders, bulk handling systems and similar equipment
- In steel mills, mining and ore and coal handling operations, automotive and other assembly lines, warehouses, loading docks and various process industry facilities
- In the control circuit of magnetic motor starters to shut down motor-driven conveyors or other machinery when switch is actuated

AFU series complies with requirements for use in Class II areas having combustible dusts that may or may not be electrically conductive.

AFU series are also gasketed for use in hosedown areas even when combustible dusts are present.

AFUX series complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFUX series also complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFUX series also complies with NEC requirements for use in Class II hazardous areas, or for use in NEC hazardous areas classified simultaneously as Class I and Class II.

## Features:

- Furnished with one or two end units, each containing 2-NO and 2-NC contact arrangements.
- Precision switches provide maintained contact (switches have a snap action mechanism).
- Enclosure has three 1" conduit hubs – two for horizontal through feed and one at the bottom. Cast mounting lugs on 1½" centers permit attachment to the web of a standard 3" angle iron.
- In installation, the actuating line or cable is connected from a fixed point to the loop on the end unit. A pull on the line of the required operating force and with a total movement of ½" actuates the plunger, opens the switch and trips the red painted indicating arm forward, which locks the plunger in the actuated (switch open) position. Returning the indicating arm to its normal position resets the mechanism. A typical installation would include single end switch units at each end of the conveyor with double end switch units between.
- Depending on the size and length of line, supports at properly spaced intervals may be necessary to ensure that the line or cable weight alone will not actuate switch.

## Certifications and Compliances:

### AFU Series

- NEC/CEC:
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- Encl. 3, 5
- NEMA: 3, 4, 9EFG
- IP66
- UL Standard: 698
- CSA Standard: 22.2 No. 30

### AFUX Series

- NEC:
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 7CD, 9EFG
- IP65
- UL Standard: 698
- cUL

## Standard Materials:

- Enclosure – *Feraloy*® iron alloy
- Plunger – stainless steel
- Loop – bronze
- Indicating arm – steel

## Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized with chromate finish (red acrylic paint on indicating arm)
- Bronze – natural

## Options:

### Description

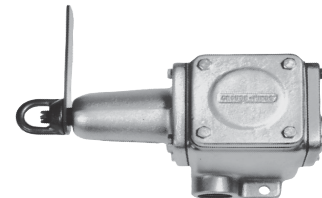
Finish: *Corro-free*™ epoxy powder coat – for coating outside only.

### Suffix

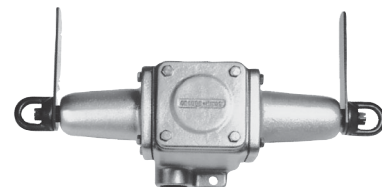
**S752**

## Electrical Rating:

- Control circuit switch – 15 AMP, 600 VAC max.



AFU0333-50 Single end left



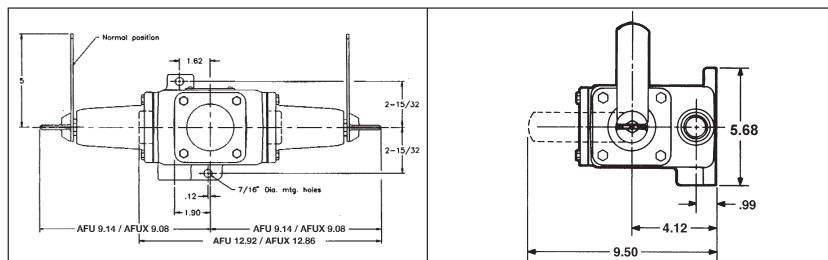
AFU0333-66 Double end

## Ordering Information

| Description      | Maximum Weight of Unsupported Line or Cable Without Actuating Switch† (lbs.) | Total Operating Force Required (lbs.) | Contact Arrangements With 2-NO, 2-NC in Each End Unit |             |
|------------------|------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------|-------------|
|                  |                                                                              |                                       | Cat. #                                                | Cat. #      |
| Single end left  | 15                                                                           | 25                                    | AFU0333 50                                            | AFUX0333 50 |
| Single end left  | 25                                                                           | 50                                    | AFU0333 60                                            | AFUX0333 60 |
| Single end right | 15                                                                           | 25                                    | AFU0333 05                                            | AFUX0333 05 |
| Single end right | 25                                                                           | 50                                    | AFU0333 06                                            | AFUX0333 06 |
| Double end       | 15                                                                           | 25                                    | AFU0333 55                                            | AFUX0333 55 |
| Double end       | 25                                                                           | 50                                    | AFU0333 66                                            | AFUX0333 66 |

†A galvanized steel aircraft cable, supported every 10' is recommended.

## Dimensions In Inches\*:



\*Dimensions are approximate, not for construction purposes.

**Crouse-Hinds**  
by **F.T.N**

# AFA and AFAx Conveyor Belt Alignment Switch

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

5C

## Applications:

AFA, AFAx conveyor belt alignment switches are used:

- As emergency or normal "STOP" switch for conveyor belts whenever they become misaligned or run off their tracks due to excessive speed, uneven load, leveling, breakage and/or other problems.
- In steel mills, mining and ore and coal handling operations, automotive and other assembly lines, warehouses, loading docks, grain loading and handling facilities, and various other bulk handling operations.
- In the control circuit of magnetic motor starters to shut down motor-driven conveyors in case of abnormal belt misalignment or run-off.

AFA series complies with requirements for use in Class II areas having combustible dusts that may or may not be electrically conductive.

AFA series are also gasketed for use in hosedown areas even when combustible dusts are present.

AFAx series complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFAx series also complies with NEC requirements for use in Class II hazardous areas, or for use in NEC hazardous areas classified simultaneously as Class I and Class II.

## Features:

- Furnished with precision switches that provide normally open and normally closed contacts (switches have a snap action mechanism).
- Housing consists of a center section which can be mounted either vertically or horizontally, and a switch housing with an attached switch operating arm.
- Enclosure has three 1" conduit hubs. Cast mounting lugs on 1½" center permit attachment to the web of a standard 3" angle iron.
- Operating arm has 3½" long stainless steel protective roller. Approximately ¾" lateral movement of operating arm actuates switch.
- Spring loaded operating arm will automatically return switch to normal position when belt interference is removed.
- A severe conveyor belt run-off can rotate the operating arm counter-clockwise up to 85 degrees without damage to the switch mechanism.
- Installation of AFA or AFAx unit on either side of a conveyor belt allows approximately 1" or a predetermined allowable belt misalignment before switch is actuated. A typical installation would include a pair of AFA or AFAx units at each end of the conveyor belt where belt returns.

## Certifications and Complies:

### AFA SERIES

- NEC/CEC:  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA: 3, 4, 9EFG
- IP66
- UL Standard: 698
- CSA C22.2 No. 25

### AFAx SERIES

- NEC:  
Class I, Division 1 & 2, Groups C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA: 3, 7CD, 9EFG
- IP65
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

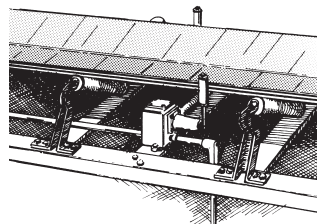
## Standard Materials:

- Enclosure – *Feraloy*® iron alloy
- Bearing and operating arm – stainless steel with plastic end caps

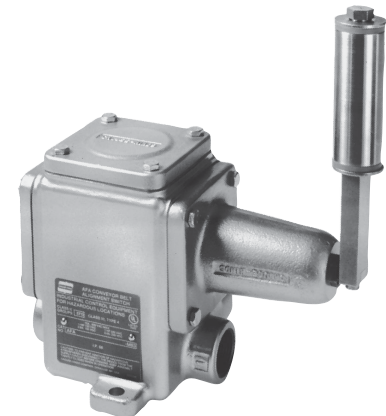
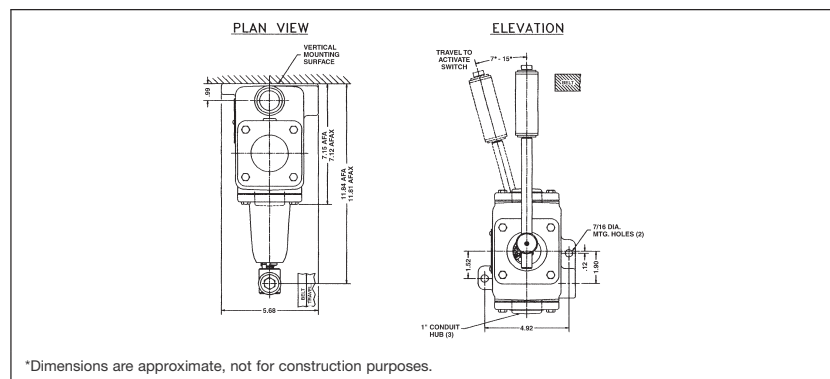
## Standard Finishes:

- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Stainless steel – natural

## Typical AFA Switch Application



## Dimensions In Inches\*:



## Electrical Rating:

- Control circuit switches – 15 AMP, 600 VAC max.

## Ordering Information

| Contact Arrangement | Diagram | Cat. # |
|---------------------|---------|--------|
| 2 normally open     |         | AFA20  |
| 2 normally closed   |         | AFAx20 |

## Options:

| Description                                                               | Suffix |
|---------------------------------------------------------------------------|--------|
| Finish: <i>Corro-free</i> ™ epoxy powder coat – for coating outside only. | S752   |

600 VAC

**Applications:**

AFU mine signal switches are used:

- For signalling circuits or remote control of magnetic motor starters
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

**Features:**

- Sturdy raintight enclosure with heavy mounting lugs
- Wires enter enclosure through clearance holes in the underside
- Switches are actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Units are furnished with heavy duty motor control push buttons. Several of these may be interconnected electrically for remote control of a magnetic motor starter from more than one location

**Certifications and Compliances:**

- NEMA: 3

**Standard Materials:**

- Enclosure – *Feraloy*® iron alloy
- Plunger – steel
- Loop – bronze

**Standard Finishes:**

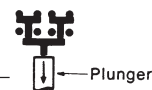
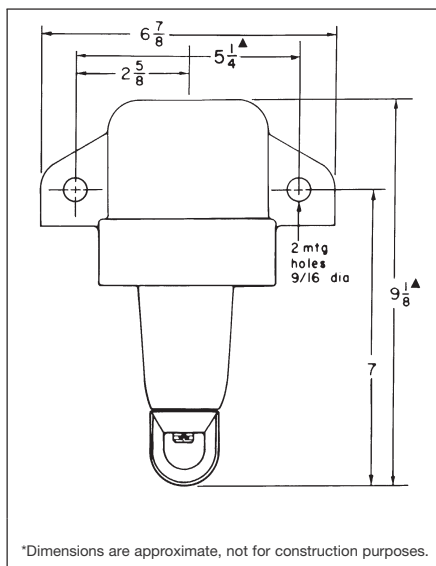
- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural



AFU mine signal switch with pushbutton switch (cover removed)

**Ordering Information**

| Maximum Wt. of Line or Cable Without Actuating Switch (lbs.) | Total Operating Force Required (lbs.) | With Pushbutton Heavy Duty 600 VAC Max. Cat. # |
|--------------------------------------------------------------|---------------------------------------|------------------------------------------------|
| 25                                                           | 50                                    | AFU254                                         |
| 15                                                           | 25                                    | AFU154                                         |

**Dimensions In Inches\*:**

# FLEXITITE™ D2X Series Attachable Pendant Pushbutton Stations

For Class I, Div. 2 Areas

NEMA 3, 4X, 5, 6, 7BCD (Div. 2), 9FG (Div. 2), 12  
Watertight  
Raintight  
Dust-tight  
Wet Locations

5C

## Applications:

FLEXITITE attachable pendant pushbutton stations are used:

- For safe multi-function motor circuit control of:
  - Hoists
  - Cranes
  - Machine Tools
  - Electromagnets
- In hazardous areas such as Class I, Division 2, Groups B, C and D (classified) areas or Class II, Division 2, Groups F and G, as defined by the National Electrical Code
- Where wash downs are necessary – in damp, wet, dirty or corrosive locations
- For control applications requiring 2 to 8 functions

## Features:

- Safety cushioned – neoprene encapsulation protects internal switches and connectors from impact damage and provides extra protection for personnel.
- Stress relief for your cable is built-in. A separate cable grip is not needed.
- Uses Eaton's Crouse-Hinds ESWP factory sealed contacts suitable for use in Class I, Division 2, Groups B, C, and D.
- Switches are rated for 10 amps 600 VAC (NEMA A600).
- Indicator plates meet OSHA requirements for clear identification of functions. A full set of plates is included with each station.
- Jam-resistant operator buttons are raised flexible diaphragms – an integral part of the molded one-piece cover.
- Compact design.
- Safety yellow finish.

## Certifications and Compliances:

- NEMA: 3, 4X, 5, 6, 7BCD (Div. 2), 9FG (Div. 2), 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Body and cover – steel reinforced neoprene
- Strain relief and reinforcement plates – stainless steel
- Exterior hardware – stainless steel

## Standard Finishes:

- Neoprene – safety yellow
- Stainless steel – natural



8-Button Control Station

5C

# FLEXITITE™ D2X Series

## Attachable Pendant Pushbutton Stations

### For Class I, Div. 2 Areas

NEMA 3, 4X, 5, 6, 7BCD (Div. 2), 9FG (Div. 2), 12  
 Watertight  
 Raintight  
 Dust-tight  
 Wet Locations

### Ordering Information

#### Pendant Pushbutton Stations

| Description | Cable Dia. | Cat. #      |
|-------------|------------|-------------|
| 2-Button    | .31 – .75  | D2X8635 210 |
| 4-Button    | .50 – .75  | D2X8635410  |
| 6-Button    | .59 – .81  | D2X8635 610 |
| 8-Button    | .59 – .92  | D2X8635 810 |

#### Replacement Indicator Plates

(A full set is included with each control station)

##### 2-Button

| Cat. #   | Description | Cat. #   | Description |
|----------|-------------|----------|-------------|
| 315116 1 | Down/West   | 315116 7 | Rev/Left    |
| 315116 2 | Start/North | 315116 8 | Up/East     |
| 315116 3 | Stop/South  |          |             |
| 315116 4 | Off/In      |          |             |
| 315116 5 | On/Out      |          |             |
| 315116 6 | Fwd/Right   |          |             |

##### 4, 6 and 8-Button

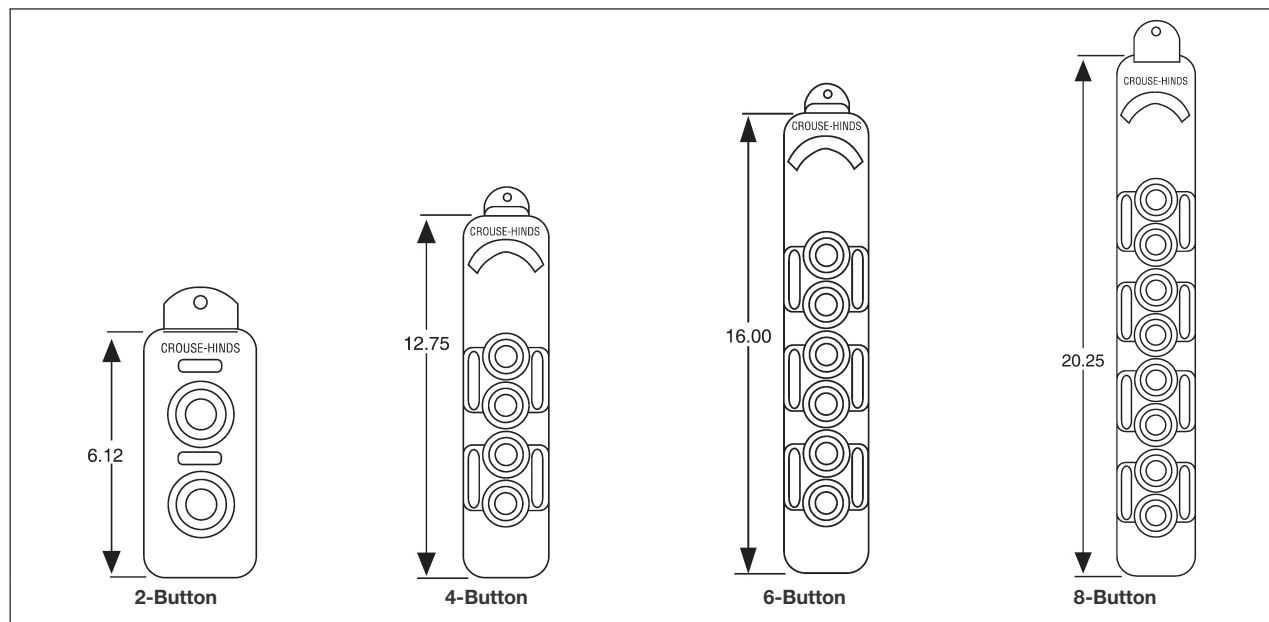
| Cat. #   | Description | Cat. #   | Description |
|----------|-------------|----------|-------------|
| 314850 1 | Bridge      | 314850 6 | Fwd/Rev     |
| 314850 2 | Trolley     | 314850 9 | North/South |
| 314850 3 | Hoist       |          | On/Off      |
| 314850 4 | In/Out      |          | Start/Stop  |
| 314850 5 | Up/Down     |          |             |
|          | Right/Left  |          |             |
|          | East/West   |          |             |

#### Replacement Switch

| Description        | Cat. #  |
|--------------------|---------|
| Replacement Switch | ESWP126 |

### Dimensions

In Inches:





# FLEXITITE™ Attachable Pendant Pushbutton Stations

NEMA 3, 4X, 5, 6, 12

Raintight  
Watertight  
Dust-tight  
Wet Locations

5C

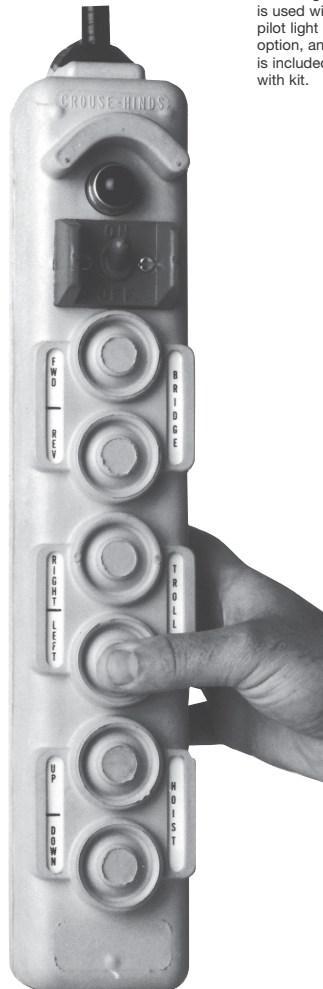
## Applications:

FLEXITITE attachable pendant pushbutton stations are used:

- For safe, multi-function motor circuit control of:
  - Hoists
  - Cranes
  - Machine Tools
  - Electromagnets
- Non-hazardous control environments requiring from 2 to 8 functions.
- Where washdowns are necessary – in damp, wet, dirty, or corrosive locations.

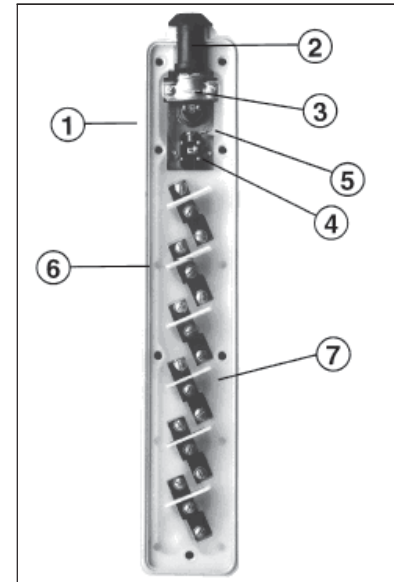
## Features:

- Safety insulated to meet OSHA requirements for enclosing live parts. The entire unit except the strain relief is insulated with neoprene.
- Safety cushioned – neoprene encapsulation protects internal switches and connectors from impact damage and provides extra protection for personnel.
- Stress relief for your cable is built-in. A separate cable grip is not needed unless the optional pilot light kit is used.
- Positive action long life momentary contact switches.
- Maintained Off-On toggle switch is optionally available on 4, 6, and 8 button units.
- Jam resistant operator buttons are raised flexible diaphragms – an integral part of the molded one-piece cover.
- Compact – 3" x 3" enclosure easily fits your hand.
- Indicator plates meet OSHA requirements for clear identification of functions. A full set of plates is provided with each station.



A cable grip is used with pilot light option, and is included with kit.

## Inside Front View



1. BODY SEAL – Compresses against mating half to form a positive seal.
  2. REDUCING GROMMETS – Permit use of five different cable sizes while sealing cable entrance.
  3. CABLE CLAMP – Secures conductors inside switch. Transfers strain to inner steel core of switch. (Not used with pilot light.)
  4. TOGGLE SWITCH (OPTIONAL) – Maintained off-on switch to control power to pendant stations.
  5. GREEN GROUNDING SCREW – Makes positive contact between inner steel core and ground wire.
  6. INSULATION BARRIERS – On 4- and 6-button models. Position switches and separate N.O. and N.C. switch contacts for added safety.
  7. SEPARATOR – For 4- and 6-button models. Tough polypropylene sheet retains switches and forms an insulated wiring channel.
- STRAIN RELIEF – Integral part of the inner steel core – provides tie-off point for strain chain to relieve tension from electrical cable.
- ELECTRICAL INTERLOCK – Schematic furnished to wire switches against opposed operations.
- LOW COST, EASILY INSTALLED – Despite their many advantages, Eaton's Crouse-Hinds pendant stations generally cost less than similar metal units.
- RAISED BUMPER – protects lens against damage caused by impact.

## Certifications and Compliances:

- NEMA: 3, 4X, 5, 6, 12
- UL Standard: 508
- CSA Approved

## Standard Materials:

- Body and cover – steel reinforced neoprene
- Strain relief and reinforcement plates – stainless steel
- Exterior hardware – stainless steel

## Standard Finishes:

- Neoprene – safety yellow
- Steel – stainless steel

**Crouse-Hinds**  
by **E.T.N**



5C

# FLEXITITE™ Attachable Pendant Pushbutton Stations

NEMA 3, 4X, 5, 6, 12

Raintight  
Watertight  
Dust-tight  
Wet Locations

## Ordering Information - One and Two Speed 2, 4, 6 and 8 Buttons

| Style                                                                             | Switch* | 1 Speed<br>20A 460V<br>2 hp. 230V | 2 Speed<br>10A 230V<br>½ hp. 230V | DC<br>10A 125V<br>⅓ hp. 125V | Cable<br>Diameter | Shipping<br>Weight<br>(lbs.) | Dimensions |       |       |
|-----------------------------------------------------------------------------------|---------|-----------------------------------|-----------------------------------|------------------------------|-------------------|------------------------------|------------|-------|-------|
|                                                                                   |         |                                   |                                   |                              |                   |                              | Length     | Width | Depth |
| <b>2-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | None    | X8635 21                          | X8635 22                          | X8635 20                     | .555 thru .665    | 2½                           | 8¾"        | 2¼"   | 3"    |
| <b>4-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | 3316317 | X8635 41B                         | X8635 42B                         | X8635 40B                    | .505 thru .730    | 3                            | 13½"       | 3"    | 3⅝"   |
| <b>6-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | 3316317 | X8635 61B                         | X8635 62B                         | X8635 60B                    | .590 thru .840    | 6½                           | 17"        | 3"    | 3⅝"   |
| <b>8-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | 3316317 | X8635 81                          | X8635 82\$                        | X8635 80                     | .698 thru .968    | 9                            | 21½"       | 3"    | 3⅞"   |

\*Should be ordered separately.

\$2 speed includes: 6, 2-speed switches and 2, single speed switches.

## Pilot Light Kit for 4, 6 and 8-Button Only

| Lamp Voltage | Cable Diameter |           |           | 8 Button |  |
|--------------|----------------|-----------|-----------|----------|--|
|              | 4 and 6 Button |           |           |          |  |
| 110-125V AC  | 3316533        | 3316533 1 | 3316533 2 | 3316624  |  |
| 210-250V AC  | 3316534        | 3316534 1 | 3316534 2 | 3316625  |  |

Pilot light kit includes: lamp assembly with lens and bulb, cable support grip, and "S" hook.  
Support grip and "S" hook not required on 8-button. NEMA 3,4,5,12 only.

## FLEXITITE™ 2-Button Attachable Pendant Switch

| Cat. #  | Contact Style    | Voltage | Amps Make | Amps Break |
|---------|------------------|---------|-----------|------------|
| X8995 1 | Momentary Switch | 240 AC  | 7.5       | 0.75       |
| Yellow  |                  | 120 AC  | 15.0      | 1.5        |
|         |                  | 24 AC   | 15.0      | 2.5        |
|         |                  | 250 VDC | 0.27      | 0.27       |
|         |                  | 125 VDC | .055      | 0.55       |



## Indicator Plates (Replacement only – units come with plates standard)

| 2-Button |             |           |             | 4, 6 and 8-Button |                        |           |                        |
|----------|-------------|-----------|-------------|-------------------|------------------------|-----------|------------------------|
| Cat. #   | Description | Cat. #    | Description | Cat. #            | Description            | Cat. #    | Description            |
| 315116 1 | Down/West   | 315116 7  | Rev/Left    | 314850 1          | Bridge                 | 314850 6  | Fwd/Rev. (North/South) |
| 315116 2 | Start/North | 315116 8  | Up/East     | 314850 2          | Trolley                | 314850 9  | On/Off (Start/Stop)    |
| 315116 3 | Stop/South  | 315116 9  | Raise/Lower | 314850 3          | Hoist                  | 314850 12 | Raise/Lower            |
| 315116 4 | Off/In      | 315116 10 | Up/Down     | 314850 4          | In/Out (Up/Down)       | 314850 13 | Inbd/Outbd             |
| 315116 5 | On/Out      | 315116 11 | Right/Left  | 314850 5          | Right/Left (East/West) | 314850 14 | Off/On                 |
| 315116 6 | Fwd/Right   |           |             |                   |                        |           |                        |

Shoulder Bolts for Fastening Front to Back Cover – 2-Button (P/N 1316311-2); 4- &amp; 6-Button (P/N 1316311-1); 8 button (P/N 1316311-3).

NOTE: Refer to price list for identification of stock items.

## Replacement Parts

| Style    | Cat. #      |            | Switch Element Part Numbers |                             |                              |                         |                       |                    |                  | Parts Kit‡ | Pilot Light Kit |                 |
|----------|-------------|------------|-----------------------------|-----------------------------|------------------------------|-------------------------|-----------------------|--------------------|------------------|------------|-----------------|-----------------|
|          | Front Cover | Back Cover | Toggle Switch Kit†          | 1 Speed 20A, 460V 2hp, 230V | 2 speed 10A, 230V ½ hp. 230V | DC 10A, 125V ⅓ hp. 125V | Toggle Off/On Element | Barrier            | Separator        |            |                 |                 |
| 2-Button | A335578     | A335577    | 1 Not Avail.                | 3316480                     | 314896                       | 314903                  |                       |                    |                  |            | RX8635 21       | See Above Chart |
| 4-Button | 3335848     | 1 3335829  | 1 3316317                   | 3316480                     | 314896                       | 314903                  | 1316313               | 314849 1 (4 Req'd) | 335616 (1 Req'd) | RX8635 41  |                 |                 |
| 6-Button | 3335845     | 1 3335830  | 1 3316317                   | 3316480                     | 314896                       | 314903                  | 1316313               | 314849 1 (6 Req'd) | 335571 (1 Req'd) | RX8635 61  |                 |                 |
| 8-Button | 3344153     | 3344154    | 3316317                     | 3316480                     | 314896                       | 314903                  | 1316313               | Not Req'd          | Not Req'd        | RX8635 80  |                 |                 |

†Toggle switch kit – includes: toggle switch, guard, assembly and screws.

‡Parts kit – includes cable grommets, legend plates and assembly screws.

# EGF Series Ground Fault Control Station

Cl. I, Div. 1 & 2, Groups C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7CD, 9EFG, 12

**5C**

## Applications:

EGF Series of control stations are used:

- For the additional safety of personnel, and for equipment protection in remote areas.

## Features:

- Copper-free aluminum construction offers lightweight, corrosion resistance and a long, maintenance-free service life.
- 1 1/4" throughfeed conduit hubs with 1 1/4"-1" reducers for ease of installation.
- Compact, internally flanged enclosure requires minimum installation area.
- Steel mounting feet with electroplate finish for fast, secure, and corrosion-resistant mounting.
- Accepts #14-#10 copper wire sizes for application flexibility.
- Push-to-test button and pilot light (with 10,000 hour incandescent lamp) for easy and constant operational monitoring of unit.
- Cast aluminum circuit breaker operating handle for durability during use.
- EPD breakers for protection of heat tracing circuits.

## Certifications and Compliances:

- NEC:  
Class I, Div. 1 & 2, Groups C, D  
Class II, Div. 1, Groups E, F, G  
Class II, Div. 2, Groups F, G  
Class III
- NEMA 3, 7CD, 9EFG, 12

## Standard Materials:

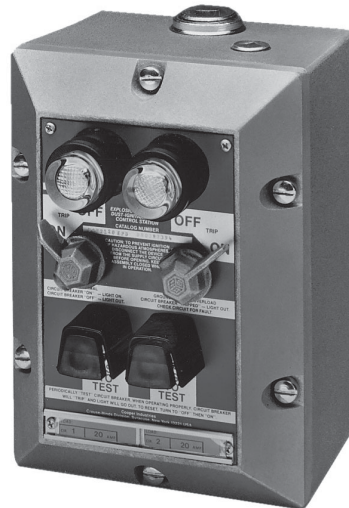
- Bodies, covers, threaded barrels, guards, collars, and toggle operator – copper-free aluminum
- Pushbuttons – type 6 / 6 nylon
- Operating shafts – stainless steel

## Standard Finishes:

- Copper-free aluminum – natural
- Sheet steel – zinc electroplate with chromate finish
- Stainless steel – natural

## Electrical Rating:

- GFI, EPD breakers – 120 VAC (single pole), 120 / 240 VAC for two pole (10,000 AIC)



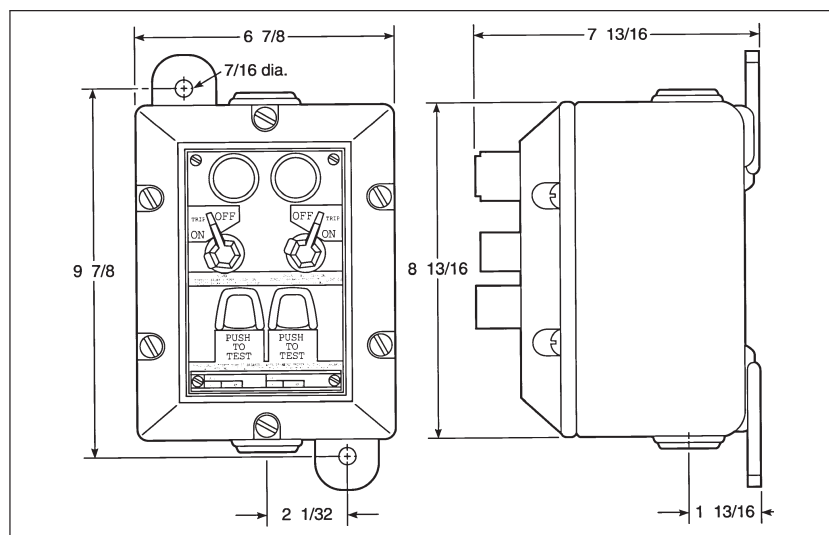
## Ordering Information

| Number of Breakers | Number of Poles | Milliamp Trip | Cat. #     |
|--------------------|-----------------|---------------|------------|
| 1                  | 1               | 5             | EGF11 ①    |
| 1                  | 2               | 5             | EGF12 ①    |
| 2                  | 1               | 5             | EGF21 ①    |
| 1                  | 1               | 30            | EGF11EPD ① |
| 1                  | 2               | 30            | EGF12EPD ① |
| 2                  | 1               | 30            | EGF21EPD ① |

①Add 15, 20, 25, or 30 amp breaker rating.

## Dimensions

In Inches:



# 5C

## DSD-TS Series Timers

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III

For use with Eaton's Crouse-Hinds EDS/EDSC back boxes (single and two-gang) and EDSCM modular control device bodies (up to nine-gang maximum). These bodies are to be ordered separately from the DSD-TS covers.

### Applications:

- Provides automatic shut-off for fans, heaters, pumps, lights, and other energy consuming loads in Class I and Class II hazardous areas

### Features:

- Spring wound, mechanical timer switch
- Copper-free aluminum covers

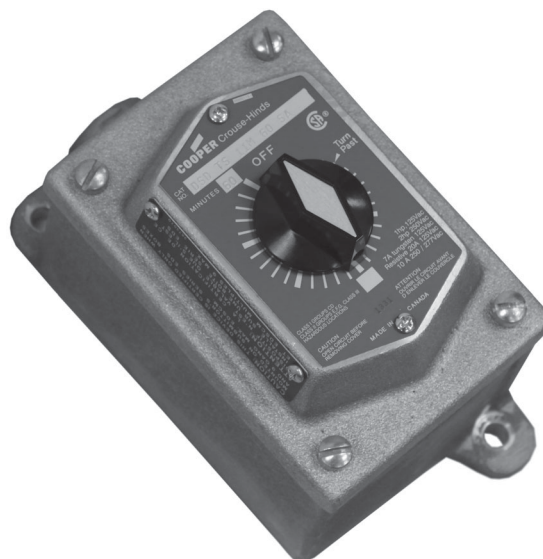
### Certifications and Compliances:

- CSA certified per file LR5169
- Class I, Divisions 1 & 2, Groups C, D
- Class II, Divisions 1 & 2, Groups E, F, G
- Class III

**NOTE:** Suitable for use in Zone 1 and Zone 2 classified areas (gas groups IIB and IIA) as per Canadian Electrical Code, Part I, Section 18-100(a).

### Electrical Ratings:

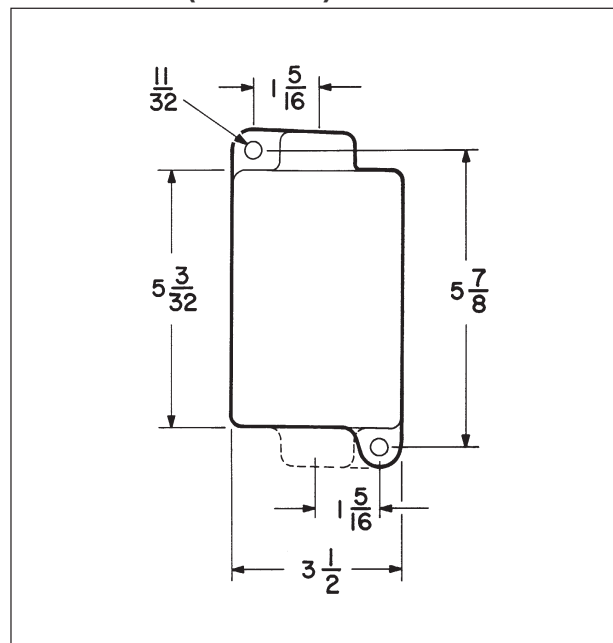
- 1 HP, 125 VAC max.
- 2 HP, 250 VAC max.
- 7A Tungsten, 125 VAC max.
- 20A resistive 125 VAC max.
- 10A resistive 250 VAC max.
- 10A resistive 277 VAC max.



### Catalog Numbering Example:

|                   |        |    |   |    |    |
|-------------------|--------|----|---|----|----|
|                   | DSD TS | 11 | M | 15 | SA |
| Series:           |        |    |   |    |    |
| DSD-TS            |        |    |   |    |    |
| Poles:            |        |    |   |    |    |
| 11 - SPST         |        |    |   |    |    |
| 12 - SPDT         |        |    |   |    |    |
| 21 - DPST         |        |    |   |    |    |
| Minutes or Hours: |        |    |   |    |    |
| M - Minutes       |        |    |   |    |    |
| H - Hours         |        |    |   |    |    |
| Time:             |        |    |   |    |    |
| Minutes:          |        |    |   |    |    |
| 5 - 5 Minutes     |        |    |   |    |    |
| 15 - 15 Minutes   |        |    |   |    |    |
| 30 - 30 Minutes   |        |    |   |    |    |
| 60 - 60 Minutes   |        |    |   |    |    |
| Hours:            |        |    |   |    |    |
| 2 - 2 Hours       |        |    |   |    |    |
| 4 - 4 Hours       |        |    |   |    |    |
| 6 - 6 Hours       |        |    |   |    |    |
| 12 - 12 Hours     |        |    |   |    |    |
| Material:         |        |    |   |    |    |
| SA - Aluminum     |        |    |   |    |    |

### Dimensions (in Inches):



**Note:** Depth is 5.5" from front of switch to back of box.

| Description                                   | Page No.          |
|-----------------------------------------------|-------------------|
| Explosionproof VFDs - Class I, Division 1 & 2 |                   |
| ACE10 Series                                  | see pages 599–603 |
| ACE20 Series                                  | see pages 605–609 |





# ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet locations

6C

## The only explosionproof VFD solution utilizing a NEMA 7 classified enclosure

Eaton's Crouse-Hinds Explosionproof VFDs are highly flexible AC drives designed specifically for hazardous area locations. These drives can be mounted next to the motor in the classified area, providing significant installation cost savings - along with the traditional VFD benefits of energy savings, speed and torque control, and system diagnostics.

This Eaton's Crouse-Hinds innovative product features the first ever NEMA 7 enclosure with active cooling, allowing the solution to be rated Class I, Divisions 1 and 2. It is designed to match the high requirements of pumps, compressors, fans, separators, and mixers in the following process industries:

- Oil and gas/refineries
- OEM skid builders
- Petrochemical
- Water/waste water
- Pharmaceutical
- Food and beverage manufacturing

### Applications:

- For speed control of pumps, compressors, fans, conveyors, separators, mixers, and other process equipment
- Designed to meet the high reliability and safety requirements of process industries such as oil and gas, chemical and mining

### ACE Series System Benefits:

#### Simple, Cost-Effective Installations

- ACE Explosionproof VFDs are installed 'on-machine' inside the hazardous areas, eliminating expensive, complicated installations
- There is no need to run long lines of conduit and motor cable, dig up roadways and sidewalks, navigate around obstacles and hazards or build off-site control rooms in non-hazardous areas to house VFD clusters
- Reflected Wave Syndrome is eliminated due to short motor cable runs

### Additional VFD Benefits:

#### Reduce Energy Costs Through Improved Process Control

- Fine speed and torque control optimizes system performance and reduces energy consumption

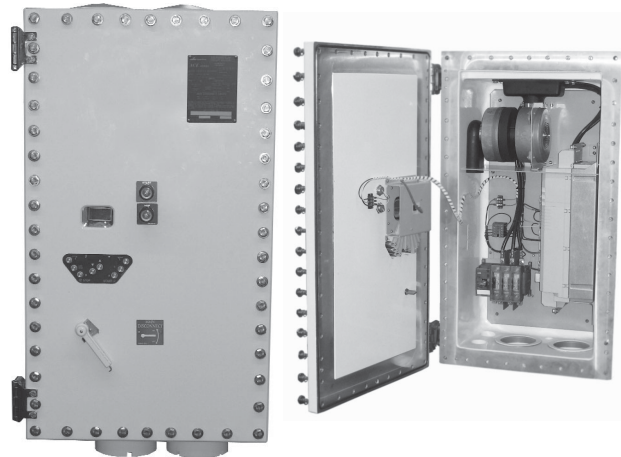
#### Reduce Operation and Installation Costs

- Reduce stress on electrical system
- Reduce water hammer effects with soft start capability
- Lower speed/load on bearings and seals
- Reduce risk of system damage due to cavitation

#### Avoid Downtime with Real-Time Equipment and Process Data

- Diagnostics help locate disturbances to the system and suggest remedies, allowing proactive maintenance decisions to be made

\*5HP and below listed for Group B.



6C

### Certifications and Compliances:

- UL Classified  
Class I, Divisions 1 and 2, Groups B, C, D
- cUL Classified  
Class I, Divisions 1 and 2, Groups B\*, C, D
- Standards  
UL 1203
- Environmental Ratings  
NEMA 3, 4X, 7BCD  
Raintight  
Wet locations
- Operating Temperature Range  
-10°C to 50°C (14°F to 122°F)

### Standard Materials and Finishes:

- Body and Cover – Copper-free aluminum, epoxy powder coated
- Operating Handle – Copper-free aluminum, epoxy painted
- Keypad – Stainless steel, natural
- Window – Tempered soda lime glass
- Blower – Aluminum, natural
- Filters – Stainless steel, natural
- Pre-filters – Stainless steel, natural
- Disconnect – Stainless steel, natural
- Shroud – Copper-free aluminum, epoxy painted
- Cover Hinges, Bolts, Washers and Springs – Stainless steel, natural
- Internal Brackets – Stainless steel, natural
- Manifold and Intake – EDPM rubber, natural

### Horsepower Ratings:

- Available up to 60HP
- Higher horsepower ratings coming soon

### VFD System Specifications:

- ABB ACS850 Series low voltage, compact AC drives

## Crouse-Hinds

by **Eaton**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

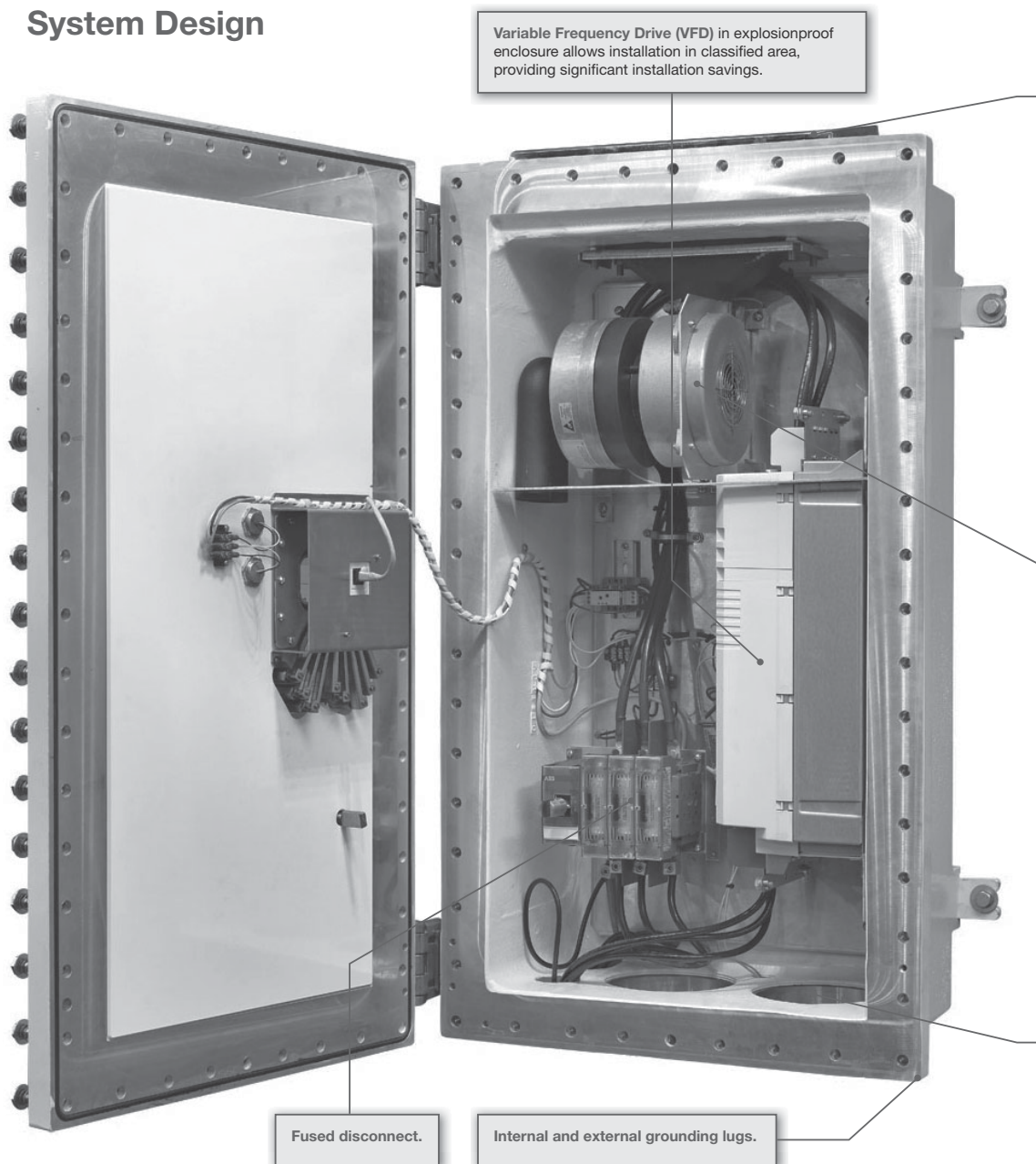
6C

## ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

### System Design



\*5HP and below listed for Group B.



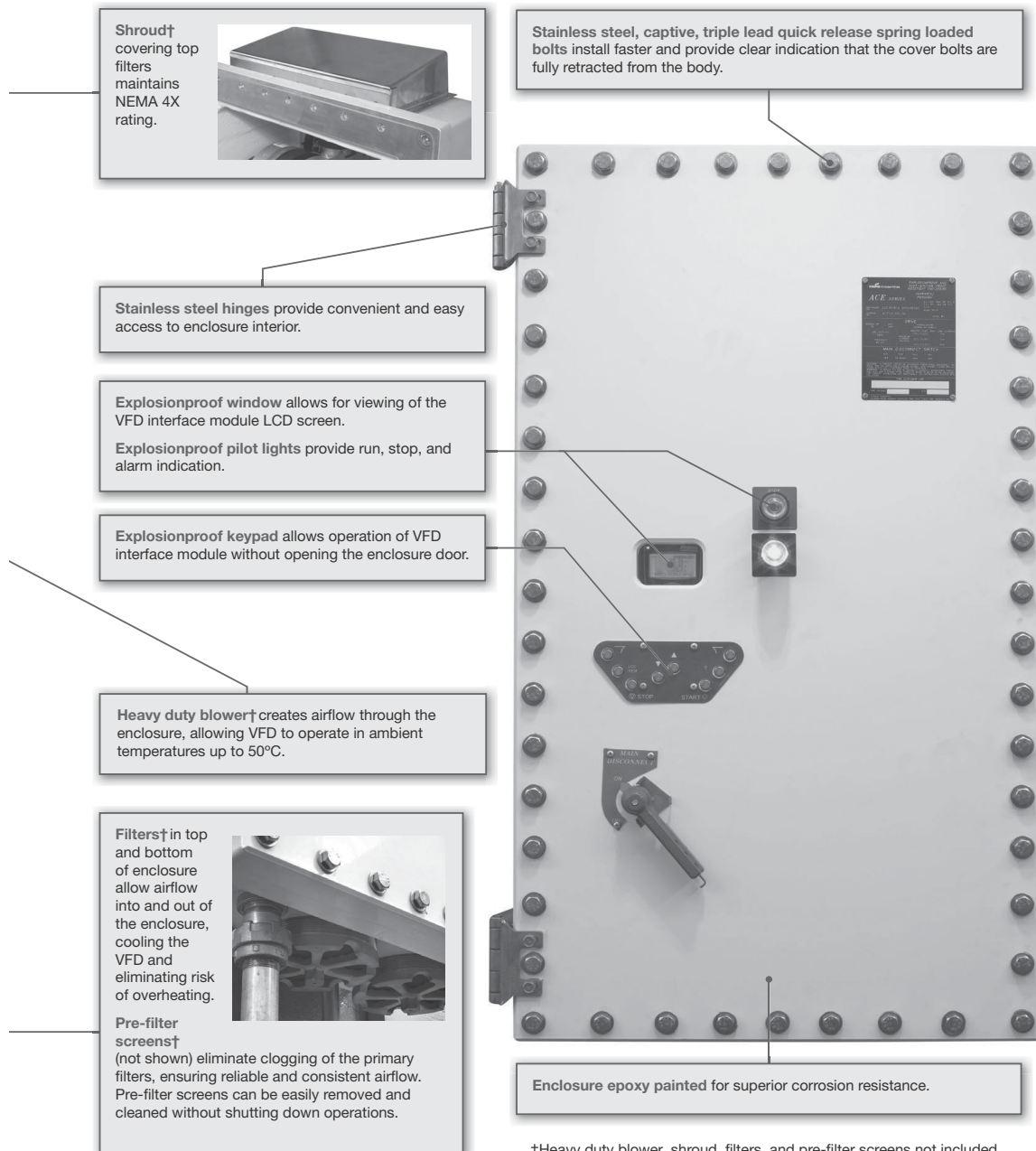
# ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet Locations

6C



†Heavy duty blower, shroud, filters, and pre-filter screens not included with units containing 1.5 to 5.0 horsepower VFDs.

\*5HP and below listed for Group B.

**Crouse-Hinds**  
by **Eaton**

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# 6C ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet Locations

## Ordering Information:

### Step 1 – Select VFD Horsepower Rating

| Cat. #   | Nominal Horsepower (KW) | Max. Disconnect Rating (Amps) | Disconnect Fuse Type | Enclosure Size | Input Rating (Amps) | Max. Output Rating (Amps)† | Power Loss (Watts)‡ | Temp. Rating |
|----------|-------------------------|-------------------------------|----------------------|----------------|---------------------|----------------------------|---------------------|--------------|
| ACE10 1  | 1.5 (1.1)               | 30                            | J                    | 1              | 2.3                 | 3.0                        | 106                 | T6           |
| ACE10 2  | 2.0 (1.5)               |                               | J                    | 1              | 3.1                 | 3.6                        | 112                 | T6           |
| ACE10 3  | 3.0 (2.2)               |                               | J                    | 1              | 4.0                 | 4.8                        | 132                 | T6           |
| ACE10 5  | 5.0 (3.0)               |                               | J                    | 1              | 6.6                 | 8.0                        | 178                 | T6           |
| ACE10 7  | 7.5 (5.5)               |                               | J                    | 1              | 12.0                | 12.2                       | 606                 | T4A          |
| ACE10 10 | 10.0 (7.5)              |                               | J                    | 1              | 16.0                | 15.6                       | 674                 | T4A          |
| ACE10 15 | 15.0 (11.0)             | 60                            | J                    | 2              | 20.0                | 23.0                       | 737                 | T4A          |
| ACE10 20 | 20.0 (15.0)             |                               | J                    | 2              | 26.0                | 30.0                       | 737                 | T4A          |
| ACE10 25 | 25.0 (18.5)             |                               | J                    | 2              | 30.0                | 35.0                       | 847                 | T4A          |
| ACE10 30 | 30.0 (22.0)             |                               | J                    | 2              | 36.0                | 44.0                       | 903                 | T4A          |
| ACE10 40 | 40.0 (30.0)             | 100                           | J                    | 2              | 55.0                | 58.0                       | 1217                | T4A          |
| ACE10 50 | 50.0 (37.0)             |                               | J                    | 2              | 65.0                | 72.0                       | 1397                | T4A          |
| ACE10 60 | 60.0 (45.0)             |                               | J                    | 2              | 82.0                | 81.0                       | 1577                | T4A          |

†De-rating may be required to account for specific environmental conditions (high ambient temperature, altitude, etc). Consult factory for de-rating information.

‡When not installed in a well ventilated environment, provisions must be made to account for heat generation to ensure proper operation of the device.

### Step 2 – Add Desired Options

Description add suffix

#### Communication Modules

|           |    |
|-----------|----|
| Profibus  | CP |
| Devicenet | CD |
| CAN Open  | CC |
| Modbus    | CM |
| Ethernet  | CE |

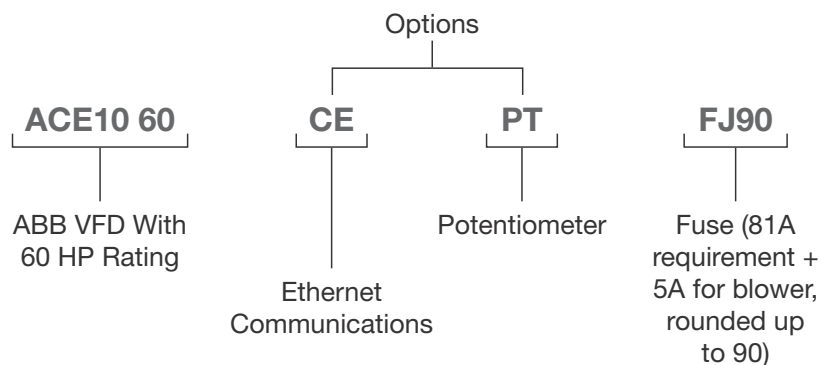
#### Potentiometer in Cover

|         |    |
|---------|----|
| AB 800H | PT |
|---------|----|

### Step 3 – Add Current Rating for Eaton's Bussmann Fuses



### Catalog Number Example:



### ACE Series Recommended Distributor Stock List:

| Description                                       | Cat. #    |
|---------------------------------------------------|-----------|
| Pre-filter and hardware (1 pc.)                   | ACE KIT 1 |
| Filter assembly (1 pc.)                           | ACE KIT 2 |
| Blower, manifold, and hardware (1 pc.)            | ACE KIT 3 |
| Pushbutton operator, finger, and hardware (1 pc.) | ACE KIT 4 |
| Temperature controller (1 pc.)                    | ACE KIT 5 |

\*5HP and below listed for Group B.

# ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

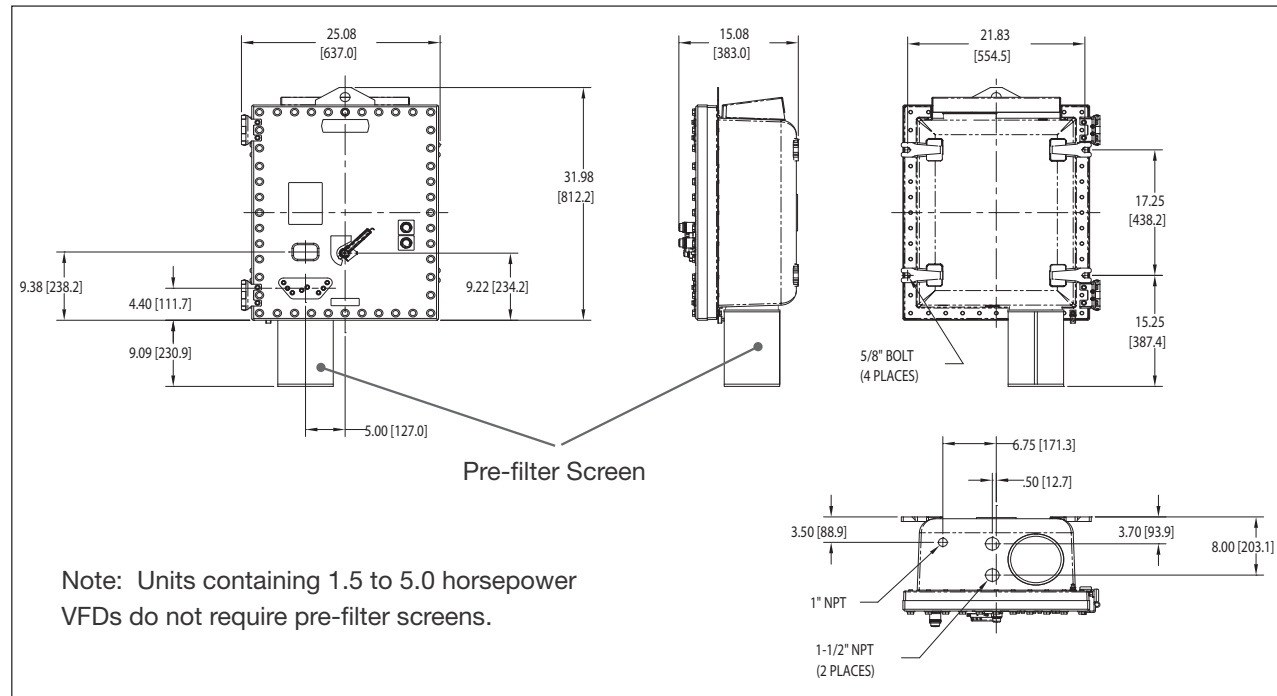
Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet locations

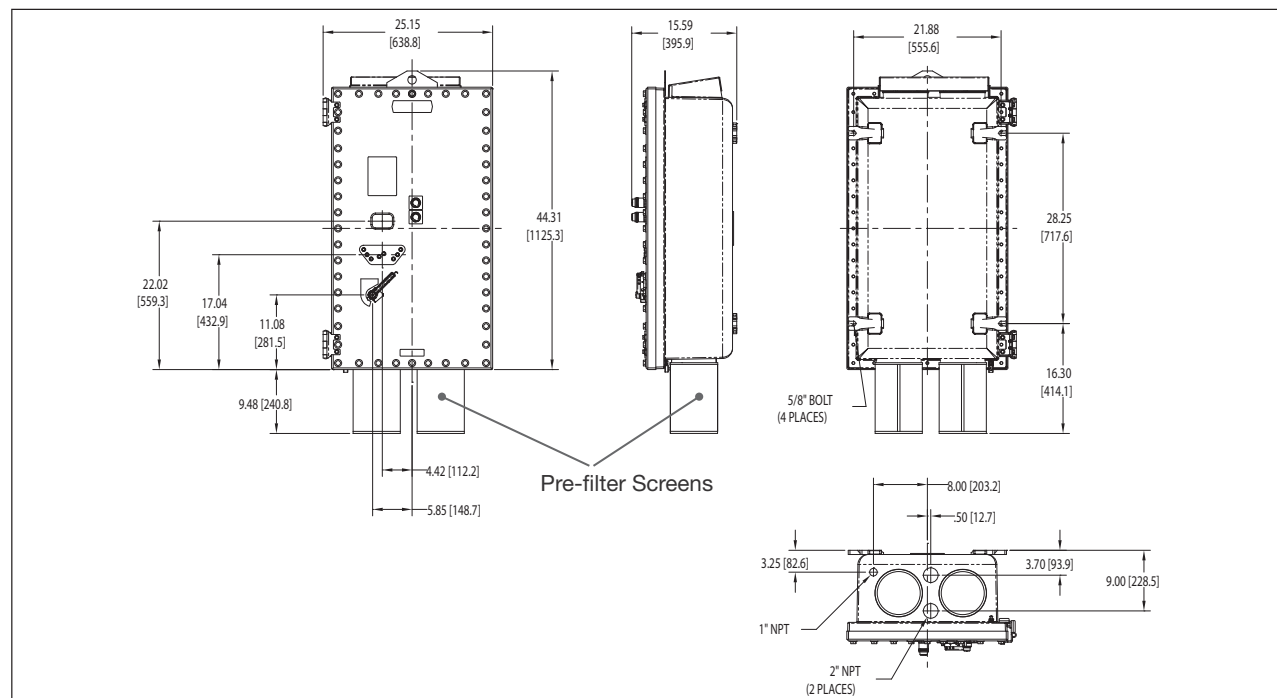
**6C**

## Dimensions

In Inches:



Enclosure Size 1 (1.5 to 10.0 Horsepower VFDs)



Enclosure Size 2 (15.0 to 60.0 Horsepower VFDs)

\*5HP and below listed for Group B.

**Crouse-Hinds**  
by **Eaton**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business



# ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

**6C**

## The only explosionproof VFD solution utilizing a NEMA 7 classified enclosure

Eaton's Crouse-Hinds Explosionproof VFDs are highly flexible AC drives designed specifically for hazardous area locations. These drives can be mounted next to the motor in the classified area, providing significant installation cost savings - along with the traditional VFD benefits of energy savings, speed and torque control, and system diagnostics.

This Eaton's Crouse-Hinds innovative product features the first ever NEMA 7 enclosure with active cooling, allowing the solution to be rated Class I, Divisions 1 and 2. It is designed to match the high requirements of pumps, compressors, fans, separators, and mixers in the following process industries:

- Oil and gas/refineries
- OEM skid builders
- Petrochemical
- Water/waste water
- Pharmaceutical
- Food and beverage manufacturing

### Applications:

- For speed control of pumps, compressors, fans, conveyors, separators, mixers, and other process equipment
- Designed to meet the high reliability and safety requirements of process industries such as oil and gas, chemical, and mining

## ACE Series System Benefits:

### Simple, Cost-Effective Installations

- ACE Explosionproof VFDs are installed 'on-machine' inside the hazardous areas, eliminating expensive, complicated installations
- There is no need to run long lines of conduit and motor cable, dig up roadways and sidewalks, navigate around obstacles and hazards or build off-site control rooms in non-hazardous areas to house VFD clusters
- Reflected Wave Syndrome is eliminated due to short motor cable runs

### Additional VFD Benefits:

#### Reduce Energy Costs Through Improved Process Control

- Fine speed and torque control optimizes system performance and reduces energy consumption

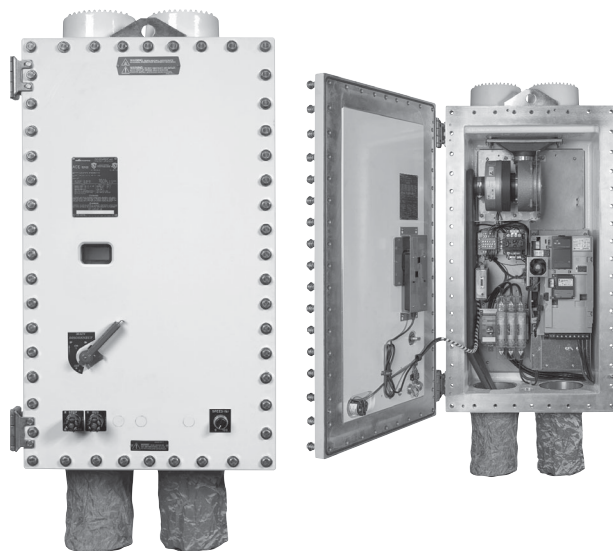
#### Reduce Operation and Maintenance Costs

- Reduce stress on electrical system
- Reduce water hammer effects with soft start capability
- Lower speed/load on bearings and seals
- Reduce risk of system damage due to cavitation

#### Avoid Downtime with Real-Time Equipment and Process Data

- Diagnostics help locate disturbances to the system and suggest remedies, allowing proactive maintenance decisions to be made

\*5HP and below listed for Group B.



### Certifications and Compliances:

- UL Classified  
Class I, Divisions 1 and 2, Groups B, C, D
- cUL Classified  
Class I, Divisions 1 and 2, Groups B\*, C, D
- Standards  
UL1203
- Environmental Ratings  
NEMA 3, 4X, 7BCD  
*NEMA 3X rating with PB23 or RR3 options added*  
Raintight  
Wet locations
- Operating Temperature Range  
0°C to 50°C (32°F to 122°F)

### Standard Materials and Finishes:

- Body and Cover – Copper-free aluminum, epoxy powder coated
- Operating Handle – Copper-free aluminum, epoxy painted
- Window – Tempered soda lime glass
- Blower – Aluminum, natural
- Filters – Stainless steel, natural
- Pre-filters – Stainless steel, natural
- Disconnect – Stainless steel, natural
- Shroud – Copper-free aluminum, epoxy painted
- Cover Hinges, Bolts, Washers and Springs – Stainless steel, natural
- Internal Brackets – Stainless steel, natural
- Manifold and Intake – EDPM rubber, natural

### Horsepower Ratings:

- Available up to 50HP
- Higher horsepower ratings coming soon

### VFD System Specifications:

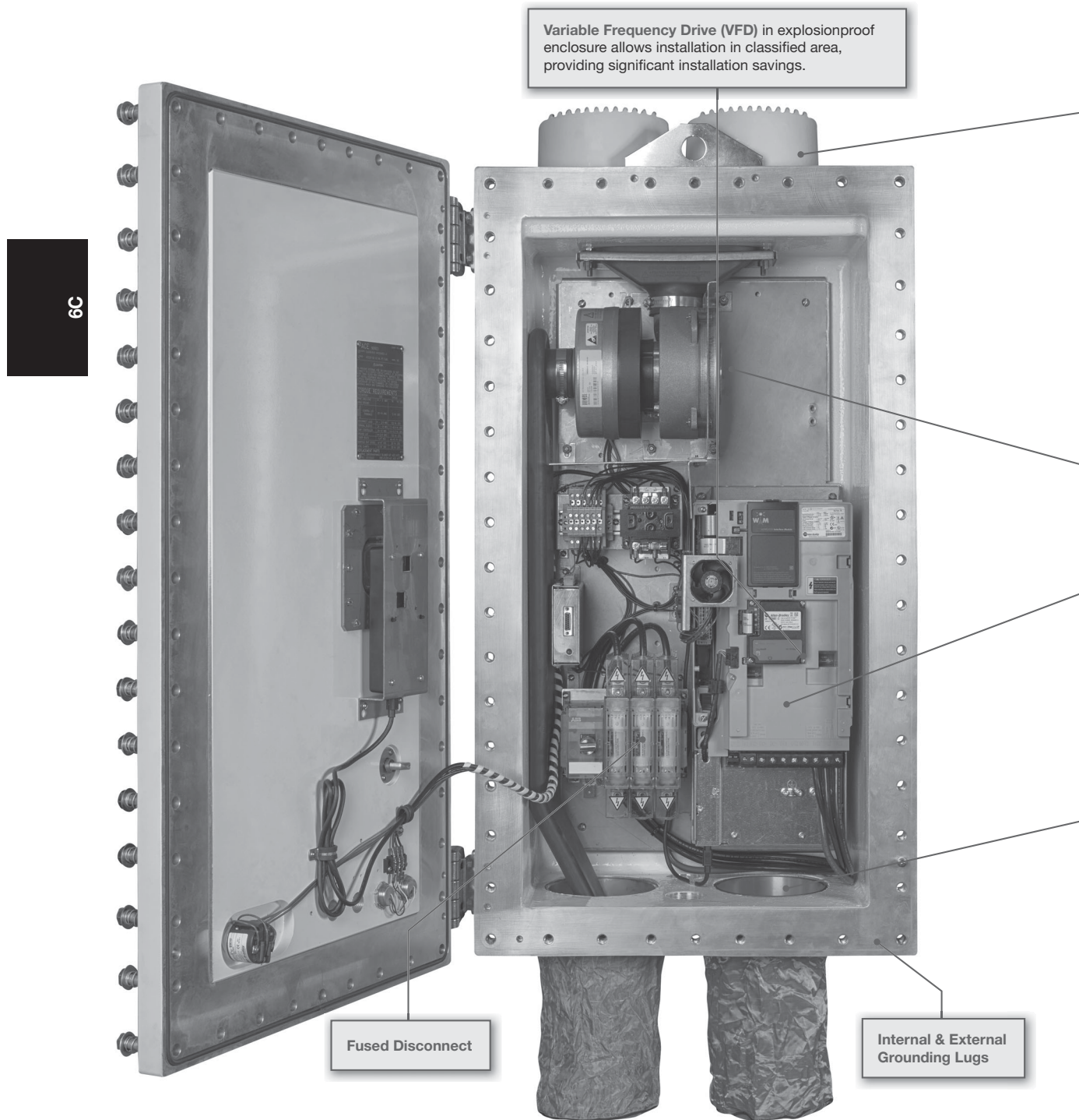
- Allen-Bradley® PowerFlex 700® Series low voltage, compact AC drives

6C

## ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex  
700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations



\*5HP and below listed for Group B.

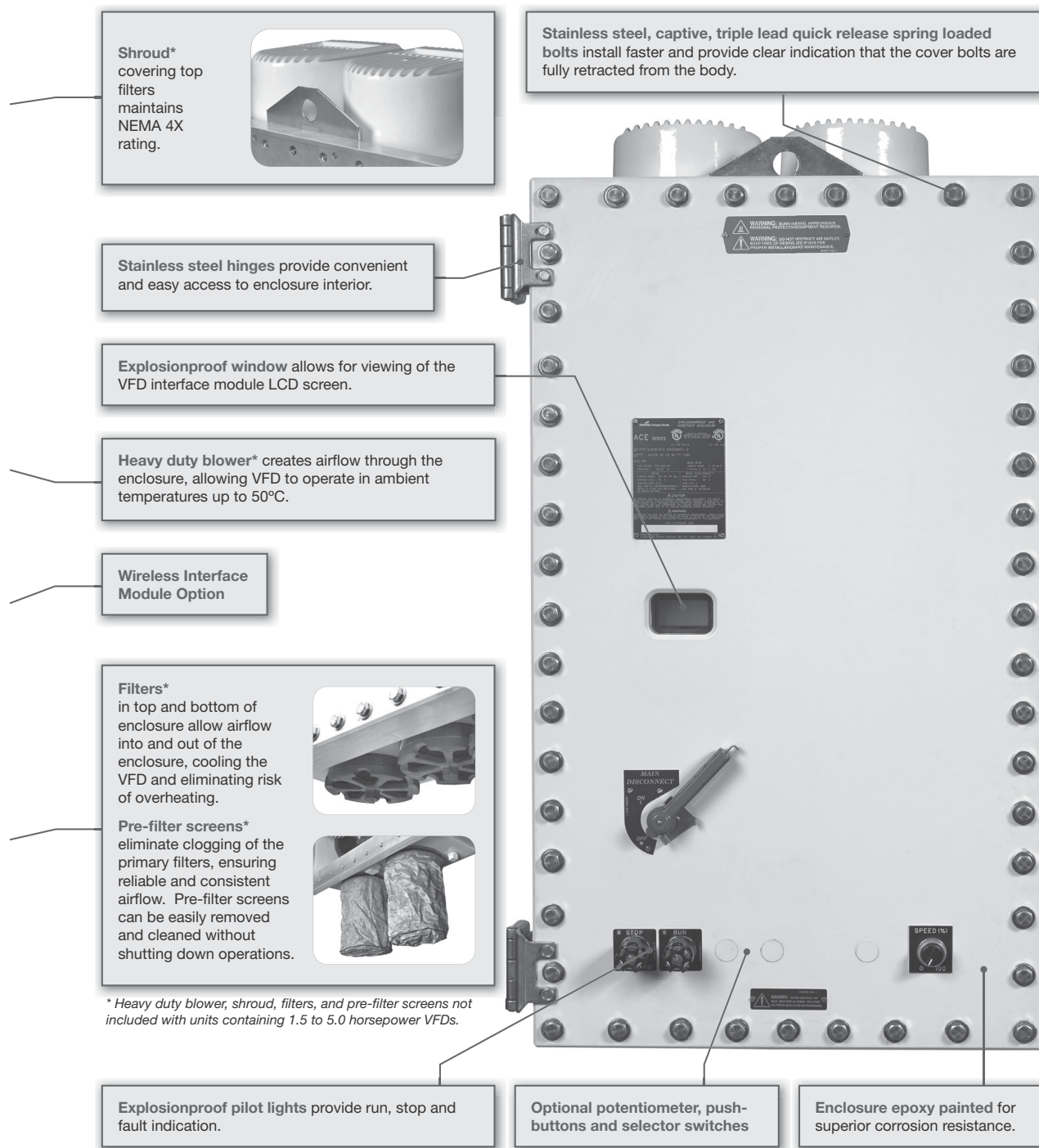


# ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

**6C**



\*5HP and below listed for Group B.



6C

## ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet locations

### Ordering Information:

#### Step 1 – Select VFD Horsepower Rating

| Cat. #   | Nominal Horsepower (KW) | Max. Disconnect Rating (Amps) | Disconnect Fuse Type | Enclosure Size | Input Rating (Amps) | Max. Output Rating (Amps)† | Power Loss (Watts)†† | Temp. Rating | VFD Manufacturer Part # |
|----------|-------------------------|-------------------------------|----------------------|----------------|---------------------|----------------------------|----------------------|--------------|-------------------------|
| ACE20 1  | 1                       |                               |                      |                | 1.6                 | 2.1                        | 63                   | T6           |                         |
| ACE20 2  | 2                       |                               |                      |                | 2.6                 | 3.4                        | 76                   | T6           |                         |
| ACE20 3  | 3                       | 30                            | J                    | 1              | 3.9                 | 5.0                        | 93                   | T6           | 20BD027A0AYNANCO        |
| ACE20 5  | 5                       |                               |                      |                | 6.9                 | 8.0                        | 164                  | T6           |                         |
| ACE20 7  | 7.5                     |                               |                      |                | 9.5                 | 11.0                       | 594                  | T4A          |                         |
| ACE20 10 | 10                      | 30                            | J                    |                | 12.5                | 14.0                       | 618                  | T4A          | 20BD027A0AYNANCO        |
| ACE20 15 | 15                      |                               |                      |                | 19.9                | 22.0                       | 726                  | T4A          |                         |
| ACE20 20 | 20                      |                               |                      |                | 24.8                | 27.0                       | 794                  | T4A          |                         |
| ACE20 25 | 25                      | 60                            | J                    | 2              | 31.2                | 34.0                       | 841                  | T4A          |                         |
| ACE20 30 | 30                      |                               |                      |                | 36.7                | 40.0                       | 859                  | T4A          |                         |
| ACE20 40 | 40                      |                               |                      |                | 47.7                | 52.0                       | 1010                 | T4A          | 20BD065A0AYNANCO        |
| ACE20 50 | 50                      | 100                           | J                    |                | 59.6                | 65.0                       | 1117                 | T4A          |                         |

Above data is for a 480V drive. For 600V drive, please consult factory.

†De-rating may be required to account for specific environmental conditions (high ambient temperature, altitude, etc.). Consult factory for de-rating information.

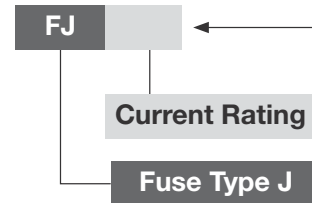
††When not installed in a well ventilated environment, provisions must be made to account for heat generation to ensure proper operation of the device.

#### Step 2 – Add Desired Options

| Description                  | Add Suffix      |
|------------------------------|-----------------|
| <b>Communication Modules</b> |                 |
| Profibus                     | CP              |
| Devicenet                    | CD              |
| CAN Open                     | CC              |
| Modbus                       | CM              |
| Ethernet                     | CE              |
| Wireless                     | WL              |
| <b>Options</b>               |                 |
| Potentiometer                | PT              |
| Hand-Off-Auto Switch‡        | RR3             |
| Pushbutton Start-Stop‡       | PB23            |
| 600 VAC VFD                  | Consult Factory |

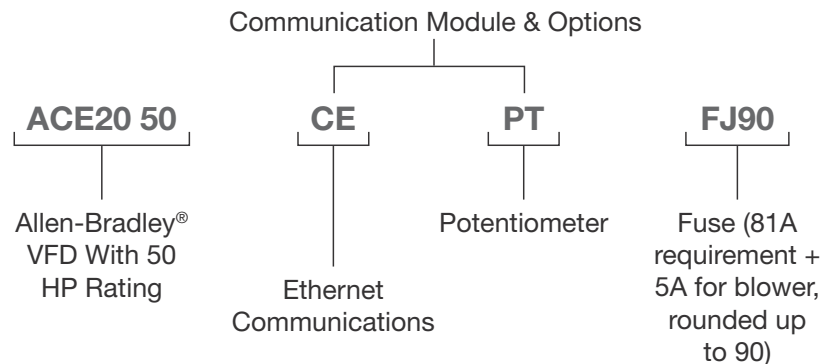
‡RR3 and PB23 cannot be ordered together.

#### Step 3 – Add Current Rating for Eaton's Bussmann Fuses



**Note:** Add 5 Amps to your requirements to account for cooling system blower and round up to the nearest increment of 5

#### Catalog Number Example:



#### ACE Series Recommended Distributor Stock List:

| Description                            | Cat. #    |
|----------------------------------------|-----------|
| Pre-filter and hardware (1 pc.)        | ACE KIT 1 |
| Filter assembly (1 pc.)                | ACE KIT 2 |
| Blower, manifold, and hardware (1 pc.) | ACE KIT 3 |
| Temperature controller (1 pc.)         | ACE KIT 5 |

\*5HP and below listed for Group B.

# ACE20 Series Explosionproof Variable Frequency Drives

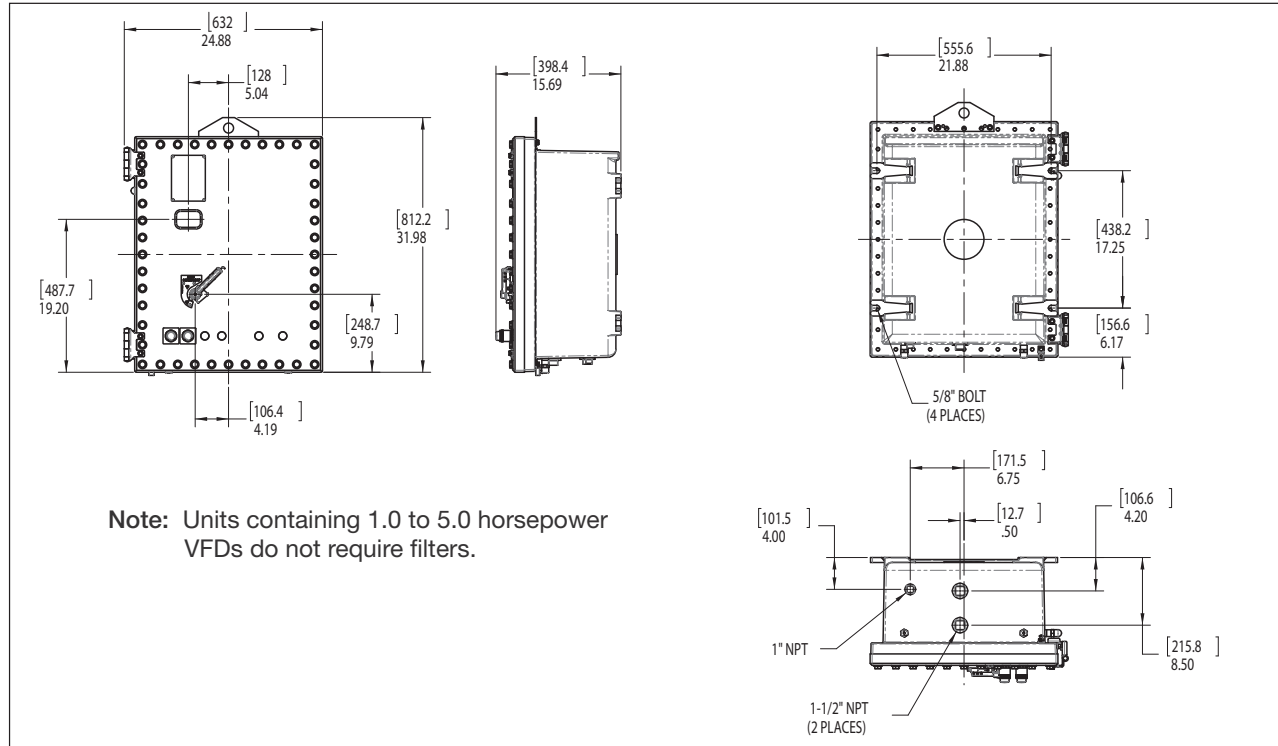
Utilizes Allen-Bradley® PowerFlex  
700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

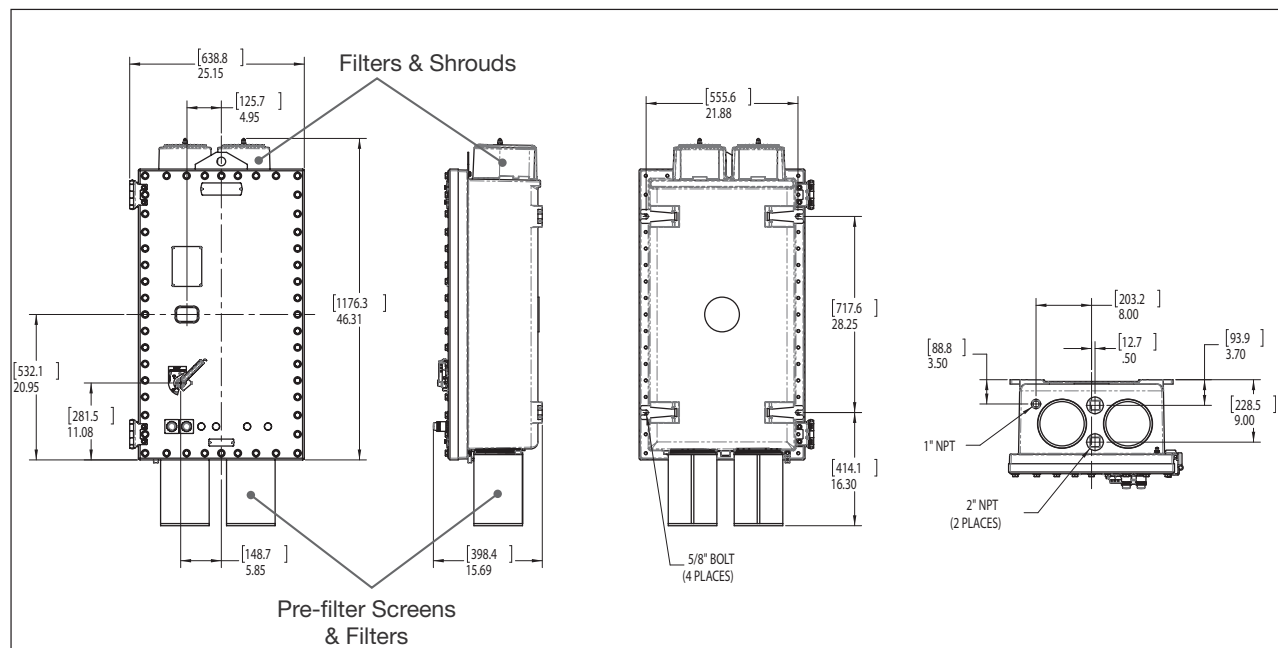
**6C**

## Dimensions

In Inches:



Enclosure Size 1 (1.0 to 5.0 Horsepower VFDs)



Enclosure Size 2 (7.5 to 50.0 Horsepower VFDs)

\*5HP and below listed for Group B.

**Crouse-Hinds**  
by **E.T.N**

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| Description         | Page No.          |
|---------------------|-------------------|
| Specialty Products  | see pages 612–613 |
| Switch Racks        |                   |
| General Information | see pages 614–617 |
| Bus Duct Assemblies | see pages 618–619 |
| Selection Guide     | see pages 620–622 |

## 7C Engineered Solutions

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### Applications:

- Custom engineered solutions for a wide variety of industrial and commercial applications
- Hazardous and non-hazardous products engineered to application-specific designs and customer requirements

### Capabilities:

- Product selection and application-specific support, including recommendations for material selection, ratings, and protection
- Project bid support
- Engineering design services
- Custom product design
- Value-add packages for: ease of installation, ease of maintenance, labor savings, integrated packages, and portable products

### Certifications and Compliances\*:

- NEC:
  - Class I, Divisions 1 & 2, Groups A, B, C, D
  - Class II, Divisions 1 & 2, Groups E, F, G
  - Class III
- NEMA: 3, 3R, 4, 4X, 7BCD, 9EFG, 12

\*Ratings may not be available or relevant for every proposal.

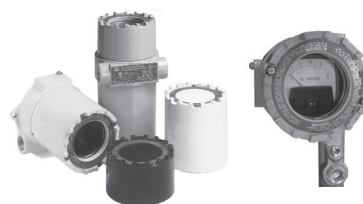
### Labor Saving Solutions:

- Product sub-assemblies and sub-systems
- Pre-fixture products, pre-terminated cables, plugs, fittings, and glands



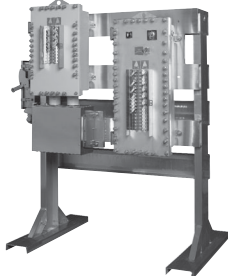
### Integrated Solutions:

- Enclosed metering and instrumentation
- Component populated enclosures
- Custom machining, painting, and legend
- Installed fittings and seals



### Ease of Installation Solutions:

- Rack assemblies - control, distribution, protection, monitoring
- Skid assemblies
- Pre-wired products



### Portable Solutions:

- Power distribution
- Lighting products
- Plugs
- Protection equipment



Interested in a custom engineered product? Contact your local Eaton's Crouse-Hinds sales representative to see how we can design a solution for you. Fill out the request form on the following page to receive a custom quote for your inquiry.

# Engineered Solutions

## Request a Quote

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

7C

Customer: \_\_\_\_\_  
Project: \_\_\_\_\_  
Prepared By: \_\_\_\_\_  
Quotation For: ☐ Estimate/Budget ☐ Bid  
Quotation Required By (Date): \_\_\_\_\_

Engineering Firm: \_\_\_\_\_  
Location: \_\_\_\_\_  
Date: \_\_\_\_\_  
☐ Immediate Buy  
Material Required By (Date): \_\_\_\_\_

Is a current copy of plant STDS/SPECS available to Eaton's Crouse-Hinds? \_\_\_\_\_

### Area Classification:

**HAZARDOUS** - Circle all that apply:

☐ Class I ☐ Div. 1 ☐ Div. 2  
Groups B, C, D ☐ B ☐ C ☐ D

☐ Class II ☐ Div. 1 ☐ Div. 2  
Groups E, F, G ☐ E ☐ F ☐ G

☐ Class III

### NON-HAZARDOUS

☐ Ordinary Locations

NEMA Rating ☐ 3R ☐ 4 ☐ 4X

### Dimension Restrictions:

☐ Width \_\_\_\_\_ ☐ Height \_\_\_\_\_  
☐ Depth \_\_\_\_\_

### Service System: (i.e. 480V, 3PH, 3W, 60 Hz)

\_\_\_\_ VOLT \_\_\_\_ PH \_\_\_\_ W \_\_\_\_ HZ \_\_\_\_ AMP

### Products Involved (Select all that apply):

☐ Control & Apparatus ☐ Plugs & Receptacles  
☐ Fittings & Glands ☐ Commercial Products  
☐ Lighting ☐ Other

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please attach any supporting documentation to this form, including: sketches, single line diagrams, drawings, bill of materials, specifications, etc.

CONTACT: E-mail: [crouse.customerctr@cooperindustries.com](mailto:crouse.customerctr@cooperindustries.com)  
Phone: (866) 764-5454

|                                   |                    |
|-----------------------------------|--------------------|
| Cl. I, Div. 1 & 2, Groups B, C, D | Explosionproof     |
| Cl. II, Div. 1, Groups E, F, G    | Dust-Ignitionproof |
| Cl. II, Div. 2, Groups F, G       | Raintight          |
| Cl. III                           | Wet Locations      |
| NEMA 3, 4X, 7BCD, 9EFG, 12        | Watertight         |

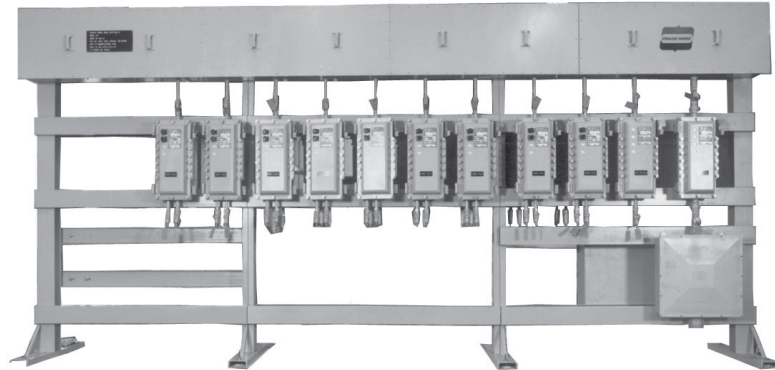
## Applications:

Free-standing switch rack assemblies are used:

- To provide a complete motor control center in one integrated package
- Outdoors and indoors
- In damp, wet or corrosive locations such as sewage treatment plants, lumber mills, marine installations, and food preparation areas
- In areas made hazardous due to the presence of flammable vapors or gases, such as petroleum refineries, chemical and petrochemical plants, gas gathering plants, pipeline compressor stations, and drilling rigs, both onshore and offshore
- In areas where hazardous dusts are present, such as coal handling facilities, grain processing and handling plants, and certain food process industries

## Features:

- Complete factory assembled and wired switch racks
- Pre-drilled bus boxes allow for quick and easy changing or adding of components
- Complete assembly covered under one order, eliminates engineering costs, additional costs of placing separate orders with several vendors for various components, and assembly and scheduling problems at job site
- Wiring is simple. After switch rack is in place, feeders are connected to the main bus and connections made from starters motors. No other field wiring is necessary
- Maintenance time and costs are reduced by having controls grouped. Work is performed in one location instead of moving from one control to another in various locations
- Major components are standard EBM, EPC, NMC, NMG, NCB, FLB, D2PB, EXD, D2D, EPL, and D2L enclosures featuring ready access to starters and breakers for inspection and maintenance
- Custom built racks to meet your exact requirements are an Eaton's Crouse-Hinds specialty. Complete quotations will be supplied for any job, large or small (38' length max)



## Certifications and Complies:

- NEC:
  - Class I, Divisions 1 & 2, Groups C, D (Group B optional)
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 4X (optional), 7B (optional) CD, 9EFG, 12

## Standard Materials:

- Rack frames – structural steel or aluminum channel members, bolted and welded
- Components – see sections A & C for material

## Standard Finishes:

- Rack frame – hot dip galvanized steel or natural aluminum
- Components – see sections A & C for finishes

## Options:

- Rack frame finish – corrosion resistant primer with air dry epoxy
- Options listed for individual components can be incorporated in complete switch racks



## Construction:

### General:

- All construction to be in accordance with current National Electrical Code® (NEC), National Electrical Manufacturers' Association (NEMA), state and local standards as designated by the purchaser.
- All hazardous area enclosures for motor starters, combination motor starters, circuit breakers, motor circuit protectors, instrument enclosures, panelboards, main bus, fittings, receptacles, and lighting fixtures shall be made and supplied by the manufacturer.
- All explosionproof threaded enclosures for combination starters, circuit breakers, motor circuit protectors, and starters shall be UL classified.
- All other standard hazardous area enclosures shall be UL listed or UL classified.
- Manufacturer shall retain permanent records of all motor control racks and shall have the capability of duplicating, or replacing, any fully-assembled rack or rack component.
- Manufacturer to assume responsibility for construction, purchase/manufacturer of components, complete circuit continuity testing, and testing of mechanical functions of components.

## Rack Frame Design:

### Structure:

- Switch rack, either single or double face as required, shall be rigid, free-standing structures. Racks shall be factory-welded, assembled and fabricated from standard rolled structural steel or aluminum shapes.
- Vertical risers will be 6" I-beam and horizontal members shall be 6-inch channel.
- Mounting feet shall be 6-inch channel. Width of such feet for single-sided racks shall be 41 inches.
- End mounting feet will be braced (welded) to the upright with 6" T member.
- Mounting feet shall be anchored at the job site with 1-inch diameter bolts. Anchor bolts and mounting pads will be the responsibility of the user.
- Maximum horizontal spacing between mounting legs shall not exceed 6 feet. (Specific dimensions to be determined by the manufacturer.)
- Racks longer than 20 feet will be supplied as bolt-together sections. (Specific section dimensions to be determined by the manufacturer.)

### Grounding:

- A pressure-type grounding lug with appropriate wire capacity will be provided at each end of frame.

### Finish:

- Rack frame shall be hot-dip galvanized after fabrication or natural aluminum.

## Main Bus Equipment:

### Class I, Division 1:

- Main bus material shall be copper only and capable of withstanding up to 65K amps fault current. Cable bus will be wired to terminal blocks enclosed in cast, copper-free aluminum, explosionproof junction boxes, Eaton's Crouse-Hinds type EJB. Such junction boxes for incoming power and distribution wiring shall be provided at either the top or bottom of the rack. Enclosures shall be connected by rigid conduit with conduit seals installed in accordance with the NEC. Load conduit or cable will leave rack either below or above. Manufacturer shall provide conduit layouts.

### Class I, Division 2:

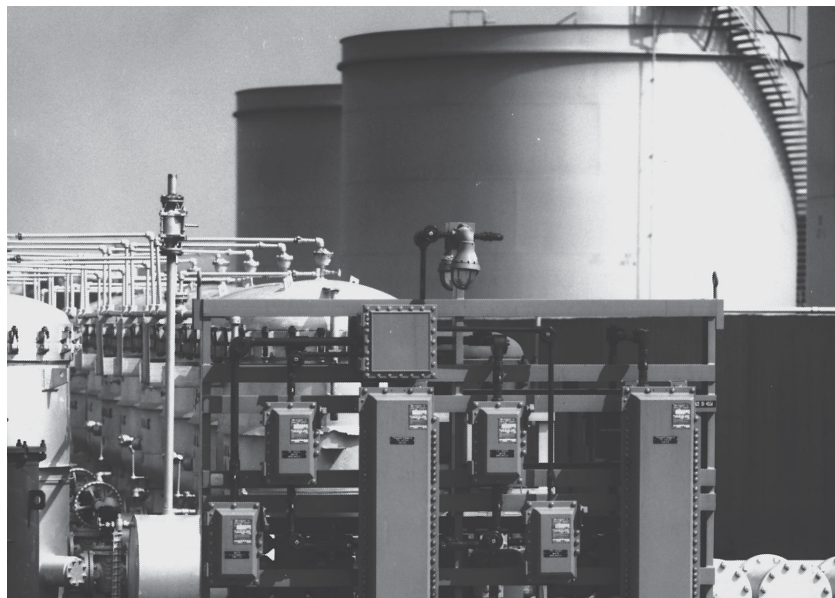
- Main bus material shall be copper only and capable of withstanding up to 65K amps fault current. Cable bus will be wired to terminal blocks enclosed in cast, copper-free aluminum weathertight junction boxes, Eaton's Crouse-Hinds type WJB. Such junction boxes for incoming power and distribution wiring shall be provided at either the top or bottom of the rack. Enclosures shall be connected by rigid conduit with conduit seals installed as required by the NEC. Load conduit or cable will leave rack either below or above. Manufacturer shall provide conduit layouts.

## Bus Duct in Lieu of Junction Boxes (Optional):

- Cable bus will be wired to a weathertight bus duct provided at the top or bottom of the rack.

## Canopy (Optional):

- Single- or double-pitched canopy shall have minimum 15-degree pitch with a minimum 7'6" ground clearance, and 2-foot overhang. Roofing material shall be corrugated aluminum. Canopy roof trusses, cross channels, roof material, and mounting hardware shall be shipped unassembled for quick assembly at the job site. All holes in structure shall be provided except for roof mounting holes which will be drilled in the field. Manufacturer will supply drawings and material for complete field assembly of canopy.



Eaton's Crouse-Hinds switch rack installed in a fuel storage area.

## Motor Control Components:

### Explosionproof Quick Opening Enclosures:

- All circuit breakers, motor circuit protectors and combination or across-the-line motor starters shall be enclosed in quick-opening enclosures (Eaton's Crouse-Hinds types EBM or EPC).

#### Types:

- Ground joint bolted cover enclosure shall be Eaton's Crouse-Hinds type EBM, Underwriters Laboratories Inc. classified for use in Class I, Groups C, D, Divisions 1 and 2, Class II, Groups E, F, G, Divisions 1 and 2 and Class III hazardous locations and shall also be suitable for Type 3, 3R and/or Type 4 (NEMA 3, 3R and 4) areas.
- All enclosures shall be cast of a corrosion-resistant copper-free aluminum alloy (less than 0.4% copper) and shall be of a semi clamshell design with external flange to promote ease of apparatus installation, adjustment and maintenance. Most importantly, enclosure inside dimensions shall conform to the wire bending space requirements of the National Electrical code NFPA70 paragraph 373-6. Enclosures with flat covers, internal flanges or those not conforming to NFPA70 paragraph 373-6 are not permitted.
- Covers shall be hinged on the left side and, when closed, shall be affixed top the body by multiple lead thread bolts to promote quick opening and closing of the enclosure.
- Cover bolts shall be hex head stainless steel without screwdriver slots, to promote the use of a socket or wrench for proper tightening. They shall be captive to the cover and stainless steel spring loaded to indicate the fully unthreaded position. Spring loading shall give visual indication that the bolts are free of the body when the cover is being opened. The cover flange ground joint shall have an integral gasket to prevent the entry of windblown dust, rain or sleet.
- All enclosures shall be fitted, as standard, with adjustable, extended, corrosion-resistant, copper-free aluminum hinges that shall allow the cover to swing away from the body when opened and shall permit unobstructed working space for maintenance, adjustment or replacement of the internal apparatus. Additionally these hinges shall allow minimum enclosure-to-enclosure spacing with little interference between an open cover and an adjacent enclosure. Enclosures with hinges fabricated from steel or aluminum stampings shall not be permitted.
- All enclosures shall be provided with drilled, tapped and plugged conduit entrances suitably sized for the electrical application. Power conduit entrances shall be located 1 (or 2) each on (or equally spaced from) the enclosure vertical centerline at top and bottom. A single, plugged 1" entrance for a control conduit shall be provided at the bottom of the enclosure. (Some enclosures can also be provided with a plugged 1" entrance for control conduit at the top.)
- All conduit entrances shall be furnished with removable copper-free aluminum reducers, each with integral wire pulling bushing. All conduit entrances shall be located the same distance from the enclosure mounting surface to facilitate conduit run layout and/or stub up construction.
- All enclosures shall have rugged, cast copper-free aluminum circuit breaker and motor starter overload reset operating handles located on the right side of the enclosure. These handles shall operate the internal mechanisms via stainless steel, gasketed shafts and bearings through the side wall of the body. Correct circuit breaker and overload reset operation shall be visually confirmed with the cover open.
- Circuit breaker handles shall be padlockable in either the "OFF" or "ON" position, and shall be trip-free of the circuit breaker itself. An attached indicating plate shall give clear, visual confirmation of the circuit breaker status.
- Adjustable circuit breaker handle stops shall be provided to ensure full operation of the circuit breaker and to prevent handle overthrow that could damage the circuit breaker toggle.
- Motor starter overload reset operating mechanisms shall be field adjustable.
- Threaded construction enclosures shall be Eaton's Crouse-Hinds type EPC, Underwriters Laboratories, Inc. classified for use in Class I, Groups C, D, Divisions 1 and 2, Class II, Groups E, F, G Divisions 1 and 2 and Class III hazardous locations and shall also be suitable for Type 3, 3R and/or Type 4 (NEMA 3, 3R and 4) areas.
- All enclosures shall be cast of a corrosion-resistant copper-free aluminum alloy (less than 0.4% copper) and shall be of a three section design. Multiple-start straight buttress threads between the covers and the body shall ensure quick access to the interior in less than two full turns of the covers. A system of stops shall prevent overtightening and thread seizing. A system of locks shall prevent covers from loosening due to external vibration.
- Female threads on the top cover with male threads on the bottom cover shall ensure inherent water and rain shedding.
- All exposed screws, bolts and hardware shall be stainless steel.
- The external circuit breaker operating handle affixed to a stainless steel shaft, shall be padlockable in either the "ON" or "OFF" position with up to three padlocks. Circuit breaker mechanisms shall be trip-free of the circuit breaker itself to allow the circuit breaker to open under overload conditions even if it is locked in the "ON" position.
- The mounting bracket shall provide a three-point suspension system for quick installation and adjustment.
- Conduit entrances shall have integral wire pulling bushings and conduit stops. These openings shall be arranged two at the top and two at the bottom and shall be sized for power and control requirements.

### General:

- All enclosures shall be bolted to the horizontal frame members on either the front or back or both front and back. Enclosures shall be connected to the main bus via conduit seals. (To be field poured). All hardware used to mount the enclosures shall be stainless steel.

## Lighting Panelboards:

### Class I, Division 1:

- Panelboards shall be Eaton's Crouse-Hinds type, factory-sealed EXD or EPL as specified and shall meet the following electrical ratings:  
EPL – 1, 2 or 3 pole, 240 volt maximum, 100 amp maximum branch trip rating, 10,000 AIC.  
EXD – 1, 2 or 3 pole, 600 volt maximum, 100 amp maximum branch trip rating.

### Class I, Division 2:

- Lighting panelboard shall be Eaton's Crouse-Hinds type D2L factory-sealed, 120 / 240 volt panelboards and be provided with single-pole, two-pole, or three-pole branch circuit breakers with up to 100 amp trip rating; main breaker ranging to 225 amp. Similarly, lighting panelboard shall be type D2PB factory-sealed, 120 / 240 volt panelboards and be provided with single-pole or two-pole factory sealed circuit breakers with 15, 20 or 30 amp trip ratings and maximum 10,000 AIC. Power panelboards type D2D factory-sealed, up to 600 volt are provided with single-pole, two-pole, or three-pole branch circuit breakers with up to 100 amp trip ratings; main breaker rating to 225 amp.

## NEMA 4X Option:

- All bus boxes, control enclosures and lighting panelboards will be made of KRYDON® material to meet NEMA 4X requirements.

## Fittings:

- All fittings shall be made and provided by the manufacturer. Seals and unions will be provided for each incoming and outgoing conduit as required. All interconnections between components shall be done by the manufacturer with galvanized rigid conduit, and conduit fittings as required to meet the hazardous classification. Interconnecting conduits to be provided with conduit seals as required. All incoming and outgoing rack conduit entrances shall include conduit seals as required by the hazardous location specified. Such seals will be provided by the manufacturer and will not be filled where field wiring is to be introduced.

## Conduit Boxes, Outlet Boxes, Device Boxes:

- Conduit boxes, outlet boxes, and device boxes shall be Eaton's Crouse-Hinds *Condulet*® fittings.

### Seals:

- Seals will be standard Eaton's Crouse-Hinds type *Condulet* EYS. (Eaton's Crouse-Hinds *Condulet* EYD drains to be specified as required.)

### Unions:

- Unions will be Eaton's Crouse-Hinds UNY.

### Breathers and Drains:

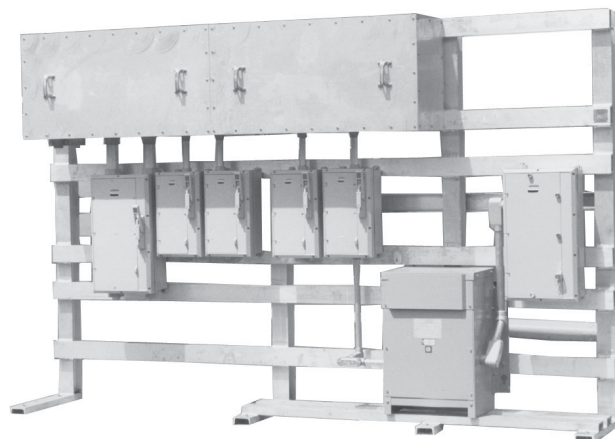
- Breathers and drains shall be Eaton's Crouse-Hinds ECD.

## Wiring:

- Standard wire shall be copper only, 600 volt, 75°C minimum rating, UL listed.
- No power wire less than 12AWG shall be used.
- Control wire shall be 14AWG minimum, 7 strands, THW minimum.
- Wiring shall be sized in accordance with the NEC requirements.

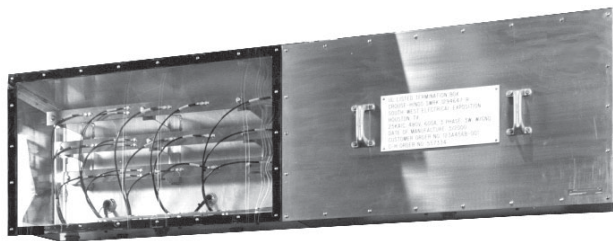
## Drawings:

- Standard drawings supplied for customer approval shall include complete rack wiring diagram, component data, nominal weight of the rack, and overall rack dimensions.



## Applications:

- Eaton's Crouse-Hinds is now offering NEMA 3R, UL Listed Bus Duct (Termination Box) Assemblies as standard product. Up to 600V, three-phase, 3 or 4 wire, 400Amp or 600Amp service with short circuit ratings of 25K or 50K.
- Bus ducts or termination boxes provide a means of tapping feeder circuits for power distribution on outdoor switchrack assemblies or indoor wall-mounted applications.
- Typical application is primarily for bus replacements on existing switchrack installations. New applications may include on-site construction of switchracks or indoor feeder distribution points due to space confinements making local installation more practical.



## Features:

- UL Listed.
- NEMA 3R.
- Maximum voltage rating 600V.
- 400 Amp or 600 Amp @ 25KAIC or 50KAIC.
- External flange on bus duct enclosure and lip on covers prevents water leakage and allows covers to hang freely for ease of installation and maintenance.
- 3 degree pitch at top, for water run-off, on all flush mounted bottom entry designs.
- Chlorosulfonated polyethylene (Hypalon®) gasket material at all bus box section joints, covers and end plates.
- Standoff (Glastic) insulators molded of (UL) recognized flame-resistant fiberglass-reinforced thermoset polyester molding compound.
- Bus bar sizing and bracing complies to UL857 requirements.
- All welded construction - sheet aluminum, sheet steel (galvanized), or stainless steel.
- Stainless steel hardware throughout.
- Two hole compression lugs at all power phase connectors attached with stainless steel hardware.
- One (1) drain is standard per bus duct section (typical 4 foot sections).
- Solid copper bus bars (tin, silver plated and/or insulated – optional per customer request).
- Solid copper ground bar – standard.
- Incoming main lugs – supplied size and location specified with customer.
- Space heaters – optional per customer request.
- Pre-drilled copper bars (when specified by customer).
- Conduit entries for Myers hubs – optional per customer request.

Bus Duct (Termination Box)  
Catalog Numbering System

7C

|                                               |          |          |          |           |          |          |           |           |
|-----------------------------------------------|----------|----------|----------|-----------|----------|----------|-----------|-----------|
|                                               | <b>B</b> | <b>S</b> | <b>T</b> | <b>16</b> | <b>A</b> | <b>6</b> | <b>K5</b> | <b>DR</b> |
| <b>BUS DUCT</b> _____                         |          |          |          |           |          |          |           |           |
| NEMA Type 3R                                  |          |          |          |           |          |          |           |           |
| <b>DOOR TYPE</b> _____                        |          |          |          |           |          |          |           |           |
| S=Single-sided (door on one side)             |          |          |          |           |          |          |           |           |
| D=Double-sided (doors on both sides)          |          |          |          |           |          |          |           |           |
| <b>MOUNTING LOCATION</b> _____                |          |          |          |           |          |          |           |           |
| T=Top mounting (bottom entries)               |          |          |          |           |          |          |           |           |
| B=Bottom mounting (top entries)               |          |          |          |           |          |          |           |           |
| <b>LENGTH-FEET</b> _____                      |          |          |          |           |          |          |           |           |
| 02 = 2 feet                                   |          |          |          |           |          |          |           |           |
| 04 = 4 feet                                   |          |          |          |           |          |          |           |           |
| 06 = 6 feet                                   |          |          |          |           |          |          |           |           |
| 08 = 8 feet                                   |          |          |          |           |          |          |           |           |
| 12 = 12 feet                                  |          |          |          |           |          |          |           |           |
| 16 = 16 feet                                  |          |          |          |           |          |          |           |           |
| 20 = 20 feet                                  |          |          |          |           |          |          |           |           |
| 24 = 24 feet                                  |          |          |          |           |          |          |           |           |
| 28 = 28 feet                                  |          |          |          |           |          |          |           |           |
| 32 = 32 feet                                  |          |          |          |           |          |          |           |           |
| 36 = 36 feet                                  |          |          |          |           |          |          |           |           |
| <b>ENCLOSURE MATERIAL - SHEET METAL</b> _____ |          |          |          |           |          |          |           |           |
| A = Aluminum                                  |          |          |          |           |          |          |           |           |
| G = Galvanized                                |          |          |          |           |          |          |           |           |
| S = Stainless steel (316)                     |          |          |          |           |          |          |           |           |
| <b>AMP RATING OF COPPER BARS</b> _____        |          |          |          |           |          |          |           |           |
| 4 = 400A                                      |          |          |          |           |          |          |           |           |
| 6 = 600A                                      |          |          |          |           |          |          |           |           |
| <b>KAIC SHORT CIRCUIT RATING</b> _____        |          |          |          |           |          |          |           |           |
| K2 = 25KAIC                                   |          |          |          |           |          |          |           |           |
| K5 = 50KAIC                                   |          |          |          |           |          |          |           |           |
| <b>OPTIONS COVERED BY DR#</b> _____           |          |          |          |           |          |          |           |           |
| Space heaters                                 |          |          |          |           |          |          |           |           |
| Insulated bars                                |          |          |          |           |          |          |           |           |
| Silver plated bars                            |          |          |          |           |          |          |           |           |
| Pre-drilled copper bars                       |          |          |          |           |          |          |           |           |
| Conduit entries with Myers hubs               |          |          |          |           |          |          |           |           |

One (1) drain is standard per bus duct (termination box) section.

For pricing and lead times, contact Eaton's Crouse-Hinds Customer Service at 866-764-5454 or fax to 315-477-5179.

7C



## Selection Guide

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 4X, 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

Customer: \_\_\_\_\_ Engineering Firm: \_\_\_\_\_  
 Project: \_\_\_\_\_ Location: \_\_\_\_\_  
 Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Quotation For: ☐ Estimate/Budget ☐ Bid ☐ Immediate Buy  
 Quotation Required By (Date) \_\_\_\_\_ Material Required By (Date) \_\_\_\_\_

Interested in a highly reliable, comprehensive communications that will improve the operating efficiency of your facility? See additional information at the end of this guide.

Is a current copy of plant STDS/SPECS available to Eaton's Crouse-Hinds? \_\_\_\_\_

**Area Classification:**

**HAZARDOUS** - Circle All that apply:

- ☐ Class I  
 Div. 1 or 2, Grps B, C & D  
☐ Class II  
 Div. 1 or 2, Grps E, F & G  
☐ Class III

**NON-HAZARDOUS**

- ☐ Ordinary Locations  
☐ NEMA 3R, 4, 4X (Circle One)

**Structural Frame:****MATERIAL**

- ☐ Steel  
☐ Aluminum  
☐ Single Face  
 (Components on ONE side only)  
☐ Double Face  
 (Components on BOTH sides)  
☐ Other \_\_\_\_\_  
☐ Percent Spare Space \_\_\_\_\_ %

**FINISH**

- ☐ Hot Dip Galvanized  
☐ Painted

**Roof Canopy:**

- ☐ Yes ☐ No  
☐ Corrugated Aluminum  
☐ Corrugated Fiberglass

**Enclosure Type:**

- ☐ Bolted ☐ Threaded  
☐ Krydon ☐ Epoxy Coated

**Dimension Restrictions:**

- ☐ Length \_\_\_\_\_ ☐ Height \_\_\_\_\_

**Service System:** (i.e. 480V, 3PH, 3W, 60HZ)

\_\_\_\_\_ VOLT \_\_\_\_\_ PH \_\_\_\_\_ W \_\_\_\_\_ HZ

**Incoming Feeder Requirements:**

- \_\_\_\_\_ # Conductors/Phase  
 \_\_\_\_\_ # AWG/MCM  
 \_\_\_\_\_ # Inch Conduit (Size)  
☐ Top Entry ☐ Bottom Entry

**Main Bus Enclosure:****MATERIALS**

- ☐ Steel  
☐ Aluminum  
☐ Other (Specify) \_\_\_\_\_  
☐ Bus Location - Top of Rack  
☐ Bus Location Bottom of Rack  
☐ Bus Bracing \_\_\_\_\_ (25 KAIC Standard)  
☐ Bus Amps \_\_\_\_\_  
☐ Other - Customer to Specify

**FINISH**

- ☐ Hot Dip Galv.  
☐ Painted

**MAIN BUS CHARACTERISTICS**

- Copper Bars  
☐ Bare (Standard) ☐ Power Distr. Block  
☐ Insulated ☐ Ground Bus in Enclosure  
☐ Silver Plated  
☐ Tin Plated

# Switch Rack Assemblies

## Selection Guide

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

7C

### Main Breaker/Disconnect: (3C,N)

☐ None ☐ Molded Case Breaker  
AIC Rating \_\_\_\_\_  
Amp Trip (AT)/ \_\_\_\_\_ Amp Frame (AF) \_\_\_\_\_  
☐ Disconnect Switch  
\_\_\_\_\_ Amps  
☐ Fused ☐ Non-Fused

### Equipment Requirements:

#### COMBINATION MOTOR STARTERS (1C, N)

FVNR, Reversing, 2-speed (circle one)  
Qty. \_\_\_\_\_

\_\_\_\_\_ NEMA Size 0 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 1 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 2 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 3 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 4 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 5 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 6 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP

Refer to Eaton's Crouse-Hinds catalog for suggested breaker or motor circuit protector sizing if not specified above, Eaton's Crouse-Hinds will size accordingly.

#### OPTIONS REQUIRED

\*Unless specified differently \*options furnished standard

|                                                            | Yes   | No    |
|------------------------------------------------------------|-------|-------|
| *Fused Control Transformer<br>Suffix FTPS                  | _____ | _____ |
| Space Heaters<br>Suffix R11, R22, R44                      | _____ | _____ |
| Start/Stop Pushbuttons<br>Suffix PB23                      | _____ | _____ |
| Hand-Off Auto Selection Switch<br>Suffix RR3               | _____ | _____ |
| Red Indicating Light Suffix J1                             | _____ | _____ |
| Green Indicating Light Suffix J3                           | _____ | _____ |
| *Auxiliary Contacts: (2 N.O./2NC)<br>Suffix S782           | _____ | _____ |
| Control Relay<br>Suffix S787                               | _____ | _____ |
| *Breather/Drain Suffix S198V/S756V                         | _____ | _____ |
| *12 Point Terminal Block<br>Other - Specify<br>Suffix S786 | _____ | _____ |

‡ Not available with D2PB panelboards.

### Feeder Circuit Breaker: (3C, N)

AIC Rating \_\_\_\_\_  
Qty \_\_\_\_\_ (AT) \_\_\_\_\_ (Specify)  
\_\_\_\_\_ /100/150 AF  
\_\_\_\_\_ /100/150 AF  
\_\_\_\_\_ /225/250 AF  
\_\_\_\_\_ /400 AF  
\_\_\_\_\_ /800 AF  
\_\_\_\_\_ Other

### Component Preference:

☐ Cutler-Hammer ☐ SQD ☐ A-B ☐ GE  
(Cutler-Hammer will be used if no preference is indicated.)

### Distribution Transformers:

\_\_\_\_\_ KVA \_\_\_\_\_ PH \_\_\_\_\_ Volt-Pri \_\_\_\_\_ / \_\_\_\_\_ Volt-Sec  
\_\_\_\_\_ KVA \_\_\_\_\_ PH \_\_\_\_\_ Volt-Pri \_\_\_\_\_ / \_\_\_\_\_ Volt-Sec  
☐ Copper Windings ☐ Stainless Steel Enclosure

### Panelboards: (1A, N)

#### Power (480V) (D2D EXD)

☐ Single Phase ☐ Three Phase  
Main Breaker \_\_\_\_\_ Pole \_\_\_\_\_ AT  
Branch Circuits  
Qty \_\_\_\_\_ AT \_\_\_\_\_ No. Poles (i.e. '2P'-2 = Pole)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### LIGHTING/HEAT TRACING

(240/120V) (D2L, EPL, D2PB)

☐ Single Phase ☐ Three Phase  
Main Breaker \_\_\_\_\_ Pole \_\_\_\_\_ AT  
Branch Circuits  
Qty \_\_\_\_\_ (AT) \_\_\_\_\_ No. Poles (i.e. '2P'=2 Pole)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

‡ GFI (5mA) \_\_\_\_\_ AMP  
(No. Req'd) \_\_\_\_\_ Rating \_\_\_\_\_  
‡ EPD (30mA) \_\_\_\_\_ AMP  
(No. Req'd) \_\_\_\_\_ Rating \_\_\_\_\_



## Selection Guide

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 NEMA 3, 4X, 7BCD, 9EFG, 12 Watertight

**Lighting Contactor:**

☐ Yes ☐ No  
 No. Poles \_\_\_\_\_ Amp Rating \_\_\_\_\_  
☐ Control Power Transformer  
 Suffix FTFS  
☐ Hand-Off-Auto Selector Switch  
 Suffix RR3

**Photocell:**

☐ Yes ☐ No

**Lighting Fixtures:** (1L, 2L, 3L)

Quantity \_\_\_\_\_ Type \_\_\_\_\_  
 Wattage \_\_\_\_\_ Voltage \_\_\_\_\_

**Receptacles:**

☐ Convenience Receptacle  
 Amps \_\_\_\_\_ Poles \_\_\_\_\_ Volts \_\_\_\_\_  
☐ Welding Receptacle  
 Amps \_\_\_\_\_ Poles \_\_\_\_\_ Volts \_\_\_\_\_  
 Integral Circuit Breaker ☐ Yes ☐ No

**Conduit Fittings, Seals, Unions:**

Plant Standard \_\_\_\_\_ (i.e. "Form 7")  
☐ Iron ☐ Aluminum  
 Type Seals  
 (Note seals not poured at factory)  
☐ EYD ☐ EYS ☐ EZD  
☐ Other (specify) \_\_\_\_\_

**Conduit:**

☐ Rigid Galv. Steel ☐ Aluminum  
☐ PVC Coated

**Wiring:**

☐ RHW/RHH ☐ THWN/THHN (C-H Std)  
☐ THW ☐ XHHW  
☐ Other Insulation - Specify \_\_\_\_\_

**Shop Inspection & Tests:**

☐ Mfr. Standard Tests  
☐ Customer In Plant Final Inspection  
☐ Yes ☐ No

**Special Requirements:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

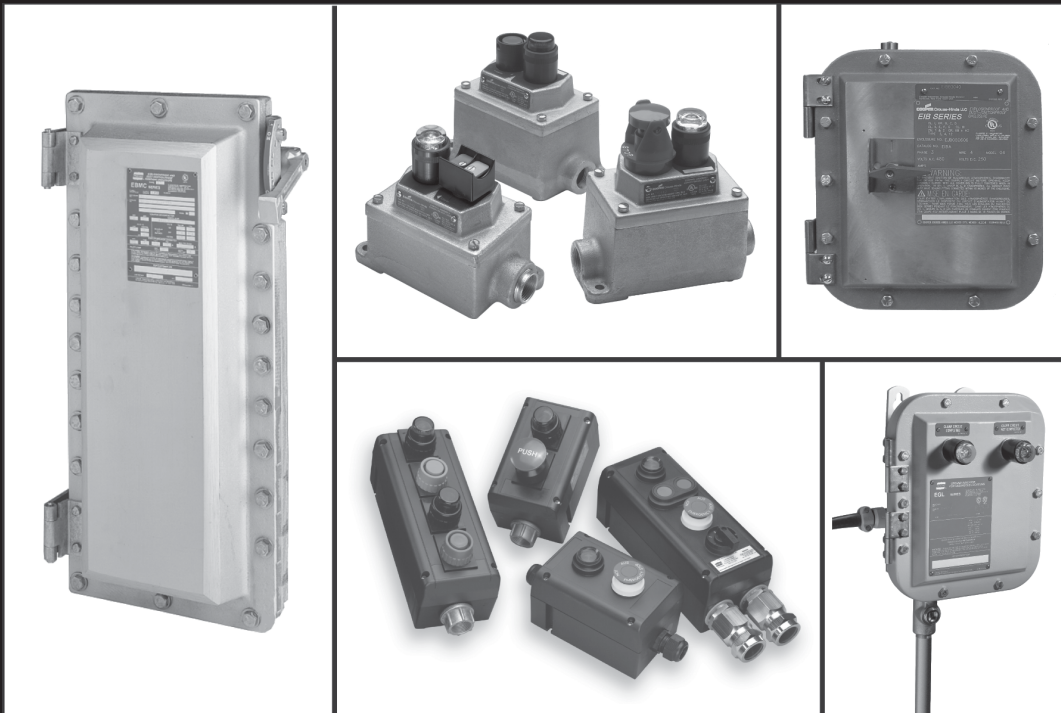
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\_\_\_\_\_

# ***Industrial Control & Circuit Breakers***

## ***Section C***

Innovative, intelligent NEC and IEC solutions safely and efficiently control power and protect circuits in explosive, wet, and corrosive environments worldwide.



### **New Products in the Control Product Line**

- EMN Series Pushbutton Style Compact Manual NEMA Starters
- EMN Series Pushbutton Style Compact Manual IEC Starters
- GUSC Enclosures with Manual Motor Starters
- XLC Explosionproof Lighting Contactors
- DSD-TS Series Timers
- ACE20 Series Explosionproof Variable Frequency Drives
- Engineered Solutions

### **Section**

- 2C
- 2C
- 2C
- 5C
- 5C
- 6C
- 7C

# C Industrial Control and Circuit Breakers

## Table of Contents

Section C of the Eaton's Crouse-Hinds Product Catalog lists motor control, circuit breakers, variable frequency drives, and engineered solutions and switch racks. Information on application, features, standard materials, standard finishes, size ranges, compliances, options, and accessories are presented for ease of product selection.

Information relating to product families in Section C is grouped as follows:

### Section 1C

#### Combination Motor Starters

(for hazardous and non-hazardous areas)

Combination magnetic line starters and enclosures for across-the-line motor starting, motor disconnect, motor and line protection, and start-stop operations.

For hazardous areas

EBMC  
EPC

For non-hazardous areas

NMC

### Section 2C

#### Motor Starters

(for hazardous and non-hazardous areas)

Line starters and enclosures for manual and magnetic across-the-line starting of motors, motor protection, and remote and manual starting and stopping.

Magnetic starters

EBMS  
EPC  
NMG

Manual starters

|     |      |
|-----|------|
| EFD | GHG  |
| EDS | NSSC |
| EMN | NFSC |
| MC  | NMN  |
| EMN | GUSC |

### Section 3C

#### Circuit Breakers

(for hazardous and non-hazardous areas)

For use in conjunction with a variety of heating, lighting, and power circuits to provide disconnect means and short circuit protection.

For hazardous areas

EBMB  
EFD  
EPC  
EIB  
FLB

For non-hazardous areas

NCB

### Section 4C

#### Traditional Control Stations

(for hazardous and non-hazardous areas)

For means of remote and local motor control, visual indicators and circuit control and selection. Offers a selection of pushbuttons, pilot lights, and selector switches.

For hazardous areas

|              |              |
|--------------|--------------|
| FlexStation  | GHG43        |
| EDS / EDSC   | N2SU / N2SCU |
| EDSCM        | N2FA / N2FAC |
| DSD / DSD-SR | N2S / N2SC   |
| EDS          |              |
| EFS          |              |
| MC / MCC     |              |
| OAC          |              |

For non-hazardous areas

MC

### Section 5C

#### Specialty Control Stations

(for hazardous and non-hazardous areas)

For means of remote and local motor control, visual indicators and circuit control and selection. Offers a selection of push buttons, pilot lights, selector switches.

EJB Custom Control Panels

EMP / EMPS

EGL

AFU / AFUX

AFA / AFAX

D2X

EGF

XLC

DSD-TS

### Section 6C

#### Explosionproof Variable Frequency Drives

(for hazardous areas)

Highly flexible AC drives designed specifically for hazardous area locations. These drives can be mounted next to the motor in the classified area, providing significant installation cost savings - along with the traditional VFD benefits of energy savings, speed and torque control, and system diagnostics.

ACE

### Section 7C

#### Engineered Solutions

(for hazardous and non-hazardous areas)

For motor control centers in outdoor and/or hazardous areas.

For hazardous areas

ERK  
DRK

For non-hazardous areas

WRK

| Description                                                              | Page No.     |
|--------------------------------------------------------------------------|--------------|
| Application/Selection                                                    | see page 446 |
| Combination Line Starters and Enclosures                                 |              |
| Single speed, non-reversing, with circuit breakers & disconnect switches |              |
| EBMC Series                                                              | see page 447 |
| EPC Series                                                               | see page 454 |
| NMC Nonmetallic Series                                                   | see page 458 |
| Single speed, non-reversing, with motor circuit protectors               |              |
| EBMC Series                                                              | see page 453 |
| EPC Series                                                               | see page 457 |



# 1C Combination Motor Starters

## Application and Quick Selector Chart

### Applications:

Combination line starters are housed in enclosures suitable for specific environments, and are used for:

- Across-the-line starting of polyphase AC induction motors
- Providing disconnect means
- Branch circuit protection
- Motor running protection
- Remote starting and stopping

### Considerations for Selection:

Considerations for selection of proper enclosure:

- The environment of the enclosure location in accordance with NEC/CEC and NEMA/EEMAC requirements
- The characteristics of the starter and breaker to be enclosed
- See "Quick-Selector" below for guidance

### Materials and Finishes:

- Standard material on EBMC and EPC Series is copper-free aluminum with natural finish
- EBMC and EPC optional finish is *Corro-free*™ epoxy for use in exceptionally corrosive atmospheres
- Standard material on NMC Series is Krydon® high impact fiberglass-reinforced polyester, providing excellent corrosion resistance and stability to heat

### Options and Accessories:

Some of the options and accessories available for particular applications are:

- Push buttons
- Selector switches
- Control transformers
- Extra overload relays
- Extra interlock contacts
- Neutral connectors (both insulated and grounded)
- Breathers and drains

See individual listings for specific options. Many are available in kit form for field addition to existing units.

### Quick Selector Chart

| Enclosures for Combination Motor Starters |                                                                                                               |                              |                               |                                                    |                                   |                                 |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|----------------------------------------------------|-----------------------------------|---------------------------------|
|                                           |                                                                                                               |                              | NEMA/<br>EEMAC<br>Starters    | Manufacturers Equipment Enclosed                   |                                   |                                 |
| Enclosures                                | NEC/CEC – Hazardous Area<br>Certifications and Compliance                                                     | NEMA/EEMAC<br>Enclosure Type | Single Speed<br>Non-Reversing | Starter                                            | Breaker/Switch                    | Cover Type                      |
| EBMC                                      | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 4*, 7BCD,<br>9EFG, 12     | 0 – 5                         | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer | G.E.<br>Square D<br>Cutler-Hammer | Bolted/Ground<br>Joint/Gasketed |
| EPC                                       | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III    | 3, 4, 7CD,<br>9EFG, 12       | 0 – 3                         | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer | G.E.<br>Square D<br>Cutler-Hammer | Threaded                        |
| NMC                                       | —                                                                                                             | 3, 4X, 12                    | 0 – 4                         | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer | G.E.<br>Square D<br>Cutler-Hammer | Gasketed                        |

\*Without EMP control devices

# EBMC Combination Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

1C

## Applications:

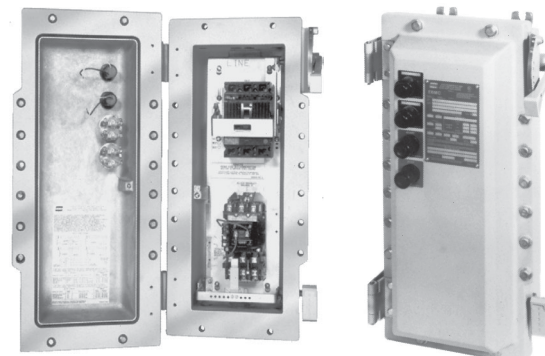
Spectrum™ EBM hinged cover motor control enclosures are used:

- For general motor control and circuit protection – indoors and outdoors – in damp, wet, dirty, dusty hazardous locations without the need for a protective shelter
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent
- For across-the-line starting, stopping, speed changing and reversing of polyphase AC induction motors
- To provide line disconnect means and short circuit protection
- To provide motor overload and undervoltage protection
- For service entrance, feeder or branch circuit protection for lighting, heating, appliance and motor circuits
- On switch racks or other assemblies where it's desired that motor control be centrally located

## Features:

- Rugged, corrosion resistant, cast copper-free aluminum construction (less than 0.4 of 1%)
- Component operating handles located through the right side wall of the body permits visual confirmation of correct component assembly and operation
- Total compliance to the wiring end room requirements of the National Electrical Code\*/Canadian Electrical Code
- Semi-clamshell enclosure design, with an external flanged ground joint between body and cover makes interior components more accessible
- Minimum enclosure-to-enclosure spacing with little interference between the opened cover and an adjacent enclosure
- Stainless steel hinges allow the cover to swing well out of the way
- Stainless steel, quick release, captive, hex head cover bolts. Stainless steel springs provide clear indication cover bolts are fully retracted from body
- Versatile, internal operating mechanisms allow for field adjustment to accommodate popular manufacturers' starters and breakers
- Simple, straightforward installation of breaker and starter on pre-drilled mounting plate within enclosure. Mounting plate also field removable.
- Circuit breaker motor circuit protector external operating handle can be padlocked in either "ON" or "OFF" positions
- Neoprene cover gasket permanently attached to the cover seals out moisture
- Bodies have top and bottom drilled and tapped entrances for power conduits plus one at the bottom for control conduit. Removable reducers are supplied, as standard, to accommodate smaller size conduits. All conduit entrances are plugged.
- Tap-on mounting feet
- Optional EMPS control devices may be added to enclosure cover
- Steel bracket for lifting larger enclosures during installation supplied as standard

\*National Electrical Code is a Registered Trademark of the National Fire Protection Association.



Interior components are readily accessible with ample end room for wiring

Side operators leave cover free for control options

## Certifications and Compliances:

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- UL Standards UL1203 – Hazardous (classified) locations
- UL Subject 2062 - High AIC rating (Interrupting Capacity) For Groups C & D only

| Volt | RMS Symm-Amperes |
|------|------------------|
| 240  | 65,000           |
| 480  | 50,000           |
| 600  | 25,000           |

- CSA Standard: C22.2 No. 30
- NEMA/EEMAC: 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shafts and bushings – stainless steel
- Cover bolts, hinges, washer and retractile springs – stainless steel
- Interior parts – sheet steel, electrogalvanized

## Electrical Rating Range:

- Motor starters – NEMA/EEMAC sizes 0-5
- Circuit breakers – 100, 150, 225, 250, 400, 600, 800, 1000† ampere frame sizes
- Motor circuit protectors – 150, 250, 400 ampere frame sizes

† 1000 Ampere Frame (max. 800 ampere trip)

Cl. I, Div. 1 &amp; 2, Groups B, C, D

Cl. II, Div. 1, Groups E, F, G

Cl. II, Div. 2, Groups F, G

Cl. III

NEMA 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

Explosionproof

Dust-Ignitionproof

Raintight

Wet Locations

Watertight

## Options:

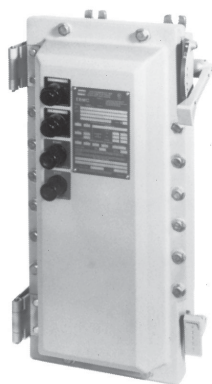
The following options are available from the factory by adding suffix to catalog number – suffixes are added alphanumerically.

### Catalog Number System Example

EBMC1FB-①-DT30FAL36-W643-②

① Options in this position are additions to the enclosure itself and should be listed alphanumerically.

② Options in this position are modifications to the starter and/or circuit breaker and should be listed alphanumerically.



**EBMC Series motor control enclosures with combination line starters.**

When specifying any one of the following options with Spectrum™ EBM Motor Controls (J1, J3, PB23, RR2, RR3) it is necessary to order DSL Legend Plates for identification and marking of the device(s) being used.

| Description                                                                                                                                                                                     | Position in Cat. # | Suffix                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------|
| • Ambient compensated circuit breaker trip setting ..... ②                                                                                                                                      |                    | <b>AC</b>                            |
| • Less overload relays (lighting contactor)..... ①                                                                                                                                              |                    | <b>CL</b>                            |
| • Less overload relays (motor contactor)..... ①                                                                                                                                                 |                    | <b>CM</b>                            |
| • Control Circuit Transformer, 100VA for NEMA/EEMAC sizes 0–2, 600/480/240–120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not provided) ..... ① |                    | <b>FTPS100</b>                       |
| • Control Circuit Transformer, 200VA for NEMA/EEMAC size 3, 600/480/240–120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not provided) ..... ①    |                    | <b>FTPS200</b>                       |
| • Control Circuit Transformer, 300VA for NEMA/EEMAC size 4, 5 600/480/240–120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not provided) ..... ①  |                    | <b>FTPS300</b>                       |
| • Pilot light, 120VAC, red jewel, w/blank indicating plate ..... ①                                                                                                                              |                    | <b>J1</b>                            |
| • Pilot light, 120VAC, green jewel, w/blank indicating plate ..... ①                                                                                                                            |                    | <b>J3</b>                            |
| • LED pilot lights (in place of standard incandescent lamps) ..... ①                                                                                                                            |                    | <b>LED</b>                           |
| • Less heaters in starter overload relay..... ②                                                                                                                                                 |                    | <b>0</b>                             |
| • Start-Stop pushbuttons (requires 2 spaces)..... ①                                                                                                                                             |                    | <b>PB23<math>\frac{1}{2}</math></b>  |
| • On-Off selector switch ..... ①                                                                                                                                                                |                    | <b>RR2<math>\frac{1}{2}</math></b>   |
| • Hand-Off-Auto selector switch ..... ①                                                                                                                                                         |                    | <b>RR3<math>\frac{1}{2}</math></b>   |
| • Space heater, 120 Volt, 25 Watts ..... ①                                                                                                                                                      |                    | <b>R11</b>                           |
| • Space heater, 240 Volt, 25 Watts ..... ①                                                                                                                                                      |                    | <b>R22</b>                           |
| • Space heater, 480 Volt, 25 Watts ..... ①                                                                                                                                                      |                    | <b>R44</b>                           |
| • Automatic reset overload relay ..... ①                                                                                                                                                        |                    | <b>S1</b>                            |
| • Insulated neutral w/2 connectors ..... ①                                                                                                                                                      |                    | <b>S146</b>                          |
| • Std. drain, Class I, B,C & D; Class II, E, F & G; Class III ..... ①                                                                                                                           |                    | <b>S756<math>\frac{1}{2}</math></b>  |
| • Std. breather & drain, Class I, B,C & D; Class II, E, F & G; Class III ..... ①                                                                                                                |                    | <b>S756V<math>\frac{1}{2}</math></b> |
| • External epoxy finish ..... ①                                                                                                                                                                 |                    | <b>S752</b>                          |
| • Internal and external epoxy finish ..... ①                                                                                                                                                    |                    | <b>S753</b>                          |
| • Additional control contacts, N.O. or N.C. – for single speed, non-reversing starters only (number limited by design of starter. Details on specific makes and sizes on request.)              |                    |                                      |
| Auxiliary contacts on starter 1 N.O. & 1 N.C..... ②                                                                                                                                             |                    | <b>S781</b>                          |
| Auxiliary contacts on starter 2 N.O. & 2 N.C..... ②                                                                                                                                             |                    | <b>S782</b>                          |
| Auxiliary contacts on starter 3 N.O. & 3 N.C..... ②                                                                                                                                             |                    | <b>S783</b>                          |
| • Auxiliary switch on Circuit Breaker 1A and 1B contacts ..... ②                                                                                                                                |                    | <b>S784</b>                          |
| • Auxiliary switch on Circuit Breaker 2A and 2B contacts ..... ②                                                                                                                                |                    | <b>S785</b>                          |
| • 12 Point term. block – 30 Amp, 300V..... ①                                                                                                                                                    |                    | <b>S786</b>                          |
| • General purpose control relay, 4 pole N.O., contacts rated 10A@600V, coil 120VAC, 50 / 60 hertz ..... ①                                                                                       |                    | <b>S787*</b>                         |

\*Use of this option with NEMA/EEMAC Size 0, or 1 starters necessitates using the larger "D" size enclosure.

$\frac{1}{2}$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators. Breather and drain entries must be plugged for NEMA 4 rating.

$\frac{1}{2}$ With S752 or S753.



# EBMC Combination Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

1C

## Options:

- If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below.
- Insert Legend Plate(s) Catalog Number (i.e. DSL16) immediately after optional device in the EBM Catalog Number.
- If EMP devices are to be added in the field, DSL Legend Plates must be ordered separately as they are not furnished with the EMP/EMPS devices.

## Example:

EBMC1FB-J1-DSL14-J3-DSL09-DT30FAL36-W643

Use the charts below to select the appropriate legend plate(s) for your application. Markings shown in **bold print** are etched; all others are stamped.

## Single Function Legend Plates

| Marking                 | Cat. # |
|-------------------------|--------|
| Automatic               | DSL16  |
| Blank                   | DSL01  |
| Blank with single field | DSL02  |
| <b>Close</b>            | DSL21  |
| <b>Down</b>             | DSL23  |
| <b>Emerg. Stop</b>      | DSL17  |
| Fast                    | DSL46  |
| Forward                 | DSL18  |
| Hand                    | DSL15  |
| In                      | DSL24  |
| Jog                     | DSL10  |
| Lower                   | DSL27  |
| <b>On</b>               | DSL07  |
| <b>Off</b>              | DSL08  |
| <b>Open</b>             | DSL20  |
| <b>Out</b>              | DSL25  |
| <b>Power On</b>         | DSL14  |
| Raise                   | DSL26  |
| Reset                   | DSL12  |
| Reverse                 | DSL19  |
| Run                     | DSL09  |
| <b>Safe</b>             | DSL85  |
| Slow                    | DSL47  |
| <b>Start</b>            | DSL05  |
| <b>Stop</b>             | DSL06  |
| <b>Test</b>             | DSL13  |
| Trip                    | DSL11  |
| <b>Up</b>               | DSL22  |

## Two Function Legend Plates

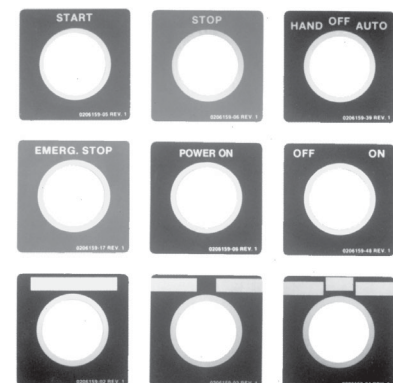
| Marking             | Cat. # |
|---------------------|--------|
| Blank with 2 fields | DSL03  |
| <b>For-Rev</b>      | DSL30  |
| Hand-Auto           | DSL29  |
| In-Out              | DSL35  |
| <b>Off-On</b>       | DSL48  |
| <b>Open-Close</b>   | DSL32  |
| Raise-Lower         | DSL36  |
| <b>Run-Jog</b>      | DSL28  |
| Safe-Run            | DSL86  |
| Start-Stop          | DSL37  |
| Slow-Fast           | DSL65  |
| <b>Up-Down</b>      | DSL33  |

## Three Function Legend Plates

| Marking               | Cat. # |
|-----------------------|--------|
| Auto-Off-Hand         | DSL49  |
| Blank with 3 fields   | DSL04  |
| Fast-Off-Slow         | DSL41  |
| <b>For-Off-Rev</b>    | DSL40  |
| <b>Hand-Off-Auto</b>  | DSL39  |
| <b>Run-Off-Jog</b>    | DSL38  |
| <b>Open-Off-Close</b> | DSL43  |
| Raise-Off-Lower       | DSL87  |
| Slow-Off-Fast         | DSL88  |
| Up-Off-Down           | DSL44  |
| 1-Off-2               | DSL42  |

Background color for all legend plates is black with the following exceptions:

| Marking     | Plate Color |
|-------------|-------------|
| Start       | Green       |
| Stop        | Red         |
| Emerg. Stop | Red         |



$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.  
 $\dagger\dagger$ With S752 or S753.

# 1C

## EBMC Combination Line Starters and Enclosures

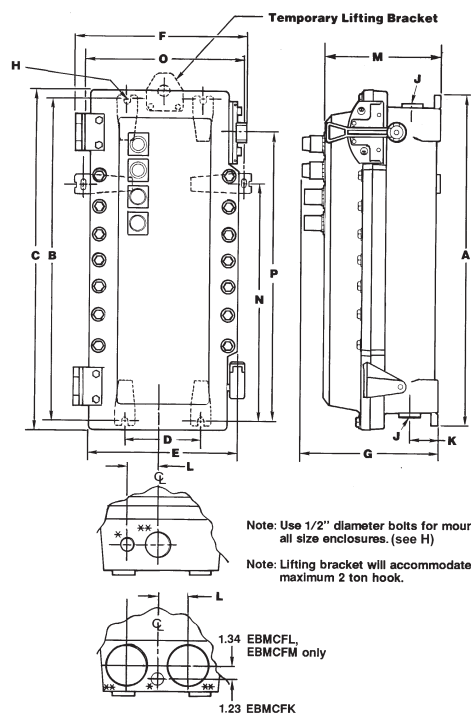
Dimensions (In inches)†

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4†, 4X††, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### Dimensions

In Inches:



\*1" Conduit entrance for control conductors (top & bottom).

\*\*Conduit entrance for power conductors (top & bottom). (All conduit entrances supplied with RE reducer and PLG plug.)

| Enclosure Only Cat. #                           | Enclosure Size Symbol | A     | B     | C     | D     | E     | F     | G     | J** Conduit Entry Trade Size D&TØ | w/RE     | K    | L    | M     | N     | O     | P     |
|-------------------------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-----------------------------------|----------|------|------|-------|-------|-------|-------|
| <b>Size 0, 1 FVNR combination line starter§</b> |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFB                                          | B                     | 25.75 | 24.75 | 26.90 | 6.00  | 13.03 | 14.78 | 12.13 | 2"                                | 1.5"     | 3.25 | 3.13 | 10.25 | —     | —     | 22.00 |
| <b>Size 2 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFD                                          | D                     | 28.25 | 27.25 | 29.40 | 6.00  | 13.03 | 14.67 | 12.13 | 3"                                | 2.5"     | 3.25 | 3.13 | 10.25 | —     | —     | 24.50 |
| <b>Size 3 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFG■                                         | G                     | 38.13 | 36.50 | 39.28 | 6.00  | 13.03 | 14.78 | 12.13 | 3"                                | 2.5"     | 3.25 | 3.13 | 10.25 | —     | —     | 34.06 |
| EBMCFH                                          | H                     | 37.50 | 36.50 | 38.65 | 6.00  | 14.65 | 16.65 | 13.54 | 3"                                | 2.5"     | 3.25 | 3.94 | 11.66 | —     | —     | 33.75 |
| <b>Size 4 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFK■                                         | K                     | 43.12 | 41.50 | 42.65 | 12.00 | 17.65 | 20.46 | 12.80 | (2) 3"                            | (2) 2.5" | 3.25 | 3.00 | 10.78 | —     | —     | 19.97 |
| EBMCFE                                          | L                     | 53.47 | 51.50 | 53.28 | 12.00 | 17.90 | 20.58 | 15.00 | (2) 4"                            | (2) 3.5" | 4.00 | 3.50 | 13.03 | 41.50 | 18.40 | 29.88 |
| <b>Size 5 FVNR combination line starter</b>     |                       |       |       |       |       |       |       |       |                                   |          |      |      |       |       |       |       |
| EBMCFM                                          | M                     | 64.22 | 62.50 | 64.03 | 12.00 | 17.90 | 21.08 | 15.00 | (2) 4"                            | (2) 3.5" | 4.00 | 3.50 | 13.03 | 41.50 | 18.40 | 34.46 |

†Dimensions are approximate, not for construction purposes.

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§Use EBMCFD enclosure when LVR1 or S787 options are ordered with Size 0 or 1 combination starters.

■For Cutler-Hammer W200 Advantage® starters.

⊙Drilled & Tapped.

# EBMC Combination Line Starters and Enclosures

## Single-Speed Non-Reversing with Circuit Breakers 3-Pole 60 hertz, 600VAC Maximum

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\pm$ , 4X $\pm$ ,  
7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**1C**

### Ordering Information:

To order an enclosure complete with starter and breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown in the footnotes see page 452.

Select the complete Cat. No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Instantaneous magnetic trip circuit breakers (magnetic circuit interrupters) can be supplied. Consult factory.

Enclosures only can be ordered. Select from listings below.

For Combination starters with motor circuit protectors for single speed, non-reversing motors see page 453.

| Motor Starter     |            |           | Circuit Breaker |             |             | Enclosure                        |                                 |
|-------------------|------------|-----------|-----------------|-------------|-------------|----------------------------------|---------------------------------|
| Max. HP Polyphase | Line Volts | NEMA Size | Amp Rating      | Frame Volts | Frame Types | Without Breaker & Starter Cat. # | With Breaker & Starter Cat. # § |
| 2                 | 120        | 0         | 30              | 240         | TEB         | EBMCFB                           | EBMC0FB ①30②32 ③613             |
| 2                 | 120        | 0         | 30              | 480         | TED, EHD    | EBMCFB                           | EBMC0FB ①30②34 ③613             |
| 2                 | 120        | 0         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①30②36 ③613             |
| 3                 | 240        | 0         | 20              | 240         | TEB         | EBMCFB                           | EBMC0FB ①20②32 ③623             |
| 3                 | 240        | 0         | 20              | 480         | TED, EHD    | EBMCFB                           | EBMC0FB ①20②34 ③623             |
| 3                 | 240        | 0         | 20              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①20②36 ③623             |
| 5                 | 480        | 0         | 15              | 480         | TED, EHD    | EBMCFB                           | EBMC0FB ①15②34 ③643             |
| 5                 | 480        | 0         | 15              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①15②36 ③643             |
| 5                 | 600        | 0         | 15              | 600         | TED, FDB    | EBMCFB                           | EBMC0FB ①15②36 ③663             |
| 5                 | 240        | 1         | 30              | 240         | TEB         | EBMCFB                           | EBMC1FB ①30②32 ③623             |
| 5                 | 240        | 1         | 30              | 480         | TED, EHD    | EBMCFB                           | EBMC1FB ①30②34 ③623             |
| 5                 | 240        | 1         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①30②36 ③623             |
| 7½                | 240        | 1         | 50              | 240         | TEB         | EBMCFB                           | EBMC1FB ①50②32 ③623             |
| 7½                | 240        | 1         | 50              | 480         | TED, EHD    | EBMCFB                           | EBMC1FB ①50②34 ③623             |
| 7½                | 240        | 1         | 50              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①50②36 ③623             |
| 10                | 480        | 1         | 30              | 480         | TED, EHD    | EBMCFB                           | EBMC1FB ①30②34 ③643             |
| 10                | 480        | 1         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①30②36 ③643             |
| 10                | 600        | 1         | 30              | 600         | TED, FDB    | EBMCFB                           | EBMC1FB ①30②36 ③663             |
| 10                | 240        | 2         | 50              | 240         | TEB         | EBMCFD                           | EBMC2FD ①50②32 ③623             |
| 10                | 240        | 2         | 50              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①50②34 ③623             |
| 10                | 240        | 2         | 50              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①50②36 ③623             |
| 15                | 240        | 2         | 70              | 240         | TEB         | EBMCFD                           | EBMC2FD ①70②32 ③623             |
| 15                | 240        | 2         | 70              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①70②34 ③623             |
| 15                | 240        | 2         | 70              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①70②36 ③623             |
| 15                | 480        | 2         | 40              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①40②34 ③643             |
| 15                | 480        | 2         | 40              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①40②36 ③643             |
| 15                | 600        | 2         | 40              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①40②36 ③663             |
| 20                | 480        | 2         | 50              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①50②34 ③643             |
| 20                | 480        | 2         | 50              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①50②36 ③643             |
| 20                | 600        | 2         | 50              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①50②36 ③663             |
| 25                | 480        | 2         | 70              | 480         | TED, EHD    | EBMCFD                           | EBMC2FD ①70②34 ③643             |
| 25                | 480        | 2         | 70              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①70②36 ③643             |
| 25                | 600        | 2         | 70              | 600         | TED, FDB    | EBMCFD                           | EBMC2FD ①70②36 ③663             |
| 20                | 240        | 3         | 90              | 240         | TEB         | EBMCFH                           | EBMC3FH ①90②32 ③623             |
| 25                | 240        | 3         | 100             | 240         | TEB         | EBMCFH                           | EBMC3FH ①100②32 ③623            |
| 30                | 240        | 3         | 125             | 480         | TED         | EBMCFH                           | EBMC3FH ①125②34 ③623            |
| 30                | 480        | 3         | 70              | 480         | TED, EHD    | EBMCFH                           | EBMC3FH ①70②34 ③643             |
| 30                | 480        | 3         | 70              | 600         | TED, FDB    | EBMCFH                           | EBMC3FH ①70②36 ③643             |
| 30                | 600        | 3         | 70              | 600         | TED, FDB    | EBMCFH                           | EBMC3FH ①70②36 ③663             |

①②③ See page 452 for configurable options.

To include a 120V coil, insert a "1" between second to last and last character in catalog number. 120V coil standard with FTFS option.  
Ex. EBMCFB-①30②32-③613 becomes EBMCFB-①30②32-③6113

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§Starters are furnished with 3 heaters, when heater ratings are fully specified.

**Crouse-Hinds**

by **E•T•N**

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# 1C EBMC Combination Line Starters and Enclosures

## Single-Speed Non-Reversing with Circuit Breakers and Fusible Disconnect Switches

### 3-Pole 60 hertz, 600VAC Maximum

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 3R, 4 $\pm$ , 4X $\pm$ , 7BCD,  
 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

| Motor Starter     |            |           | Circuit Breaker |             |                    | Enclosure                        |                                 |
|-------------------|------------|-----------|-----------------|-------------|--------------------|----------------------------------|---------------------------------|
| Max. HP Polyphase | Line Volts | NEMA Size | Amp Rating      | Frame Volts | Frame Types        | Without Breaker & Starter Cat. # | With Breaker & Starter Cat. # § |
| 40                | 480        | 3         | 90              | 480         | TED, EHD           | EBMCFH                           | EBMC3FH ①90②34 ③643             |
| 40                | 480        | 3         | 90              | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①90②36 ③643             |
| 40                | 600        | 3         | 90              | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①90②36 ③663             |
| 50                | 480        | 3         | 100             | 480         | TED, EHD           | EBMCFH                           | EBMC3FH ①100②34 ③643            |
| 50                | 480        | 3         | 100             | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①100②36 ③643            |
| 50                | 600        | 3         | 100             | 600         | TED, FDB           | EBMCFH                           | EBMC3FH ①100②36 ③663            |
| 40                | 240        | 4         | 175             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①175②36 ③623            |
| 50                | 240        | 4         | 200             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①200②36 ③623            |
| 60                | 480        | 4         | 125             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①125②36 ③643            |
| 60                | 600        | 4         | 100             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①100②36 ③663            |
| 75                | 480        | 4         | 150             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①150②36 ③643            |
| 75                | 600        | 4         | 125             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①125②36 ③663            |
| 100               | 480        | 4         | 200             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①200②36 ③643            |
| 100               | 600        | 4         | 150             | 600         | TFK / JD, TFJ, JDB | EBMCFL                           | EBMC4FL ①150②36 ③663            |
| 125               | 480        | 5         | 300             | 600         | TJK / KD, TJJ, KDB | EBMCFM                           | EBMC5FM ①300②36 ③643            |
| 150               | 480        | 5         | 400             | 600         | TJK / KD, TJJ, KDB | EBMCFM                           | EBMC5FM ①400②36 ③643            |

| Motor Starter     |                 |           | Fusible Disconnect Switch |            |             |                                         |
|-------------------|-----------------|-----------|---------------------------|------------|-------------|-----------------------------------------|
| Max. HP Polyphase | Max. Line Volts | NEMA Size | Amp Rating                | Max. Volts | Switch Type | With Disconnect Switch & Starter Cat. # |
| 5                 | 600             | 0         | 30                        | 600        | DS161R      | EBMC0FD WFD30J36 W643                   |
| 10                | 600             | 1         | 30                        | 600        | DS161R      | EBMC1FD WFD30J36 W643                   |
| 25                | 600             | 2         | 60                        | 600        | DS262R      | EBMC2FD WFD60J36 W643                   |
| 30                | 600             | 3         | 100                       | 600        | DS363R      | EBMC3FH WFD100J36 W643                  |

①Circuit Breakers:

| Manufacturer     | Symbol |
|------------------|--------|
| Cutler-Hammer    | WT     |
| General Electric | TT     |

NEMA

| Size | Without Switch & Starter Cat. # |
|------|---------------------------------|
| 0    | EBMCFD FD                       |
| 1    | EBMCFD FD                       |
| 2    | EBMCFD FD                       |
| 3    | EBMCFH FD                       |

②Select Circuit Breaker Frame Type based on Frame Size, Voltage, and Manufacturer desired:

| Manufacturer     | 100 Amp. Frame and 150 Amp. Frame |         |         | 225 Amp. Frame and 250 Amp. Frame                                      |                                                                        | 400 Amp. Frame |
|------------------|-----------------------------------|---------|---------|------------------------------------------------------------------------|------------------------------------------------------------------------|----------------|
|                  | 240V AC                           | 480V AC | 600V AC | 600VAC                                                                 | 600VAC                                                                 |                |
| Cutler-Hammer    | —                                 | EHD     | FDB     | JD – Interchangeable Trip Unit<br>JDB – Non-Interchangeable Trip Unit  | KD – Interchangeable Trip Unit<br>KDB – Non-Interchangeable Trip Unit  |                |
| General Electric | TEB                               | TED     | TED     | TFK – Interchangeable Trip Unit<br>TFJ – Non-Interchangeable Trip Unit | TJK – Interchangeable Trip Unit<br>TJJ – Non-Interchangeable Trip Unit |                |

③Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§Starters are furnished with 3 heaters, when heater ratings are fully specified.

**Crouse-Hinds**  
 by **E.T.N**

# EBMC Combination Line Starters

**Single-Speed Non-Reversing  
with Motor Circuit Protectors  
3-Pole 60 hertz, 600VAC Maximum**

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4†, 4X††,  
7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**1C**

## Ordering Information:

Select the complete Catalog No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motors or specify ampere rating of heaters.

### Motor Starter

| Max. HP<br>Polyphase | Volts | NEMA<br>Size | MCP<br>Amp<br>Rating | Enclosure<br>without Starter<br>& MCP Cat. # | Enclosure<br>with Starter<br>& MCP Cat. # § |
|----------------------|-------|--------------|----------------------|----------------------------------------------|---------------------------------------------|
| 3                    | 240   | 0            | 15                   | EBMCFB                                       | EBMC0FB ①15A②36 ③623                        |
| 3                    | 480   | 0            | 7                    | EBMCFB                                       | EBMC0FB ①7A②36 ③643                         |
| 3                    | 600   | 0            | 7                    | EBMCFB                                       | EBMC0FB ①7A②36 ③663                         |
| 5                    | 480   | 0            | 15                   | EBMCFB                                       | EBMC0FB ①15A②36 ③643                        |
| 5                    | 600   | 0            | 15                   | EBMCFB                                       | EBMC0FB ①15A②36 ③663                        |
| 7½                   | 240   | 1            | 30                   | EBMCFB                                       | EBMC1FB ①30A②36 ③623                        |
| 7½                   | 480   | 1            | 15                   | EBMCFB                                       | EBMC1FB ①15A②36 ③643                        |
| 10                   | 480   | 1            | 30                   | EBMCFB                                       | EBMC1FB ①30A②36 ③643                        |
| 10                   | 600   | 1            | 15                   | EBMCFB                                       | EBMC1FB ①15A②36 ③663                        |
| 10                   | 240   | 2            | 50                   | EBMCFD                                       | EBMC2FD ①50A②36 ③623                        |
| 15                   | 240   | 2            | 100                  | EBMCFD                                       | EBMC2FD ①100A②36 ③623                       |
| 15                   | 480   | 2            | 30                   | EBMCFD                                       | EBMC2FD ①30A②36 ③643                        |
| 20                   | 600   | 2            | 30                   | EBMCFD                                       | EBMC2FD ①30A②36 ③663                        |
| 25                   | 480   | 2            | 50                   | EBMCFD                                       | EBMC2FD ①50A②36 ③643                        |
| 25                   | 600   | 2            | 50                   | EBMCFD                                       | EBMC2FD ①50A②36 ③663                        |
| 30                   | 240   | 3            | 100                  | EBMCFH                                       | EBMC3FH ①100A②36 ③623                       |
| 30                   | 600   | 3            | 50                   | EBMCFH                                       | EBMC3FH ①50A②36 ③663                        |
| 50                   | 480   | 3            | 100                  | EBMCFH                                       | EBMC3FH ①100A②36 ③643                       |
| 50                   | 600   | 3            | 100                  | EBMCFH                                       | EBMC3FH ①100A②36 ③663                       |
| 50                   | 240   | 4            | 250*                 | EBMCFL                                       | EBMC4FL ①250④236 ③623                       |
| 100                  | 480   | 4            | 250*                 | EBMCFL                                       | EBMC4FL ①250④236 ③643                       |
| 100                  | 600   | 4            | 250*                 | EBMCFL                                       | EBMC4FL ①250④236 ③663                       |
| 60                   | 240   | 5            | 250*                 | EBMCFM                                       | EBMC5FM ①250④236 ③623                       |
| 100                  | 240   | 5            | 400                  | EBMCFM                                       | EBMC5FM ①400④236 ③623                       |
| 125                  | 480   | 5            | 250*                 | EBMCFM                                       | EBMC5FM ①250④236 ③643                       |
| 150                  | 600   | 5            | 250*                 | EBMCFM                                       | EBMC5FM ①250④236 ③663                       |
| 200                  | 480   | 5            | 400                  | EBMCFM                                       | EBMC5FM ①400④236 ③643                       |
| 200                  | 600   | 5            | 400                  | EBMCFM                                       | EBMC5FM ①400④236 ③663                       |

### ①Motor Circuit Protectors:

| Manufacturer     | Symbol |
|------------------|--------|
| Cutler-Hammer    | WP     |
| General Electric | TP     |
| Square D         | DP     |

②Select Motor Circuit Protector Frame Type based on Frame Size and Manufacturer desired:

|                  | 150 Amp.<br>Frame | 250 Amp.<br>Frame | 400 Amp.<br>Frame |
|------------------|-------------------|-------------------|-------------------|
| Cutler-Hammer    | HMCP<br>(F-Frame) | HMCP<br>(J-Frame) | HMCP<br>(K-Frame) |
| General Electric | TEC               | TFC               | TJC               |
| Square D         | FAL               | KAL               | LAL               |

### ③Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

‡ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

\*General Electric motor circuit protectors are 225 Amp. Rated.

§Starters are furnished with three heaters when heater ratings are fully specified.

④After the MCP amp rating the following character symbol must be entered to designate the trip range. Consult factory for other trip ranges available.

| MCP Amp Rating               | Symbol | Trip Range   |
|------------------------------|--------|--------------|
| <b>Cutler-Hammer (WP)</b>    |        |              |
| 7                            | A      | 21 to 70     |
| 15                           | A      | 45 to 150    |
| 30                           | A      | 90 to 300    |
| 50                           | B      | 150 to 500   |
| 100                          | B      | 300 to 1000  |
| 250                          | J      | 1250 to 2500 |
| 400                          | G      | 1250 to 2500 |
| <b>General Electric (TP)</b> |        |              |
| 7                            | A      | 18 to 90     |
| 15                           | A      | 42 to 198    |
| 30                           | A      | 90 to 390    |
| 50                           | A      | 180 to 660   |
| 100                          | A      | 300 to 1308  |
| 225                          | B      | 1000 to 2250 |
| 400                          | C      | 1000 to 3300 |
| <b>Square D (DP)</b>         |        |              |
| 7                            | A      | 18 to 70     |
| 15                           | A      | 50 to 180    |
| 30                           | A      | 100 to 350   |
| 50                           | A      | 150 to 580   |
| 100                          | A      | 300 to 1100  |
| 250                          | H      | 1250 to 2500 |
| 400                          | E      | 1250 to 2500 |

**Crouse-Hinds**

by **E.T.N**

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## Applications:

EPC combination line starters and enclosures are used:

- For across-the-line starting of polyphase AC induction motors
- In locations which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- In damp, wet or corrosive locations
- For installation indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnecting means, motor branch circuit protection, motor running protection, undervoltage protection and remote starting and stopping due to the combination of thermal-magnetic circuit breaker and magnetic motor starter

## Features:

- Quick-opening covers – less than two turns to remove or install
- Three section design for ease of installation
- Water-shedding construction with female threads on top cover, male threads on bottom cover, and top cover skirted
- Specially located stops and locks insure adequate thread engagement and prevent overtightening
- Separate replaceable mounting bracket attached to the rear of the body provides three-point suspension for quick installation and leveling – one keyhole slot at top and two open slots at bottom
- Bodies have two taper-tapped conduit hubs with integral bushings on the top, and two more directly below
- Universal mounting plate and reset mechanism will accommodate any of the motor starters and circuit breakers in catalog listing
- When interior mounting plate is removed, feeder and branch circuit conductors are easily pulled into the wiring chamber. The interior assembly, with breaker and starter attached, is then replaced, final connections made, and covers assembled
- External handle, which operates breaker can be padlocked in either "ON" or "OFF" positions
- Breaker is trip-free of the handle, therefore it will open under short circuit or overload, even if the external handle is locked in the "ON" position
- Furnished with third overload relay as standard

## Certifications and Compliances:

- NEC/CEC  
Class I, Division 1 & 2, Groups C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA/EEMAC: 3, 4, 7CD, 9EFG, 12
- UL Standard: 698
- CSA Standards: C22.2 No. 30

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized with chromate finish

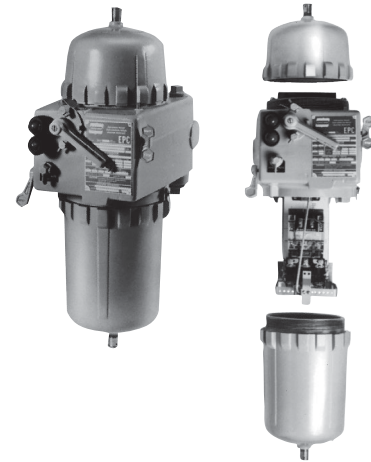
## Electrical Rating Range:

- Starters – Sizes 0, 1 and 3 inclusive
- Breakers – 100 and 150 ampere frame sizes
- Motor Circuit Protectors – 100 ampere frame size

## Options:

The following special options are available from factory by adding suffix to Cat. No. and many are available in kit form or for field addition to existing units: See page 471 for listing of kits

| Description                                                                                         | Suffix |
|-----------------------------------------------------------------------------------------------------|--------|
| Control circuit transformer<br>600/480/240–120 volts, 50 or<br>60 hertz (Sizes 0 and 1 – 100–50 VA) |        |
| Fusible – Secondary.....                                                                            | FT     |
| Fusible – Primary and secondary.....                                                                | FTPS   |
| Auxiliary Contacts on Starter or<br>Contactor*                                                      |        |
| 1 N.O./1 N.C. ....                                                                                  | S781   |
| 2 N.O./2 N.C. ....                                                                                  | S782   |
| 3 N.O./3 N.C. ....                                                                                  | S783   |
| Auxiliary Switch on Circuit Breaker or<br>Motor Circuit Protector*                                  |        |
| 1A/1B (1P2T) .....                                                                                  | S784   |
| 2A/2B (2P2T) .....                                                                                  | S785   |
| Side bosses drilled and tapped<br>same size as standard hubs<br>(except 15" dia. – 1" size).....    | S366   |
| Back boss drilled and tapped<br>same size as standard hubs<br>(except 15" dia. – 1" size).....      | S367   |
| Pushbuttons (heavy duty):<br>START-STOP .....                                                       | PB3    |



Assembled unit

Separated view  
showing major  
components

| Description                                                                                         | Suffix  |
|-----------------------------------------------------------------------------------------------------|---------|
| Selector switches (standard duty):                                                                  |         |
| ON-OFF .....                                                                                        | RR2     |
| HAND-OFF-AUTO .....                                                                                 | RR3     |
| Pilot lights:                                                                                       |         |
| Red, 120 volt .....                                                                                 | J1      |
| Green, 120 volt .....                                                                               | J3      |
| LED pilot lights, in place of standard<br>incandescent lamps.....                                   | LED     |
| Pilot light transformers:                                                                           |         |
| 240 volt† .....                                                                                     | T2      |
| 480 volt† .....                                                                                     | T4      |
| 600 volt† .....                                                                                     | T5      |
| Space heaters:                                                                                      |         |
| 120 volt .....                                                                                      | R11     |
| 240 volt .....                                                                                      | R22     |
| 480 volt .....                                                                                      | R44     |
| Automatic reset overload relay .....                                                                | S1      |
| Less overload relays (lighting<br>contactor).....                                                   | CL      |
| Less overload relays (motor contactor)                                                              | CM      |
| Separate AC control circuit .....                                                                   | Specify |
| Insulated neutral with 2 connectors<br>(50, 100 & 225 amp) .....                                    | S146    |
| Grounded neutral stud with 3<br>connectors (50, 100 & 225 amp) .....                                | S178    |
| Pilot light holes drilled, tapped and<br>plugged for future addition of pilot<br>lights             |         |
| One hole.....                                                                                       | S541    |
| Two holes.....                                                                                      | S542    |
| Standard Breather (Class I, Groups C,<br>D, Class II, Groups E, F, G, Class III) ...                | S219    |
| Standard Drain (Class I, Groups C, D,<br>Class II, Groups E, F, G, Class III) .....                 | S198    |
| Standard Breather and Drain (Class I,<br>Groups C, D, Class II, Groups E, F, G,<br>Class III) ..... | S198V   |
| Universal Breather – Drain (Class I,<br>Groups C, D, Class II, Groups F, G) .....                   | S454‡   |
| (2) Universal Breather – Drains (Class I,<br>Groups C, D, Class II, Groups F, G) .....              | S454V‡  |
| Less heaters.....                                                                                   | 0       |

\*Application is limited by starter, contactor, circuit breaker or motor circuit protector design – Consult Factory

† Required for pilot lights on other than 120 volt control circuits. One required for each lamp.

‡ Not suitable for NEMA 4.

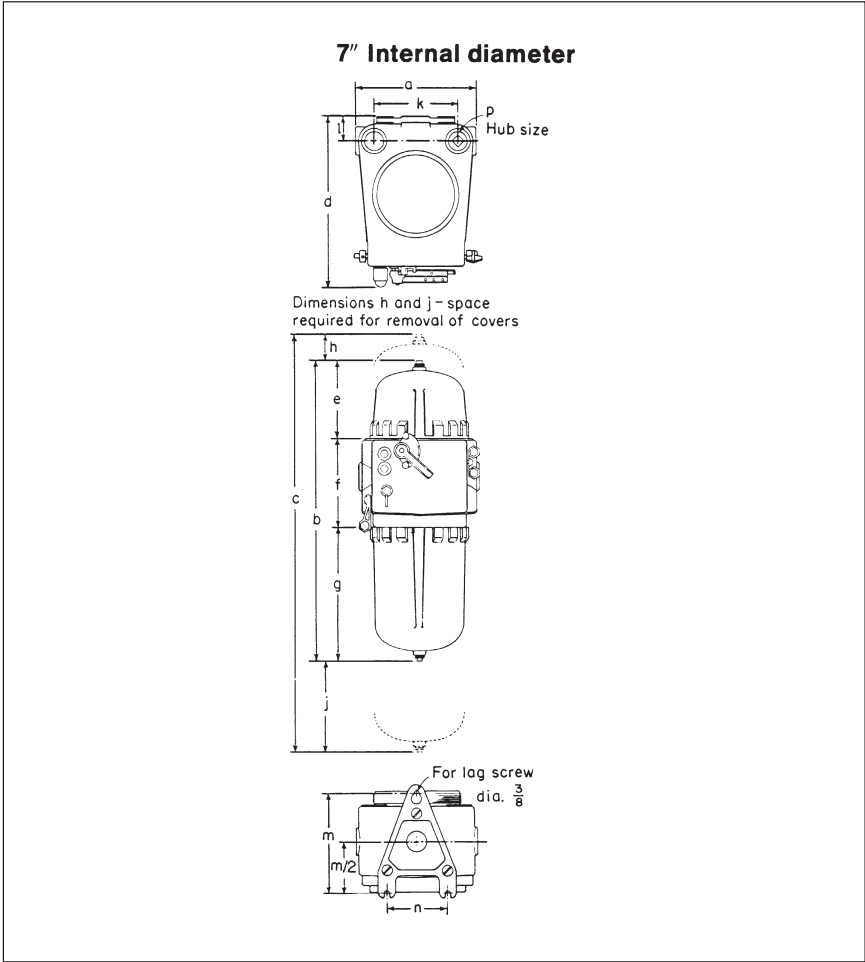
EPC Combination Line Starters and Enclosures

Dimensions\* (In Inches)

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

1C



1C

Single-Speed Non-Reversing Sizes 0, 1 and 3 starters

|           | EPC87                            | EPC87-FTPS or<br>EPC87-FT        |
|-----------|----------------------------------|----------------------------------|
| Int. Dia. | 7"                               | 7"                               |
|           | Dimensions                       | Dimensions†                      |
| a         | 10 <sup>5</sup> / <sub>8</sub>   | 10 <sup>5</sup> / <sub>8</sub>   |
| b         | 26 <sup>1</sup> / <sub>16</sub>  | 31 <sup>1</sup> / <sub>16</sub>  |
| c         | 35 <sup>11</sup> / <sub>16</sub> | 47 <sup>11</sup> / <sub>16</sub> |
| d         | 14 <sup>11</sup> / <sub>16</sub> | 14 <sup>11</sup> / <sub>16</sub> |
| e         | 6 <sup>3</sup> / <sub>4</sub>    | 11 <sup>3</sup> / <sub>4</sub>   |
| f         | 71 <sup>1</sup> / <sub>16</sub>  | 71 <sup>1</sup> / <sub>16</sub>  |
| g         | 11 <sup>5</sup> / <sub>8</sub>   | 11 <sup>5</sup> / <sub>8</sub>   |
| h         | 2                                | 9                                |
| j         | 7 <sup>5</sup> / <sub>8</sub>    | 7 <sup>5</sup> / <sub>8</sub>    |
| k         | 7 <sup>3</sup> / <sub>8</sub>    | 7 <sup>3</sup> / <sub>8</sub>    |
| l         | 2 <sup>1</sup> / <sub>16</sub>   | 2 <sup>1</sup> / <sub>16</sub>   |
| m         | 9 <sup>3</sup> / <sub>8</sub>    | 9 <sup>3</sup> / <sub>8</sub>    |
| n         | 5 <sup>1</sup> / <sub>4</sub>    | 5 <sup>1</sup> / <sub>4</sub>    |
| p         | 1 <sup>1</sup> / <sub>4</sub>    | 1 <sup>1</sup> / <sub>4</sub>    |

\*Dimensions are approximate, not for construction purposes.  
†For units with Control Circuit Transformer (suffix FT or FTPS).



# 1C

## EPC Combination Line Starters and Enclosures Single Speed, Non-Reversing with Circuit Breakers 3-Pole 60 hertz, 600 VAC Maximum

Cl. I, Div. 1 & 2, Groups C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 4, 7CD, 9EFG, 12 Watertight

### Ordering Information:

To order an enclosure complete with starter and breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown in the footnotes below.

Select the complete Cat. No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Enclosures only can be ordered. Select from listings below.

Instantaneous magnetic trip circuit breakers (magnetic circuit interrupters) can be supplied. Consult factory.

For combination starters with motor circuit protectors or single speed, non-reversing motors see page 457.

| Motor Starter     |       |           | Circuit Breaker |       | Enclosure    |               |       | Without Starter & Circuit Breaker Cat. # | With Starter & Circuit Breaker Cat. # § |
|-------------------|-------|-----------|-----------------|-------|--------------|---------------|-------|------------------------------------------|-----------------------------------------|
| Max. HP Polyphase | Volts | NEMA Size | Amp Rating      | Frame | Hub Size in. | Int. Dia. in. |       |                                          |                                         |
| 2                 | 120   | 0         | 30              | EB    | 1¼           | 7             | EPC87 | EPC870                                   | ①30ED ②613                              |
| 3                 | 240   | 0         | 20              | EHD   | 1¼           | 7             | EPC87 | EPC870                                   | ①20EHD ②623                             |
| 3                 | 480   | 0         | 15              | EHD   | 1¼           | 7             | EPC87 | EPC870                                   | ①15EHD ②643                             |
| 3                 | 480   | 0         | 15              | FDB   | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②643                              |
| 3                 | 600   | 0         | 15              | FD    | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②653                              |
| 5                 | 240   | 1         | 30              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①30EHD ②623                             |
| 5                 | 480   | 0         | 15              | EHD   | 1¼           | 7             | EPC87 | EPC870                                   | ①15EHD ②643                             |
| 5                 | 480   | 0         | 15              | FDB   | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②643                              |
| 5                 | 600   | 0         | 15              | FDB   | 1¼           | 7             | EPC87 | EPC870                                   | ①15FD ②653                              |
| 7½                | 240   | 1         | 50              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①50EHD ②623                             |
| 7½                | 480   | 1         | 30              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①30EHD ②643                             |
| 7½                | 480   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②643                              |
| 7½                | 600   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②653                              |
| 10                | 480   | 1         | 30              | EHD   | 1¼           | 7             | EPC87 | EPC871                                   | ①30EHD ②643                             |
| 10                | 480   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②643                              |
| 10                | 600   | 1         | 30              | FDB   | 1¼           | 7             | EPC87 | EPC871                                   | ①30FD ②653                              |

①Circuit Breakers:

| Manufacturer     | Symbol | Frames 100/150AMP |      |         |
|------------------|--------|-------------------|------|---------|
|                  |        | 240V              | 480V | 600V    |
| General Electric | TT     | TEB               | TED* | TED*    |
| Cutler-Hammer    | WT     | EHD               | EHD  | FB, FDB |

\*Specify Voltage

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

§ Starters are furnished with three heaters when heater ratings are fully specified.

# EPC Combination Line Starters

**Single-Speed Non-Reversing  
with Motor Circuit Protectors  
3-Pole 60 hertz, 600 VAC Maximum**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**1C**

## Ordering Information:

Select the complete Catalog No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motors or specify ampere rating of heaters.

Current limiters may be ordered by specification\*.

| Motor Starter        |       |              | Enclosure with Motor Circuit Protector and Starter § |                            |
|----------------------|-------|--------------|------------------------------------------------------|----------------------------|
| Max. HP<br>Polyphase | Volts | NEMA<br>Size | Amp<br>Rating                                        | Cat. #                     |
| 3                    | 240   | 0            | 15                                                   | <b>EPC870 ①15HMCP ②623</b> |
| 3                    | 480   | 0            | 7                                                    | <b>EPC870 ①7HMCP ②643</b>  |
| 3                    | 600   | 0            | 7                                                    | <b>EPC870 ①7HMCP ②653</b>  |
| 5                    | 480   | 0            | 15                                                   | <b>EPC870 ①15HMCP ②643</b> |
| 5                    | 600   | 0            | 15                                                   | <b>EPC870 ①15HMCP ②653</b> |
| 7½                   | 240   | 1            | 30                                                   | <b>EPC871 ①30HMCP ②623</b> |
| 7½                   | 480   | 1            | 15                                                   | <b>EPC871 ①15HMCP ②643</b> |
| 10                   | 600   | 1            | 15                                                   | <b>EPC871 ①15HMCP ②653</b> |
| 10                   | 480   | 1            | 30                                                   | <b>EPC871 ①30HMCP ②643</b> |

①Motor Circuit Protectors

| Manufacturer     | Symbol |
|------------------|--------|
| General Electric | TP     |
| Square D         | DP     |
| Cutler-Hammer    | WP     |

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

\*General Electric or Cutler-Hammer MCPs only.

§ Starters are furnished with three heaters when heater ratings are fully specified.

1C

# 1C NMC Combination Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Applications:

- NMC combination magnetic line starters are for use in across-the-line motor starting, motor disconnect, motor and line protection and start-stop operations.

## Features:

- Enclosures are made of Krydon® high impact strength fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat.
- Unitized, strong and durable enclosure construction provides longer service life for equipment.
- Provided with top and bottom mounting feet.
- Enclosure has hinged access door which opens 160° for easy wiring and maintenance. Three screws for door frame are hidden behind access door.
- Access door may be padlocked to prevent unauthorized access.

## Certifications and Compliances:

- NEMA/EEMAC: 3, 4X and 12

## Electrical Rating Ranges:

- 3-pole, 60 hertz, 600 VAC max.
- Starters – sizes 0, 1, 2, 3, 4
- Breakers – 100, 150, 225 and 250 amp frame
- Switches – 30, 60, 100 amp
- Motor circuit protectors – 15, 30, 50, 100, 150 amp



Combination line starter with optional START-STOP pushbuttons – open view



Combination line starter with optional START-STOP pushbuttons – closed view

## Options:

| Description                                                                                                                                       | Suffix |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Control circuit transformer<br>480/240-120 volts, 50 or<br>60 hertz, (Sizes 0 and 1 – 50VA,<br>Size 2 – 100VA, Size 3 – 150VA,<br>Size 4 – 300VA) |        |
| Fusible                                                                                                                                           |        |
| Secondary.....                                                                                                                                    | FT     |
| Primary and secondary.....                                                                                                                        | FTPS   |
| Auxiliary Contact on Starter<br>or Contactor*                                                                                                     |        |
| 1NO/1NC.....                                                                                                                                      | S781   |
| 2 NO/2 NC.....                                                                                                                                    | S782   |
| 3 NO/3 NC.....                                                                                                                                    | S783   |
| Auxiliary Switch on Circuit<br>Breaker or Motor<br>Circuit Protector*                                                                             |        |
| 1A/1B .....                                                                                                                                       | S784   |
| 2A/2B .....                                                                                                                                       | S785   |
| Time delay low voltage release<br>for 3-wire control with 2, 4 or 6-<br>second adjustment. For single-<br>speed, non-reversing starters only.     |        |
| Control circuit voltage:                                                                                                                          |        |
| 120 volt, 60 hertz.....                                                                                                                           | LVR1†  |
| 240 volt, 60 hertz.....                                                                                                                           | LVR2†  |
| 480 volt, 60 hertz.....                                                                                                                           | LVR4†  |

| Description                                                                                             | Suffix  |
|---------------------------------------------------------------------------------------------------------|---------|
| Pilot lights, 120 V primary –<br>specify other primary voltages<br>as required:                         |         |
| Red pilot light.....                                                                                    | J1      |
| Green pilot light.....                                                                                  | J3      |
| LED pilot lights in place of<br>standard incandescent pilot lamps                                       | LED     |
| Pushbutton (heavy duty,<br>uses two device holes):                                                      |         |
| START-STOP.....                                                                                         | PB13    |
| Selector Switch (heavy duty)                                                                            |         |
| ON-OFF.....                                                                                             | RR17    |
| HAND-OFF-AUTO.....                                                                                      | RR18    |
| JOG-RUN-OFF.....                                                                                        | RR19    |
| Padlock attachment for:                                                                                 |         |
| Pushbutton.....                                                                                         | S708    |
| Automatic reset overload relay.....                                                                     | S1      |
| Less overload relays (contactor).....                                                                   | C       |
| Separate AC control circuit.....                                                                        | Specify |
| Insulated, groundable type terminal<br>block for grounded or ungrounded<br>neutral can be supplied..... | S618    |
| Hubs (see "NOTE ON HUBS") –<br>see page 677                                                             |         |
| Grounding plate or bushing –<br>see page 677                                                            |         |

\*Application limited by Size 5 starter, contactor or circuit breaker design – consult factory.  
†Option not available on NMC1024B.

**NOTE ON HUBS:** The following number and sizes of hubs (not mounted) are included when combination starters are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Starter Size | Number Included | Hub Size     |
|--------------|-----------------|--------------|
| 0            | 3               | 3/4          |
| 1            | 1<br>2          | 3/4<br>1     |
| 2            | 1<br>2          | 3/4<br>1 1/2 |
| 3            | 1<br>2          | 3/4<br>2     |
| 4            | 1<br>2          | 3/4<br>2 1/2 |

**Crouse-Hinds**  
by **Eaton**

# NMC Combination Line Starters and Enclosures

**Single-Speed, Non-Reversing  
600VAC Heavy Duty**

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

**1C**

## Ordering Information - With Circuit Breakers

To order an enclosure complete with starter and breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown in the footnotes.

Select the complete Cat. No. below and specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters. Starters are furnished with three heaters.

Enclosures only can be ordered. Select from listings below. Specific reference table is shown in the listings below. Instantaneous magnetic trip circuit breakers (magnetic circuit interrupters) can be supplied.

| Motor Starter     |             |           | Circuit Breaker   |       | Enclosure                             |                                          |
|-------------------|-------------|-----------|-------------------|-------|---------------------------------------|------------------------------------------|
| Max. HP Polyphase | Volts (A-C) | NEMA Size | Trip Setting Amps | Frame | With Starter & Circuit Breaker Cat. # | Without Starter & Circuit Breaker Cat. # |
| 2                 | 120         | 0         | 30                | EB    | NMC1024B ①30EB ②6130                  | NMC1024B                                 |
| 2                 | 240         | 0         | 15                | EB    | NMC1024B ①15EB ②6230                  | NMC1024B                                 |
| 3                 | 240         | 0         | 20                | EB    | NMC1024B ①20EB ②6230                  | NMC1024B                                 |
| 5                 | 240         | 1         | 30                | EB    | NMC1024B ①30EB ②6231                  | NMC1024B                                 |
| 5                 | 480         | 0         | 15                | EHD   | NMC1024B ①15EBH ②6430                 | NMC1024B                                 |
| 5                 | 600         | 0         | 15                | FDB   | NMC1024B ①15FB ②6530                  | NMC1024B                                 |
| 7½                | 240         | 1         | 50                | EB    | NMC1024B ①50EB ②6231                  | NMC1024B                                 |
| 7½                | 480         | 1         | 20                | EHD   | NMC1024B ①20EBH ②6431                 | NMC1024B                                 |
| 7½                | 600         | 1         | 20                | FDB   | NMC1024B ①20FB ②6531                  | NMC1024B                                 |
| 10                | 240         | 2         | 60                | EB    | NMC1024B2 ①60EB ②6232                 | NMC1024B2                                |
| 10                | 480         | 1         | 30                | EHD   | NMC1024B ①30EBH ②6431                 | NMC1024B                                 |
| 10                | 600         | 1         | 30                | FDB   | NMC1024B ①30FB ②6531                  | NMC1024B                                 |
| 15                | 240         | 2         | 80                | EB    | NMC1024B2 ①80EB ②6232                 | NMC1024B2                                |
| 15                | 480         | 2         | 40                | EHD   | NMC1024B2 ①40EBH ②6432                | NMC1024B2                                |
| 15                | 600         | 1         | 40                | FDB   | NMC1024B ①40FB ②6531                  | NMC1024B                                 |
| 20                | 240         | 3         | 80                | EB    | NMC1426B ①80EB ②6233                  | NMC1426B                                 |
| 20                | 480         | 2         | 60                | EHD   | NMC1024B2 ①60EBH ②6432                | NMC1024B2                                |
| 20                | 600         | 2         | 50                | FDB   | NMC1024B2 ①50FB ②6532                 | NMC1024B2                                |
| 25                | 240         | 3         | 80                | EB    | NMC1426B ①80EB ②6233                  | NMC1426B                                 |
| 25                | 480         | 2         | 70                | EHD   | NMC1024B2 ①70EBH ②6432                | NMC1024B2                                |
| 25                | 600         | 2         | 60                | FDB   | NMC1024B2 ①60FB ②6532                 | NMC1024B2                                |
| 30                | 240         | 4         | 125               | JDB‡  | NMC2426B ①125JB ②6234                 | NMC2426B                                 |
| 30                | 480         | 3         | 80                | EHD   | NMC1426B ①80EBH ②6433                 | NMC1426B                                 |
| 30                | 600         | 3         | 60                | FDB   | NMC1426B ①60FB ②6533                  | NMC1426B                                 |
| 40                | 240         | 4         | 150               | JDB‡  | NMC2426B ①150JB ②6234                 | NMC2426B                                 |
| 40                | 480         | 3         | 80                | EHD   | NMC1426B ①80EBH ②6433                 | NMC1426B                                 |
| 40                | 600         | 3         | 80                | FDB   | NMC1426B ①80FB ②6533                  | NMC1426B                                 |
| 50                | 240         | 4         | 200               | JDB‡  | NMC2426B ①200JB ②6234                 | NMC2426B                                 |
| 50                | 480         | 3         | 100               | EHD   | NMC1426B ①100EBH ②6433                | NMC1426B                                 |
| 50                | 600         | 3         | 100               | FDB   | NMC1426B ①100FB ②6533                 | NMC1426B                                 |
| 60                | 480         | 4         | 125               | JDB‡  | NMC2426B ①125JB ②6434                 | NMC2426B                                 |
| 60                | 600         | 4         | 100               | JDB‡  | NMC2426B ①100JB ②6534                 | NMC2426B                                 |
| 75                | 480         | 4         | 150               | JDB‡  | NMC2426B ①150JB ②6434                 | NMC2426B                                 |
| 75                | 600         | 4         | 125               | JDB‡  | NMC2426B ①125JB ②6534                 | NMC2426B                                 |
| 100               | 480         | 4         | 175               | JDB‡  | NMC2426B ①175JB ②6434                 | NMC2426B                                 |
| 100               | 600         | 4         | 150               | JDB‡  | NMC2426B ①150JB ②6534                 | NMC2426B                                 |

①Circuit Breakers:

| Manufacturer     | Symbol | Frames           |          |         |                  |
|------------------|--------|------------------|----------|---------|------------------|
|                  |        | 100/150A<br>240V | 480V     | 600V    | 225/250A<br>600V |
| General Electric | TT     | TEB              | TED§     | TED§    | TFJ              |
| Square D         | DT     | FAL§             | FAL§     | FAL§    | KAL              |
| Cutler-Hammer    | WT     | EB               | EBH, EHD | FB, FDB | JB, JDB          |

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |
| Cutler-Hammer    | W      |

Information on other starter manufacturers on request.

**NOTE ON HUBS:** See page 458.

§Specify voltage.

‡Formerly "JB"

**Crouse-Hinds**

by **E•T•N**

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## 1C

# NMC Combination Line Starters and Enclosures

Single-Speed, Non-Reversing  
600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Ordering Information - With Motor Circuit Protector

| Motor Starter        |               |              | Enclosure                |                               |                                 |
|----------------------|---------------|--------------|--------------------------|-------------------------------|---------------------------------|
| Max. HP<br>Polyphase | Volts<br>(AC) | NEMA<br>Size | MCP Trip<br>Setting Amps | With Starter &<br>MCP Cat. #§ | Without Starter &<br>MCP Cat. # |
| 3                    | 240           | 0            | 15                       | NMC1024B ①15MCP ②6230         | NMC1024B                        |
| 5                    | 480           | 0            | 15                       | NMC1024B ①15MCP ②6430         | NMC1024B                        |
| 5                    | 600           | 0            | 15                       | NMC1024B ①15MCP ②6530         | NMC1024B                        |
| 7½                   | 240           | 1            | 30                       | NMC1024B ①30MCP ②6231         | NMC1024B                        |
| 10                   | 480           | 1            | 30                       | NMC1024B ①30MCP ②6431         | NMC1024B                        |
| 10                   | 600           | 1            | 30                       | NMC1024B ①30MCP ②6531         | NMC1024B                        |
| 15                   | 240           | 2            | 50                       | NMC1024B2 ①50MCP ②6232        | NMC1024B2                       |
| 25                   | 480           | 2            | 50                       | NMC1024B2 ①50MCP ②6432        | NMC1024B2                       |
| 25                   | 600           | 2            | 50                       | NMC1024B2 ①50MCP ②6532        | NMC1024B2                       |
| 30                   | 240           | 3            | 100                      | NMC1426B ①100MCP ②6233        | NMC1426B                        |
| 50                   | 480           | 3            | 100                      | NMC1426B ①100MCP ②6433        | NMC1426B                        |
| 50                   | 600           | 3            | 100                      | NMC1426B ①100MCP ②6533        | NMC1426B                        |
| 50                   | 240           | 4            | 150                      | NMC2426P ①150MCP ②6234        | NMC2426P                        |
| 100                  | 480           | 4            | 150                      | NMC2426P ①150MCP ②6434        | NMC2426P                        |
| 100                  | 600           | 4            | 150                      | NMC2426P ①150MCP ②6534        | NMC2426P                        |

①Motor Circuit Protectors:

| Manufacturer     | Symbol |
|------------------|--------|
| General Electric | G      |
| Cutler-Hammer    | W      |

**NOTE ON HUBS:** See page 458.

§ With motor circuit protector only. For motor circuit protector with current limiter – information on request.

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

Information on other starter manufacturers on request.

## Ordering Information - With Non-fusible Disconnect Switch

To order an enclosure complete with disconnect switch, insert the manufacturer's symbol in the designated positions of the catalog number. Symbols are shown in the footnotes.

Enclosures only can be ordered. Select from listings below.

| Motor Starter        |               |              | Non-fusible<br>Disconnect<br>Switch | Enclosure                                  |                                               |
|----------------------|---------------|--------------|-------------------------------------|--------------------------------------------|-----------------------------------------------|
| Max. HP<br>Polyphase | Volts<br>(AC) | NEMA<br>Size | Switch<br>Size-Amps                 | With Starter & Disconnect Switch<br>Cat. # | Without Starter & Disconnect Switch<br>Cat. # |
| 3                    | 240           | 0            | 30                                  | NMC1024D ①30 ②6230                         | NMC1024D ①                                    |
| 5                    | 480           | 0            | 30                                  | NMC1024D ①30 ②6430                         | NMC1024D ①                                    |
| 5                    | 600           | 0            | 30                                  | NMC1024D ①30 ②6530                         | NMC1024D ①                                    |
| 7½                   | 240           | 1            | 30                                  | NMC1024D ①30 ②6231                         | NMC1024D ①                                    |
| 10                   | 480           | 1            | 30                                  | NMC1024D ①30 ②6431                         | NMC1024D ①                                    |
| 10                   | 600           | 1            | 30                                  | NMC1024D ①30 ②6531                         | NMC1024D ①                                    |
| 15                   | 240           | 2            | 60                                  | NMC1426D ①60 ②6232                         | NMC1426D ①                                    |
| 25                   | 480           | 2            | 60                                  | NMC1426D ①60 ②6432                         | NMC1426D ①                                    |
| 25                   | 600           | 2            | 60                                  | NMC1426D ①60 ②6532                         | NMC1426D ①                                    |
| 30                   | 240           | 3            | 100                                 | NMC2426D ①100 ②6233                        | NMC2426D ①                                    |
| 50                   | 480           | 3            | 100                                 | NMC2426D ①100 ②6433                        | NMC2426D ①                                    |
| 50                   | 600           | 3            | 100                                 | NMC2426D ①100 ②6533                        | NMC2426D ①                                    |

①Disconnect Switches:

| Manufacturer     | Symbol | Switch Type |
|------------------|--------|-------------|
| General Electric | G      | Type QMW    |
| Square D         | D      | Class 9422  |
| Cutler-Hammer    | W      | Type DS     |

**NOTE ON HUBS:** See page 458.

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

Information on other starter manufacturers on request.

# NMC Combination Line Starters and Enclosures

Single-Speed, Non-Reversing  
600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

1C

## Ordering Information - With Fusible Disconnect Switch

| Motor Starter     |          |           | Fusible Disconnect Switch |                       | Enclosure                                |                                            |
|-------------------|----------|-----------|---------------------------|-----------------------|------------------------------------------|--------------------------------------------|
| Max. HP Polyphase | Volts AC | NEMA Size | Switch Size-Amps          | Fuse Clip Rating-Amps | With Starter & Disconnect Switch Cat. #■ | Without Starter & Disconnect Switch Cat. # |
| 3                 | 240      | 0         | 30                        | 30                    | NMC1024D ①3030 ②6230                     | NMC1024D ①                                 |
| 5                 | 480      | 0         | 30                        | 30                    | NMC1024D ①3030 ②6430                     | NMC1024D ①                                 |
| 5                 | 600      | 0         | 30                        | 30                    | NMC1024D ①3030 ②6530                     | NMC1024D ①                                 |
| 7½                | 240      | 1         | 30                        | 30                    | NMC1024D ①3030 ②6231                     | NMC1024D ①                                 |
| 7½                | 240      | 1         | 30                        | 60                    | NMC1024D ①3060 ②6231                     | NMC1024D ①                                 |
| 10                | 480      | 1         | 30                        | 30                    | NMC1024D ①3030 ②6431                     | NMC1024D ①                                 |
| 10                | 480      | 1         | 30                        | 60                    | NMC1024D ①3060 ②6431                     | NMC1024D ①                                 |
| 10                | 600      | 1         | 30                        | 30                    | NMC1024D ①3030 ②6531                     | NMC1024D ①                                 |
| 10                | 600      | 1         | 30                        | 60                    | NMC1024D ①3060 ②6531                     | NMC1024D ①                                 |
| 15                | 240      | 2         | 60                        | 60                    | NMC1426D ①6060 ②6232                     | NMC1426D ①                                 |
| 15                | 240      | 2         | 60                        | 100                   | NMC1426D ①6010 ②6232                     | NMC1426D ①                                 |
| 25                | 480      | 2         | 60                        | 60                    | NMC1426D ①6060 ②6432                     | NMC1426D ①                                 |
| 25                | 480      | 2         | 60                        | 100                   | NMC1426D ①6010 ②6432                     | NMC1426D ①                                 |
| 25                | 600      | 2         | 60                        | 60                    | NMC1426D ①6060 ②6532                     | NMC1426D ①                                 |
| 25                | 600      | 2         | 60                        | 100                   | NMC1426D ①6010 ②6532                     | NMC1426D ①                                 |
| 30                | 240      | 3         | 100                       | 100                   | NMC2426D ①1010 ②6233                     | NMC2426D ①                                 |
| 50                | 480      | 3         | 100                       | 100                   | NMC2426D ①1010 ②6433                     | NMC2426D ①                                 |
| 50                | 480      | 3         | 100                       | 200                   | NMC2426D ①1020 ②6433                     | NMC2426D ①                                 |
| 50                | 600      | 3         | 100                       | 100                   | NMC2426D ①1010 ②6533                     | NMC2426D ①                                 |

①Disconnect Switches:

| Manufacturer     | Switch Type | Symbol |
|------------------|-------------|--------|
| General Electric | Type QMW    | G      |
| Square D         | Class 9422  | D      |
| Cutler-Hammer    | Type DS     | W      |

**NOTE ON HUBS:** See page 458.

■ Fuse clips are arranged for Class H fuses and field modifiable for Class J fuses. For Class R fuses, consult Eaton's Crouse-Hinds.

②Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

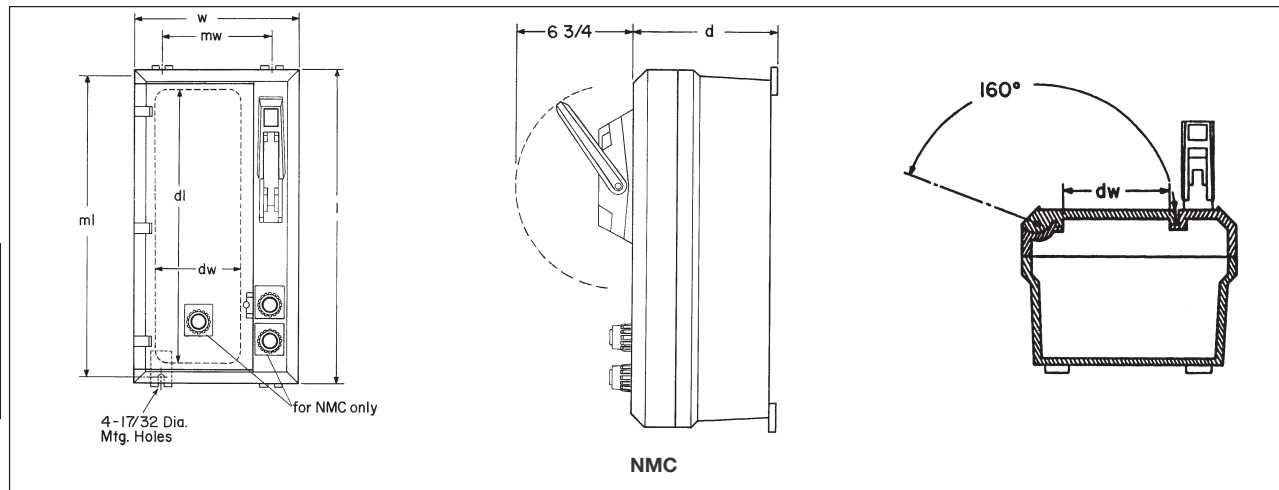
Information on other starter manufacturers on request.

1C

# 1C NMC Combination Line Starters and Enclosures

## Dimensions

In Inches:



| Cat. #         | Outside Dimensions |                   |                  | Mounting Dimensions |                 | Door Opening Dimensions |                   |
|----------------|--------------------|-------------------|------------------|---------------------|-----------------|-------------------------|-------------------|
|                | $l$                | $w$               | $d$              | $mw$                | $ml$            | $dl$                    | $dw$              |
| <b>NMC1024</b> | $25\frac{13}{32}$  | $11\frac{13}{32}$ | $8\frac{23}{32}$ | $7\frac{1}{8}$      | $25\frac{3}{8}$ | $22\frac{7}{8}$         | $5\frac{11}{16}$  |
| <b>NMC1426</b> | $27\frac{13}{32}$  | $15\frac{13}{32}$ | $9\frac{23}{32}$ | $11\frac{7}{8}$     | $27\frac{1}{4}$ | $23\frac{11}{16}$       | $9\frac{11}{16}$  |
| <b>NMC2426</b> | $27\frac{13}{32}$  | $25\frac{13}{32}$ | $9\frac{23}{32}$ | $21\frac{3}{4}$     | $27\frac{1}{4}$ | $23\frac{11}{16}$       | $19\frac{11}{16}$ |



| Description                                 | Page No.          |
|---------------------------------------------|-------------------|
| Application/Selection                       | see page 464      |
| Magnetic Line Starters & Enclosures         |                   |
| Single speed, non-reversing                 |                   |
| EBMS Series                                 | see pages 465–466 |
| EPC Series                                  | see pages 469–470 |
| NMG Series                                  | see pages 488–489 |
| Manual Line Starters & Enclosures           |                   |
| EMN NEMA Series                             | see pages 472–473 |
| EMN IEC Series                              | see page 474      |
| EMN Series                                  | see page 475      |
| NMN Series                                  | see page 487      |
| Manual Motor Starting Switches & Enclosures |                   |
| GUSC Series                                 | see page 476      |
| EFD Series                                  | see page 477      |
| MC Series                                   | see pages 483–484 |
| EDS Series                                  | see pages 478–480 |
| GHG 635 Series                              | see pages 481–482 |
| NSSC / NFSC                                 | see page 485      |
| Special Feature Kits                        |                   |
| For EPC Series                              | see page 471      |



### Application and Selection Quick Selector Chart

#### Applications:

Line starters are housed in enclosures suitable for specific environments, and are used for:

- Across-the-line starting of motors
- Motor running protection
- Undervoltage protection
- Remote or manual starting and stopping

#### Selection:

Considerations for selection of proper enclosure:

- The environment of the enclosure location in accordance with NEC/CEC and NEMA/EEMAC requirements
- The characteristics of the starter to be enclosed
- See "Quick-Selector" below for guidance

#### Options:

Many options are available on:

- Material and finishes where special atmospheric conditions prevail
- Special features for specific applications. See individual listings for available options, many of which are available in kit form for field addition to existing units.

#### Quick Selector Chart

| Enclosures for Starters |                                                                                                                |                           |              |                                                     |                           |                                                                    |                                         |
|-------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------|--------------|-----------------------------------------------------|---------------------------|--------------------------------------------------------------------|-----------------------------------------|
| Enclosures              | NEC/CEC – Hazardous Area Compliance                                                                            | NEMA/EEMAC Enclosure Type | Starter Type | NEMA/EEMAC Size Starters Single Speed Non-reversing | Motor Phase and Type      | Manufacturers Equipment Enclosed – Starter                         | Cover Type                              |
| MC                      | None                                                                                                           | 3, 4, 12                  | Manual       |                                                     | Single-AC                 | Cutler-Hammer                                                      | Gasketed                                |
| EPC                     | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III     | 3, 4, 7CD, 9EFG, 12       | Magnetic     | 0-2                                                 | Poly-AC                   | Allen-Bradley<br>Cutler-Hammer<br>G.E.<br>Square D                 | Threaded                                |
| EBMS                    | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III  | 3, 4, 7BCD, 9EFG, 12      | Magnetic     | 0-5                                                 | Poly-AC                   | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer                 | Bolted/<br>Ground<br>Joint/<br>Gasketed |
| EMN<br>NEMA             | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1 & 2, Groups E, F, G<br>Cl. III                                | 3, 4, 4X†, 7(CD), 9(EFG)  | Manual       | 0-1P                                                | DC and Single and Poly-AC | G.E.<br>Square D                                                   | Bolted                                  |
| EMN IEC                 | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1 & 2, Groups E, F, G<br>Cl. III                                | 3, 4, 4X†, 7(CD), 9(EFG)  | Manual       |                                                     | Single and Poly-AC        | Cutler-Hammer                                                      | Bolted                                  |
| EMN                     | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III     | 3, 7CD, 9EFG, 12          | Manual       | 0-1P                                                | Single and Poly-AC        | Allen-Bradley<br>Cutler-Hammer<br>G.E.<br>Square D                 | Bolted/<br>Ground<br>Joint              |
| GUSC                    | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III     | 3, 7CD, 9EFG, 12          | Manual       | 3, 7½, 15, 20                                       | Single-AC                 |                                                                    | Threaded                                |
| EDS,<br>EDSC‡           | Cl. I, Div. 1 & 2, Groups B*, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7CD, 9EFG, 12          | Manual       |                                                     | DC and Single AC          | Allen-Bradley<br>G.E.<br>Cutler-Hammer                             | Bolted/<br>Ground<br>Joint              |
| EFD                     | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III  | 3, 7BCD, 9EFG, 12         | Manual       |                                                     | DC and Single and Poly-AC | G.E.<br>Square D                                                   | Bolted/<br>Ground<br>Joint              |
| NSSC / NFSC             | None                                                                                                           | 3, 4X, 12                 | Manual       |                                                     | DC and Single and Poly-AC | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer                 | Screw and gasket                        |
| NMN                     | None                                                                                                           | 3, 4X, 12                 | Manual       | 0-1P                                                | Single AC                 | Allen-Bradley<br>G.E.<br>Square D                                  | Screw and gasket                        |
| NMG                     | None                                                                                                           | 3, 4X, 12                 | Manual       | 0-4                                                 | Poly-AC                   | Allen-Bradley<br>G.E.<br>Square D<br>Cutler-Hammer<br>Westinghouse | Hinged,<br>screw and<br>gasket          |

\*Check listings for Group B suitability.

†NEMA 4X rated when ordered with epoxy powder coating.

‡For factory sealed units see pages 536–537.

# EBMS Magnetic Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**2C**

## Applications:

Spectrum™ EBM hinged cover motor control enclosures are used:

- For general motor control – indoors or outdoors – in damp, wet, dirty, dusty hazardous locations, without the need for a protective shelter.
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent.
- For across-the-line starting, stopping, speed changing and reversing of polyphase AC induction motors.
- To provide motor overload and undervoltage protection.
- On switchracks or other assemblies where it's desired that motor control be centrally located.

## Features:

- Rugged, corrosion resistant, cast copper-free aluminum construction (less than 0.4 of 1%).
- Motor starter operating handle located through the right side wall of the body permits visual confirmation of correct component assembly and operation.
- Total compliance to the wiring end room requirements of the National Electrical Code® and Canadian Electrical Code.
- Semi-clamshell enclosure design, with an external flanged ground joint between body and cover makes interior components more accessible.
- Minimum enclosure-to-enclosure spacing with little interference between the opened cover and an adjacent enclosure.
- Copper-free aluminum hinges allow the cover to swing well out of the way.
- Stainless steel, quick release, captive, hex head cover bolts. Stainless steel springs provide clear indication cover bolts are fully retracted from body.
- Versatile, internal operating mechanisms allow for field adjustment to accommodate popular manufacturers' starters.
- Simple, straightforward installation of starter on pre-drilled mounting plate within enclosure. Mounting plate also field removable.
- Neoprene cover gasket permanently attached to the cover seals out moisture.
- Bodies have top and bottom drilled and tapped entrances for power conduits plus one at the bottom for control conduit. Removable reducers are supplied as standard, to accommodate smaller size conduits. All conduit entrances are plugged.
- Tap-on mounting feet.
- Optional EMPS control devices may be added to enclosure cover.
- Steel bracket for lifting larger enclosures during installation supplied as standard.



**Spectrum EBM motor control enclosures accommodate popular makes of starters.**

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- UL Standards: UL1203
- NEMA: 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shaft and bushing – stainless steel
- Interior parts – sheet steel, electrogalvanized
- Cover bolts, washers and retractile springs – stainless steel

## Electrical Rating Range:

- Motor starters – NEMA/EEMAC sizes 0–5

$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.  
 $\dagger\dagger$ With S752 or S753.

National Electrical Code is a Registered Trademark of the National Fire Protection Association.

## Options:

The following options are available from the factory by adding suffix to catalog number. Suffixes are added alphanumerically.

### Catalog Number System Example

EBMS1FB-①-W6413-②

① Options in this position are additions to the enclosures and should be listed alphanumerically.

② Options in this position are modifications to the motor starter and should be listed alphanumerically.

| Description                                                                                                                                                                                   | Position in Cat. # | Suffix           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|
| • Less Overload Relays (lighting contactor) .....                                                                                                                                             | ①                  | CL               |
| • Less Overload Relays (motor contactor) .....                                                                                                                                                | ①                  | CM               |
| • Control Circuit Transformer, 100VA for NEMA/EEMAC sizes 0-2, 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not included) ..... | ①                  | FTPS100          |
| • Control Circuit Transformer, 200VA for NEMA/EEMAC size 3, 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not included) .....    | ①                  | FTPS200          |
| • Control Circuit Transformer, 300VA for NEMA/EEMAC size 4, 5 600/480/240-120, 50 / 60 Hertz, with provision for fusing both primary leads and one secondary lead (fuses not included) .....  | ①                  | FTPS300          |
| • Pilot Light, 120VAC, Red Jewel, w/blank indicating plate .....                                                                                                                              | ①                  | J1③              |
| • Pilot Light, 120VAC, Green Jewel, w/blank indicating plate .....                                                                                                                            | ①                  | J3③              |
| • Less Heaters in Starter Overload Relay .....                                                                                                                                                | ②                  | 0                |
| • Start-Stop Pushbuttons (requires 2 spaces) .....                                                                                                                                            | ①                  | PB23③ $\ddagger$ |
| • On-Off Selector Switch .....                                                                                                                                                                | ①                  | RR2③ $\ddagger$  |
| • Hand-Off-Auto Selector Switch .....                                                                                                                                                         | ①                  | RR3③ $\ddagger$  |
| • Space Heater, 120 Volt, 25 Watts .....                                                                                                                                                      | ①                  | R11              |
| • Space Heater, 240 Volt, 25 Watts .....                                                                                                                                                      | ①                  | R22              |
| • Space Heater, 480 Volt, 25 Watts .....                                                                                                                                                      | ①                  | R44              |
| • Automatic Reset Overload Relay .....                                                                                                                                                        | ①                  | S1               |
| • Std. Drain, Class I, B, C&D; Class II, EF&G; Class III .....                                                                                                                                | ①                  | S756 $\ddagger$  |
| • Std. Breather & Drain, Class I, B, C&D; Class II, EF&G; Class III .....                                                                                                                     | ①                  | S756V $\ddagger$ |
| • External Epoxy Finish .....                                                                                                                                                                 | ①                  | S752             |
| • Internal and External Epoxy Finish .....                                                                                                                                                    | ①                  | S753             |
| • Additional control contacts, N.O. or N.C. – for single speed, non-reversing starters only (number limited by design of starter. Details on specific makes and sizes on request.)            |                    |                  |
| Aux. Contacts on starter 1 N.O. & 1 N.C. ....                                                                                                                                                 | ②                  | S781             |
| Aux. Contacts on starter 2 N.O. & 2 C. ....                                                                                                                                                   | ②                  | S782             |
| Aux. Contacts on starter 3 N.O. & 3 N.C. ....                                                                                                                                                 | ②                  | S783             |
| 12 Point Term. Block – 30 Amp, 300V .....                                                                                                                                                     | ①                  | S786             |
| • General Purpose Control Relay, 4 Pole N.O., contacts rated 10A @ 600V, coil 120VAC, 50-60 Hz .....                                                                                          | ①                  | S787*            |

$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\ddagger\ddagger$ With S752 or S753.

③ When specifying non-standard markings on any one of the following options with Spectrum™ EBM Motor Controls (J1, J3, PB23, RR2, RR3) it is necessary to order DSL Legend Plates for identification and marking of the device(s) being used. See page 449 for DSL Legend Plate listings.

\* Use of this option with NEMA/EEMAC Size 0 or 1 starters necessitates a larger enclosure. Use "B" size enclosures.

### Example:

|                 | Enclosure        | Enclosure for  |
|-----------------|------------------|----------------|
| Without Starter | Cat. #<br>EBMSFA | S787<br>EBMSFB |

# EBMS Magnetic Line Starters and Enclosures

**Single-Speed Non-Reversing  
3-Pole 60 hertz, 600 VAC Maximum**

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\frac{1}{2}$ , 4X $\frac{1}{2}$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**2C**

## Ordering Information:

- To order an enclosure complete with motor starter, insert the manufacturer's symbol in the designated position (see ‡) of the catalog number. Symbols are shown in the footnotes.
- Also specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.
- Enclosures without starters may be ordered. Select from the listings below.

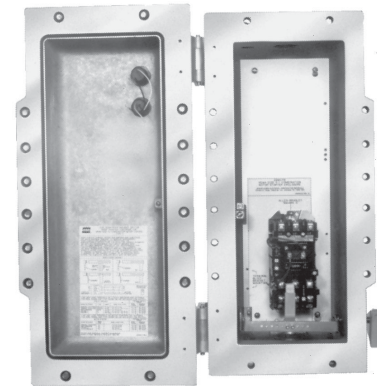
## EBMS Series Enclosures for Magnetic Line Starters Single Speed Non-Reversing

| Motor Starter        |       |              | Enclosure                    |                             |
|----------------------|-------|--------------|------------------------------|-----------------------------|
| Max. HP<br>Polyphase | Volts | NEMA<br>Size | Without<br>Starter<br>Cat. # | With<br>Starter<br>Cat. # § |
| 2                    | 120   | 0            | EBMSFA                       | EBMS0FA ①613                |
| 3                    | 120   | 1            | EBMSFA                       | EBMS1FA ①613                |
| 3                    | 240   | 0            | EBMSFA                       | EBMS0FA ①623                |
| 5                    | 480   | 0            | EBMSFA                       | EBMS0FA ①643                |
| 5                    | 600   | 0            | EBMSFA                       | EBMS0FA ①663                |
| 7½                   | 120   | 2            | EBMSFB                       | EBMS2FB ①613                |
| 7½                   | 240   | 1            | EBMSFA                       | EBMS1FA ①623                |
| 10                   | 480   | 1            | EBMSFA                       | EBMS1FA ①643                |
| 10                   | 600   | 1            | EBMSFA                       | EBMS1FA ①663                |
| 15                   | 120   | 3            | EBMSFH                       | EBMS3FH ①613                |
| 15                   | 240   | 2            | EBMSFB                       | EBMS2FB ①623                |
| 25                   | 480   | 2            | EBMSFB                       | EBMS2FB ①643                |
| 25                   | 600   | 2            | EBMSFB                       | EBMS2FB ①663                |
| 30                   | 240   | 3            | EBMSFH                       | EBMS3FH ①623                |
| 50                   | 480   | 3            | EBMSFH                       | EBMS3FH ①643                |
| 50                   | 600   | 3            | EBMSFH                       | EBMS3FH ①663                |
| 50                   | 240   | 4            | EBMSFH                       | EBMS4FH ①623                |
| 100                  | 480   | 4            | EBMSFH                       | EBMS4FH ①643                |
| 100                  | 600   | 4            | EBMSFH                       | EBMS4FH ①663                |
| 100                  | 240   | 5            | EBMSFL                       | EBMS5FL ①623                |
| 200                  | 480   | 5            | EBMSFL                       | EBMS5FL ①643                |
| 200                  | 600   | 5            | EBMSFL                       | EBMS5FL ①663                |

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

§ Motor starters are furnished with three heaters when heater ratings are fully specified.



**EBMS Series starter enclosures are available with magnetic line starters. NEMA sizes 0–5.**

①Motor starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen Bradley    | AB     |
| Square D         | D      |
| General Electric | G      |
| Cutler-Hammer    | W      |

# EBMS Magnetic Line Starters and Enclosures

Dimensions (In Inches)

Cl. I, Div. 1 & 2, Groups B, C, D

Cl. II, Div. 1, Groups E, F, G

Cl. II, Div. 2, Groups F, G

Cl. III

NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof

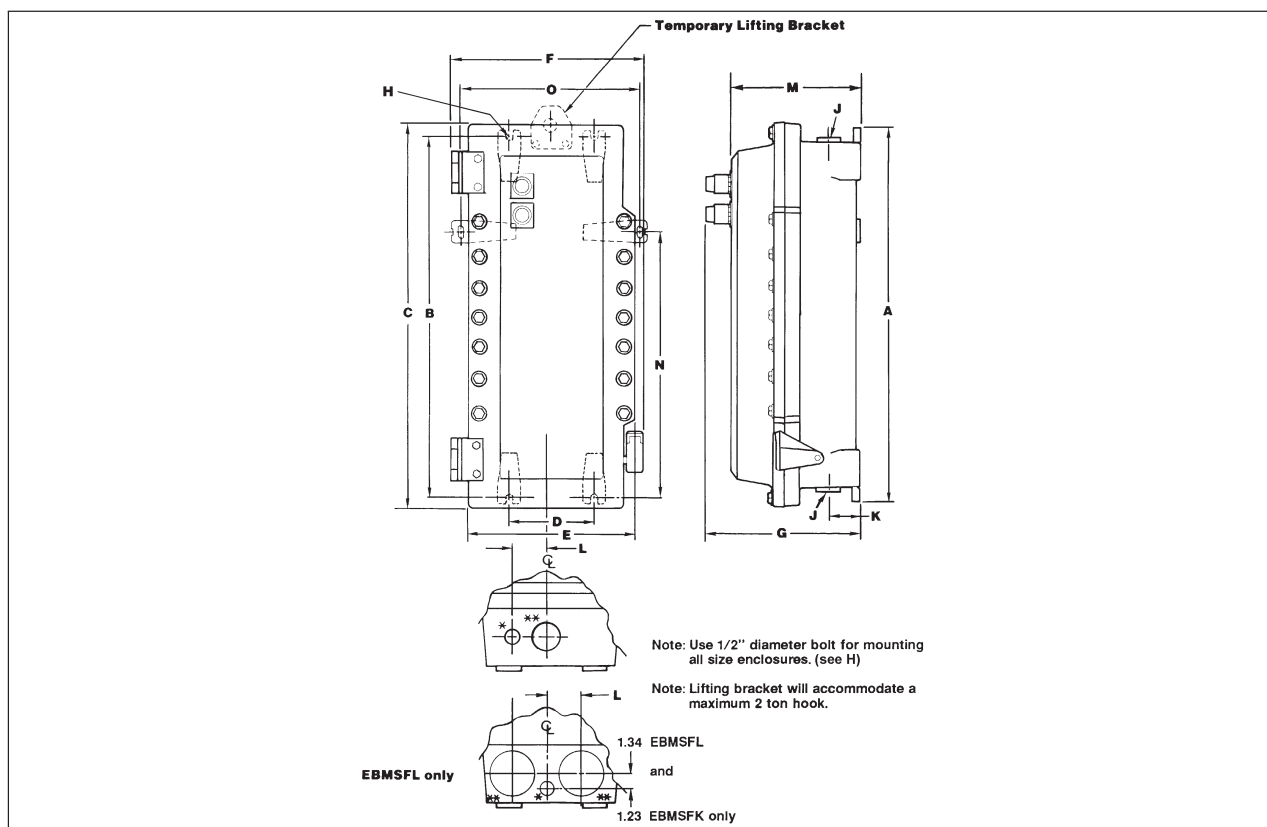
Dust-Ignitionproof

Raintight

Wet Locations

Watertight

2C



Dimensions are approximate, not for construction purposes.

## Single-Speed Non-Reversing Sizes 0, 1, 2, 3, 4 and 5 Starters

| Enclosure Only Cat. #         | Enclosure Size Symbol | A     | B     | C     | D     | E     | F     | G     | J** Conduit Entry Trade Size D&T | w/RE     | K    | L    | M     | N     | O     |
|-------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|----------------------------------|----------|------|------|-------|-------|-------|
| <b>Size 0,1 FVNR Starter§</b> |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFA                        | A                     | 18.25 | 17.25 | 19.00 | 6.00  | 12.63 | 14.38 | 12.13 | 2"                               | 1.5"     | 3.25 | 3.13 | 10.25 | —     | —     |
| <b>Size 2 FVNR Starter</b>    |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFB                        | B                     | 25.75 | 24.75 | 26.50 | 6.00  | 12.63 | 14.38 | 12.13 | 2"                               | 1.5"     | 3.25 | 3.13 | 10.25 | —     | —     |
| <b>Size 3,4 FVNR Starter</b>  |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFD $\dagger$              | D                     | 28.25 | 27.25 | 29.00 | 6.00  | 12.63 | 14.06 | 12.13 | 3"                               | 2.5"     | 3.25 | 3.13 | 10.25 | —     | —     |
| EBMSFH                        | H                     | 37.50 | 36.50 | 38.25 | 6.00  | 14.25 | 16.00 | 13.54 | 3"                               | 2.5"     | 3.25 | 3.94 | 11.66 | —     | —     |
| <b>Size 5 FVNR Starter</b>    |                       |       |       |       |       |       |       |       |                                  |          |      |      |       |       |       |
| EBMSFK $\dagger$              | K                     | 43.12 | 41.50 | 42.25 | 12.00 | 17.25 | 19.88 | 11.00 | (2) 3"                           | (2) 2.5" | 3.25 | 3.00 | 10.78 | —     | —     |
| EBMSFL                        | L                     | 53.25 | 51.50 | 52.88 | 12.00 | 17.50 | 20.18 | 15.00 | (2) 4"                           | (2) 3.5" | 4.00 | 3.50 | 13.03 | 41.50 | 18.00 |

§Use EBMSFB enclosure when S787 option is ordered with size 0 or 1 starter.

\*1" Drilled & Tapped conduit entry for control conductors supplied with PLG plug (top & bottom)

\*\*Conduit entrance for power conductors (top and bottom). (All conduit entrances supplied with RE reducer and PLG plug.)

$\dagger$ For Cutler-Hammer W200 Advantage® starters.

■Drilled & Tapped.

$\ddagger$  Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\dagger\dagger$ With S752 or S753.

# EPC Magnetic Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

2C

## Applications:

EPC magnetic line starters and enclosures are used:

- For across-the-line starting of polyphase AC induction motors
- In locations made hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide motor running protection, undervoltage protection, and remote starting and stopping

## Features:

- Quick-opening covers – less than two turns to remove or install
- Three section design for ease of installation
- Water-shedding construction with female threads on top cover, male threads on bottom cover, and top cover skirted
- Specially located stops and locks ensure adequate thread engagement and prevent overtightening
- Separate replaceable mounting bracket attached to the rear of the body provides three-point suspension for quick installation and leveling – one keyhole slot at top and two open slots at bottom
- Bodies have two taper tapped conduit hubs with integral bushings on the top, and two more directly below
- Universal mounting plate and reset mechanism will accommodate any of the motor starters in catalog listing
- When interior mounting plate is removed, line and load conductors are easily pulled into the wiring chamber. The interior assembly with starter attached is then replaced, final connections made, and covers assembled
- Furnished with third overload relay as standard

## Certifications and Compliances:

- NEC/CEC  
Class I, Division 1 & 2, Groups C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA/EEMAC: 3, 4, 7CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Bodies and covers – copper-free aluminum
- Reset handle – copper-free aluminum
- Reset shaft – stainless steel
- Interior parts – stainless steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized with chromate finish

## Electrical Rating Range:

- Starter Sizes 0 to 1 inclusive

## Options:

The following special options are available from factory by adding suffix to Cat. No. and many are available in kit form for field addition to existing units: See page 471 for listing of kits

### Description

Control circuit transformer 600/480/240–120 volts, 50 or 60 hertz

(Sizes 0 and 1 – 50VA, 100VA) Fusible – Secondary .....

Primary and secondary .....

Automatic reset overload relay .....

Less overload relays (lighting contactor) .....

Less overload relays (motor contactor) .....

Auxiliary Contacts:\*

1NO/1NC .....

2NO/2NC .....

3NO/3NC .....

Pilot light holes drilled, tapped and plugged for future addition of pilot lights –

one hole .....

two holes .....

Side bosses drilled and tapped same size as standard hubs .....

Back boss drilled and tapped same size as standard hubs .....

Standard Breather (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....

Standard Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....

Standard Breather and Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....

Universal Breather-Drain (Cl. I, Groups C, D; Cl. II, Groups F, G) .....

(2) Universal-Breather Drains (Cl. I, Groups C, D; Cl. II, Groups F, G) .....

Pushbuttons (heavy duty):

START-STOP .....

Selector switches (standard duty):

ON-OFF .....

HAND-OFF-AUTO.....

Pilot lights:

Red, 120 volt .....

Green, 120 volt .....

Pilot light transformers:

240 volt† .....

480 volt† .....

600 volt† .....

Space heaters:

120 volt .....

240 volt .....

480 volt .....

### Suffix

FT

FPTS

S1

CL

CM

S781

S782

S783

S541

S542

S366

S367

S219

S198

S198V

S454†

S454V†

PB3†

RR2†

RR3†

J1

J3

T2

T4

T5

R11

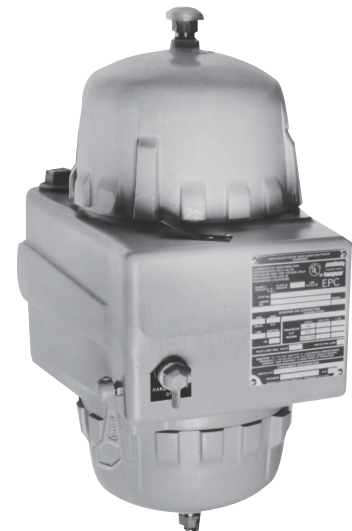
R22

R44

\*Application limited by starter or contactor design – consult factory.

†Required for pilot lights on other than 120 volt control circuits. One required for each lamp.

‡Not suitable for NEMA 4.



2C

## Crouse-Hinds

by **E•T•N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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# EPC Magnetic Line Starters and Enclosures

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

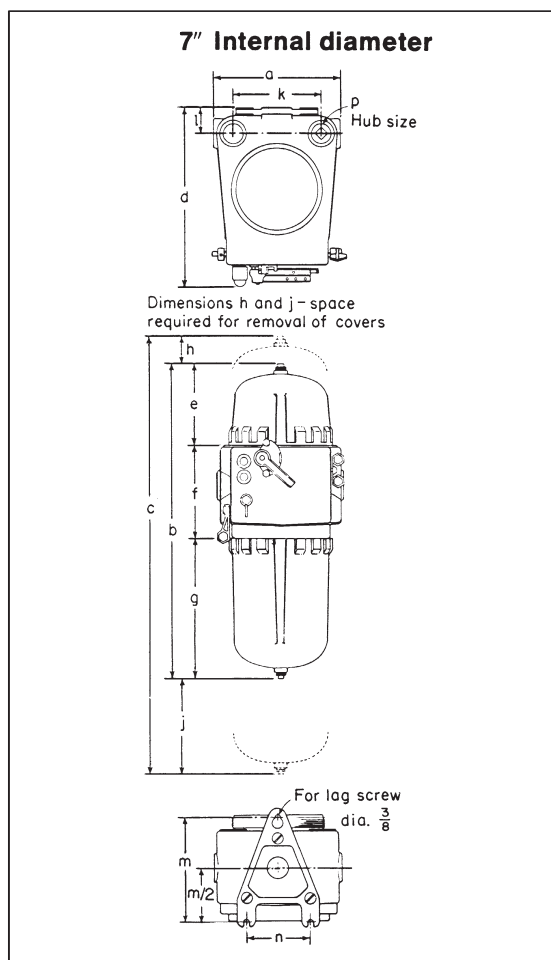
## Ordering Information:

To order an enclosure complete with starter, insert the manufacturer's symbol in the designated position of the catalog number. Symbols are shown in the footnote at the bottom of this page. Specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Enclosures only can be ordered. Select from listings.

| Motor Starter |           |       | Enclosure          |                 |                  | Without<br>Starter<br>Cat. # | With<br>Starter<br>Cat. # § | ①Motor Starters:<br>Manufacturer | Symbol |
|---------------|-----------|-------|--------------------|-----------------|------------------|------------------------------|-----------------------------|----------------------------------|--------|
| Max. HP       | Polyphase | Volts | NEMA/EEMAC<br>Size | Hub<br>Size in. | Int.<br>Dia. in. |                              |                             |                                  |        |
| 2             | 120       | 0     | 1¼                 | 1¼              | 7                | EPC97                        | EPC970 ①613                 | Allen-Bradley                    | AB     |
| 3             | 120       | 1     | 1¼                 | 1¼              | 7                | EPC97                        | EPC971 ①613                 | General Electric                 | G      |
| 3             | 240       | 0     | 1¼                 | 1¼              | 7                | EPC97                        | EPC970 ①623                 | Square D                         | D      |
| 5             | 480       | 0     | 1¼                 | 1¼              | 7                | EPC97                        | EPC970 ①643                 | Cutler-Hammer                    | W      |
| 5             | 600       | 0     | 1¼                 | 1¼              | 7                | EPC97                        | EPC970 ①653                 |                                  |        |
| 7½            | 240       | 1     | 1¼                 | 1¼              | 7                | EPC97                        | EPC971 ①623                 |                                  |        |
| 10            | 480       | 1     | 1¼                 | 1¼              | 7                | EPC97                        | EPC971 ①643                 |                                  |        |
| 10            | 600       | 1     | 1¼                 | 1¼              | 7                | EPC97                        | EPC971 ①653                 |                                  |        |

## Dimensions In Inches\*:



## Single-Speed Non-Reversing Sizes 0, 1, Starters

| Int. Dia.  | EPC97              | EPC97-FT<br>EPC97-FTPS |
|------------|--------------------|------------------------|
|            | 7"                 | 7"                     |
| Dimensions |                    | Dimensions†            |
| a          | 10 $\frac{5}{8}$   | 10 $\frac{5}{8}$       |
| b          | 19 $\frac{13}{16}$ | 24 $\frac{13}{16}$     |
| c          | 25 $\frac{13}{16}$ | 37 $\frac{13}{16}$     |
| d          | 14 $\frac{11}{16}$ | 14 $\frac{11}{16}$     |
| e          | 6 $\frac{3}{4}$    | 11 $\frac{3}{4}$       |
| f          | 7 $\frac{11}{16}$  | 7 $\frac{11}{16}$      |
| g          | 5 $\frac{3}{8}$    | 5 $\frac{3}{8}$        |
| h          | 2                  | 9                      |
| j          | 4                  | 4                      |
| k          | 7 $\frac{3}{8}$    | 7 $\frac{3}{8}$        |
| l          | 2 $\frac{1}{16}$   | 2 $\frac{1}{16}$       |
| m          | 9 $\frac{3}{8}$    | 9 $\frac{3}{8}$        |
| n          | 5 $\frac{1}{4}$    | 5 $\frac{1}{4}$        |
| p          | 1 $\frac{1}{4}$    | 1 $\frac{1}{4}$        |

\*Dimensions are approximate, not for construction.

†For units with Control Circuit Transformer (suffix FT or FTPS).

§ Starters are furnished with three heaters when heater ratings are fully specified.

**Crouse-Hinds**  
by **Eaton**

# EPC Magnetic Line Starters and Enclosures

2C

## Special Feature Kits

### Pushbutton Station and Selector Switch Kits

EPC magnetic line starter and EPC combination line starter enclosures are provided as standard with switch operating shaft holes drilled, tapped and plugged. Pushbutton stations and selector switches can be assembled in these enclosures in the field, using kits listed below.

Applies to 7" and 11" EPC

| Description                                         | Cat. #             |
|-----------------------------------------------------|--------------------|
| START-STOP pushbutton station assembly              | <b>EPC PB3 KIT</b> |
| Replacement pushbutton station only for EPC-PB3-KIT | <b>16320 N</b>     |
| ON-OFF selector switch assembly (2 position)        | <b>EPC RR2 KIT</b> |
| Replacement switch only for EPC-RR2-KIT             | <b>ESWP126</b>     |
| HAND-OFF-AUTO selector switch assembly (3 position) | <b>EPC RR3 KIT</b> |
| Replacement switch only for EPC-RR3-KIT             | <b>ESWP126</b>     |

### Pilot Light Kits

When EPC magnetic line starter and EPC combination line starter enclosures have been ordered with pilot light holes drilled, tapped and plugged (Cat. No. suffix S541 and S542), pilot lights can be assembled in the field, using kits listed below.

| Description                                                                                                      | Applies to   | Cat. #                  |
|------------------------------------------------------------------------------------------------------------------|--------------|-------------------------|
| Pilot light assembly less transformer                                                                            | 7", 11" EPC  | <b>EMP015 ① KIT</b>     |
| Pilot light assemblies with transformer and transformer mounting strap (for single pilot light) suffix S541      | 7" EPC only  | <b>EPC87 ① ② KIT</b>    |
|                                                                                                                  | 11" EPC only | <b>EPC813 ① ② KIT</b>   |
| 2 pilot light assemblies with 2 transformers and transformer mounting strap (for double pilot light) suffix S542 | 7" EPC only  | <b>EPC87 ① ① ② KIT</b>  |
|                                                                                                                  | 11" EPC only | <b>EPC813 ① ① ② KIT</b> |
| Replacement pilot light transformer only (240V primary)                                                          | All units    | <b>15129 A</b>          |
| Replacement pilot light transformer only (480V primary)                                                          | All units    | <b>15130 A</b>          |
| Replacement pilot light transformer only (600V primary)                                                          | All units    | <b>15131 A</b>          |

①Insert color symbol from table below and

②add primary voltage symbol

Example: EPC87-①-①-②-KIT with red and green pilot lights for 480 volts is EPC-J1-J3-T4-KIT.

| Color   | Symbol | Color | Symbol |
|---------|--------|-------|--------|
| Red     | J1     | Clear | J10    |
| Green   | J3     | Blue  | J11    |
| Amber   | J6     |       |        |
| Voltage | Symbol |       |        |
| 240     | T2     |       |        |
| 480     | T4     |       |        |
| 600     | T5     |       |        |

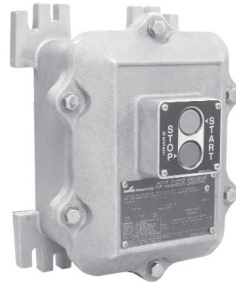
# EMN Series Pushbutton Style Compact Manual NEMA Starters

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X\*, 7(CD), 9(EFG)  
UL/cUL Listed

Explosionproof  
Wet Locations

## Applications:

- Explosionproof compact across-the-line manual NEMA starters for single and polyphase VAC or VDC motors
- Used on drilling rigs for mud agitators and shakers where flammable or explosive gases are present
- Also used for fans and blowers, pumps, compressors, and conveyors



## Features:

- Built to protect from mud and hose-directed water - NEMA 4
- Robust protection for start-stop buttons
- Option for no top entries for further protection from water ingress
- Pushbutton can be locked in "OFF" position
- Versatile mounting footprint accommodates field retrofit

## Catalog Numbering System:

| SERIES | ENCLOSURE TYPE | STARTER | OPTIONS† |
|--------|----------------|---------|----------|
| EMN    | 25             | D31     | S198V    |

SERIES  
EMN Explosionproof Compact Manual Motor Starter

ENCLOSURE TYPE  
25 Compact Pushbutton Enclosure pre-drilled for Square D starter  
27 Compact Pushbutton Enclosure pre-drilled for GE starter

STARTER  
D31 D = Square D and G = GE, followed by number of poles and NEMA size

## Certifications and Compliances:

- Class I, Division 1 & 2, Groups C, D
- Class II, Division 1 & 2, Groups E, F, G
- Class III
- NEMA 3, 4, 4X\*, 7(CD), 9(EFG)
- UL Standard: 1203
- cUL Standard: C22.2 No. 30

## Standard Materials:

- Enclosure – copper-free aluminum
- Shaft, bearing, and bolts – stainless steel
- O-ring gasket – Buna-N

## Electrical Ratings:

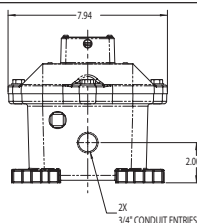
- NEMA starter sizes 0, 1, and 1P
- 1 to 10 HP

| NO. OF POLES | NEMA SIZE | MOTOR VOLTAGE | MAX. HORSEPOWER |            |     | CATALOG NUMBER |
|--------------|-----------|---------------|-----------------|------------|-----|----------------|
|              |           |               | SINGLE PHASE    | POLY-PHASE | DC  |                |
| 2            | 0         | 115           | 1               |            |     | EMN25 D20      |
|              |           | 230           | 2               |            |     |                |
|              | 1         | 115           | 2               |            |     | EMN25 D21      |
|              |           | 230           | 3               |            |     |                |
|              |           | 115           | 3               |            |     | EMN25 D21P     |
| 3            | 0         | 200-230       |                 | 3          |     | EMN25 D30      |
|              |           | 380-575       |                 | 5          |     |                |
|              | 1         | 200-230       |                 | 7-½        |     | EMN25 D31      |
|              |           | 380-575       |                 | 10         |     |                |
|              |           |               |                 |            |     |                |
| 2 DC         | 0         | 115           |                 |            | 1   | EMN25 D20DC    |
|              |           | 230           |                 |            | 1-½ |                |
|              | 1         | 115           |                 |            | 1-½ | EMN25 D21DC    |
|              |           |               |                 |            |     |                |
|              |           | 230           |                 |            | 2   |                |

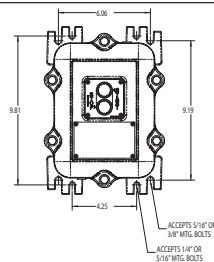
OPTIONS  
S752 Gray Epoxy Powder Coating, outside only  
S753 Gray Epoxy Powder Coating, outside and inside  
S198V Breather (ECD-N4B) and Drain (ECD-N4D)  
NTE No Top Entries

† Add heater suffix. See next page for heater tables.

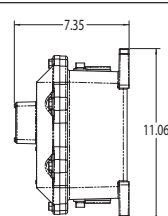
## Dimensions In Inches:



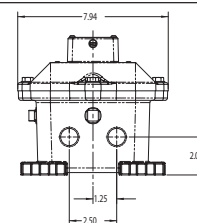
Top/Bottom View



Cover View



Side View



Bottom View  
No Top Entry Option

\*NEMA 4X rated when ordered with epoxy powder coating.

# EMN Series Pushbutton Style Compact Manual NEMA Starters

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X\*, 7(CD), 9(EFG)  
UL/cUL Listed

Explosionproof  
Wet Locations

2C

Select heater elements based on motor nameplate listed Full Load Amps (FLA). Trip rating of elements is 125% of motor minimum FLA listed for the elements. One heater is furnished with two-pole AC or DC starters and three heaters with three-pole starters.

## Heater Table (Square D)

| Suffix                                                | Motor Full-Load Current (A) |             |
|-------------------------------------------------------|-----------------------------|-------------|
|                                                       | 1 PH                        | 3 PH        |
| Following Selections for Size M-0, M-1, and M-1P Only |                             |             |
| B44                                                   | 0.33-0.36                   | 0.29-0.32   |
| B51                                                   | 0.37-0.40                   | 0.33-0.36   |
| B57                                                   | 0.41-0.45                   | 0.37-0.39   |
| B63                                                   | 0.46-0.52                   | 0.40-0.47   |
| B71                                                   | 0.53-0.59                   | 0.48-0.56   |
| B81                                                   | 0.60-0.66                   | 0.57-0.63   |
| B92                                                   | 0.67-0.73                   | 0.64-0.69   |
| B103                                                  | 0.74-0.81                   | 0.70-0.77   |
| B116                                                  | 0.82-0.91                   | 0.78-0.86   |
| B130                                                  | 0.92-1.02                   | 0.87-0.96   |
| B145                                                  | 1.03-1.14                   | 0.97-1.11   |
| B167                                                  | 1.15-1.29                   | 1.12-1.23   |
| B188                                                  | 1.20-1.42                   | 1.24-1.37   |
| B210                                                  | 1.43-1.64                   | 1.38-1.55   |
| B240                                                  | 1.65-1.80                   | 1.56-1.75   |
| B265                                                  | 1.81-2.10                   | 1.76-1.92   |
| B300                                                  | 2.11-3.20                   | 1.93-2.16   |
| B330                                                  | 2.31-2.61                   | 2.17-2.50   |
| B370                                                  | 2.62-2.99                   | 2.51-2.81   |
| B415                                                  | 3.00-3.37                   | 2.82-3.16   |
| B485                                                  | 3.38-3.94                   | 3.17-3.40   |
| B550                                                  | 3.95-4.24                   | 3.41-3.76   |
| B625                                                  | 4.25-4.54                   | 3.77-4.00   |
| B690                                                  | 4.55-5.29                   | 4.01-4.68   |
| B770                                                  | 5.30-5.73                   | 4.69-5.18   |
| B820                                                  | 5.74-6.35                   | 5.19-5.51   |
| B910                                                  | 6.36-7.08                   | 5.52-6.19   |
| B102                                                  | 7.09-7.83                   | 6.20-7.12   |
| B115                                                  | 7.84-8.47                   | 7.13-8.15   |
| B128                                                  | 8.48-9.83                   | 8.16-8.60   |
| B140                                                  | 9.84-10.50                  | 8.61-9.21   |
| B155                                                  | 10.60-11.40                 | 9.22-10.10  |
| B175                                                  | 11.50-12.80                 | 10.20-11.20 |
| B195                                                  | 12.90-13.90                 | 11.30-12.00 |
| B220                                                  | 14.00-16.10                 |             |
| B250                                                  | 16.20-18.00                 |             |
| Following Selections for Size M-1 and M-1P Only       |                             |             |
| B195                                                  |                             | 11.30-12.10 |
| B220                                                  |                             | 12.20-13.60 |
| B250                                                  | 16.20-17.60                 | 13.70-15.30 |
| B280                                                  | 17.70-20.60                 | 15.40-17.30 |
| B320                                                  | 20.70-23.10                 | 17.40-19.10 |
| B360                                                  | 23.20-26.00                 | 19.20-21.70 |
| B400                                                  |                             | 21.80-24.20 |
| B450                                                  |                             | 24.30-26.00 |
| Following Selections for Size M-1P Only               |                             |             |
| B360                                                  | 23.20-27.10                 |             |
| B400                                                  | 27.20-29.20                 |             |
| B450                                                  | 29.30-33.00                 |             |
| B500                                                  | 33.10-36.00                 |             |

## Heater Table (General Electric)

| Suffix                                         | Max. Motor Full-Load Current (A) |       |
|------------------------------------------------|----------------------------------|-------|
|                                                | 1 PH                             | 3 PH  |
| Following Selections for Size M-0 and M-1 Only |                                  |       |
| 36A                                            | 0.34                             | 0.29  |
| 39A                                            | 0.37                             | 0.31  |
| 43A                                            | 0.42                             | 0.34  |
| 48A                                            | 0.47                             | 0.40  |
| 54A                                            | 0.52                             | 0.44  |
| 60A                                            | 0.57                             | 0.48  |
| 66A                                            | 0.63                             | 0.52  |
| 71A                                            | 0.69                             | 0.58  |
| 78A                                            | 0.77                             | 0.64  |
| 87A                                            | 0.87                             | 0.71  |
| 97A                                            | 0.97                             | 0.81  |
| 109A                                           | 1.06                             | 0.89  |
| 118A                                           | 1.18                             | 0.98  |
| 131A                                           | 1.33                             | 1.12  |
| 148A                                           | 1.47                             | 1.22  |
| 163A                                           | 1.66                             | 1.38  |
| 184A                                           | 1.78                             | 1.48  |
| 196A                                           | 2.00                             | 1.66  |
| 220A                                           | 2.18                             | 1.80  |
| 239A                                           | 2.45                             | 2.03  |
| 268A                                           | 2.76                             | 2.28  |
| 301A                                           | 3.00                             | 2.47  |
| 326A                                           | 3.27                             | 2.71  |
| 356A                                           | 3.49                             | 2.87  |
| 379A                                           | 3.86                             | 3.18  |
| 419A                                           | 4.30                             | 3.54  |
| 466A                                           | 4.88                             | 3.89  |
| 526A                                           | 5.49                             | 4.51  |
| 592A                                           | 5.85                             | 4.90  |
| 630A                                           | 6.45                             | 5.30  |
| 695A                                           | 7.22                             | 5.94  |
| 778A                                           | 8.05                             | 6.70  |
| 867A                                           | 8.88                             | 7.36  |
| 955A                                           | 9.66                             | 7.98  |
| 104B                                           | 10.50                            | 8.59  |
| 113B                                           | 11.60                            | 9.46  |
| 125B                                           | 12.70                            | 10.30 |
| 137B                                           | 13.20                            | 11.70 |
| 151B                                           | 15.10                            | 12.60 |
| 163B                                           | 16.60                            | 13.80 |
| 180B                                           | 17.60                            | 15.40 |
| 198B                                           |                                  | 16.60 |
| 214B                                           |                                  | 17.40 |
| Following Selections for Size M-1 Only         |                                  |       |
| 198B                                           | 19.80                            |       |
| 214B                                           | 21.10                            |       |
| 228B                                           | 23.10                            | 19.40 |
| 250B                                           | 25.20                            | 20.60 |
| 273B                                           |                                  | 22.00 |
| 303B                                           |                                  | 25.30 |
| Following Selections for Size M-1P Only        |                                  |       |
| 778A                                           | 8.56                             |       |
| 867A                                           | 9.43                             |       |
| 955A                                           | 10.30                            |       |
| 104B                                           | 11.00                            |       |
| 113B                                           | 12.10                            |       |
| 125B                                           | 13.20                            |       |
| 137B                                           | 15.00                            |       |
| 151B                                           | 16.20                            |       |
| 163B                                           | 17.70                            |       |
| 180B                                           | 19.70                            |       |
| 198B                                           | 21.20                            |       |
| 214B                                           | 22.20                            |       |
| 228B                                           | 24.90                            |       |
| 250B                                           | 26.40                            |       |
| 273B                                           | 30.00                            |       |
| 303B                                           | 32.70                            |       |
| 330B                                           | 34.00                            |       |

# EMN Series Pushbutton Style Compact Manual IEC Starters

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X†, 7(CD), 9(EFG)  
UL/cUL Listed

Explosionproof  
Wet Locations

## Applications:

- Explosionproof compact across-the-line starting and stopping for small single and polyphase AC motors
- Used for small machine tools, turbines, fans and blowers, pumps, compressors, and conveyors where ignitable dusts, fibers, or filings accumulate
- IEC starters are more precisely rated and, as a result, save users money during operation
- Sophisticated IEC design reduces risk of motor damage during a fault



## Catalog Numbering System:

| SERIES | ENCLOSURE TYPE | STARTER | OPTIONS |
|--------|----------------|---------|---------|
| EMN    | 26             | WP16    | S198V   |

### SERIES

EMN Explosionproof Compact Manual Motor Starter

### ENCLOSURE TYPE

26 Compact Pushbutton Enclosure pre-drilled for Cutler-Hammer™ Starter

### STARTER

WP16 W = Cutler-Hammer™ followed by starter type suffix

- WP16 = IEC, .16A
- W1P6 = IEC, 1.6A
- W012 = IEC, 12A

## Features:

- Built to protect from mud and hose-directed water - NEMA 4 and robust protection of buttons
- Option for no top entries for further protection from water ingress
- Pushbutton can be locked in "OFF" position
- Versatile mounting footprint accommodates field retrofit

## Certifications and Compliances:

- Class I, Division 1 & 2, Groups C, D
- Class II, Division 1 & 2, Groups E, F, G
- Class III
- NEMA 3, 4, 4X†, 7(CD), 9(EFG)
- UL Standard: 1203
- cUL Standard: C22.2 No. 30

## Standard Materials:

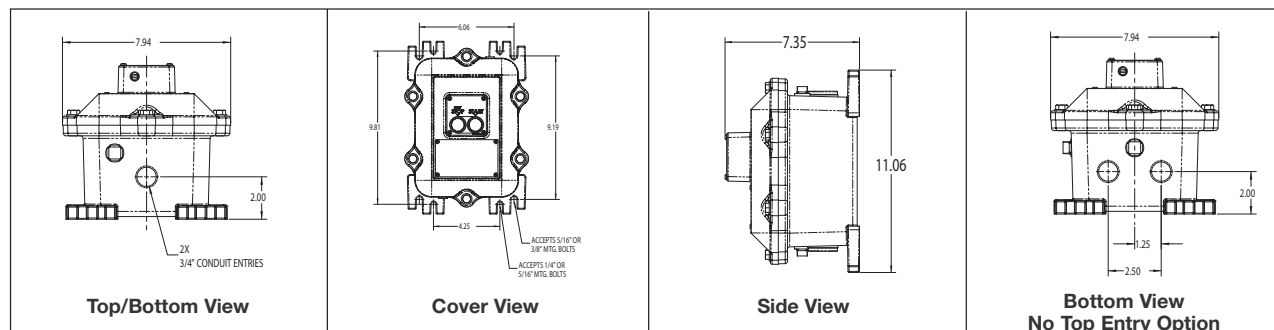
- Enclosure – copper-free aluminum
- Shaft, bearing, and bolts – stainless steel
- O-ring gasket – Buna-N

## Electrical Ratings:

- IEC Cutler-Hammer™ Type XTPB Manual Starter
- 1 to 15 HP

## Dimensions

In Inches:



†NEMA 4X rated when ordered with epoxy powder coating.

**Crouse-Hinds**  
by **E.T.N**

# EMN Series Manual Line Starters and Enclosures

600VAC Maximum

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

2C

## Applications:

EMN manual line starters and enclosures are used:

- For manual across-the-line starting of single and polyphase AC motors
- To provide motor running protection and manual starting and stopping
- In locations made hazardous due to the presence of flammable vapors, gases, or high combustible dusts
- For installation in petroleum refineries, chemical and petrochemical plants, and other process industry facilities
- In damp, wet, or corrosive locations

## Features:

- Compact, rectangular enclosure makes optimum use of internal space
- Operating handle may be padlocked in either "ON" or "OFF" position
- Compact design allows installation in area where space is limited
- Furnished with drilled and tapped conduit openings
- Polyphase manual starters are furnished with third overload relay as standard

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 14

## Standard Materials:

- Bodies, covers and toggle operator – copper-free aluminum
- Operating shaft – stainless steel
- Internal operating bail – sheet steel or aluminum

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized with chromate finish

## Electrical Rating Ranges:

- Starter sizes 0, 1, 1P

## Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                             | Suffix |
|-----------------------------------------------------------------------------------------|--------|
| Standard Breather (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....           | S219   |
| Standard Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) .....              | S198   |
| Standard Breather and Drain (Cl. I, Groups C, D; Cl. II, Groups E, F, G; Cl. III) ..... | S198V  |
| Universal Breather-Drain (Cl. I, Groups C, D; Cl. II, Groups F, G) ....                 | S454   |
| (2) Universal Breather-Drains (Cl. I, Groups C, D; Cl. II, Groups F, G) ....            | S454V  |

## Ordering Information:

Specify HP, voltage, frequency, number of phases, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Two pole starters require one heater; three pole starters have three heaters.



2C

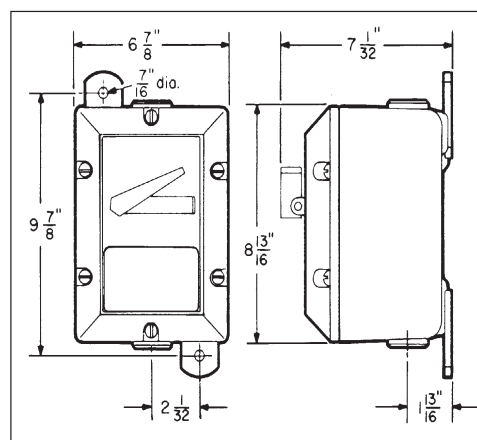
## Motor Starter

| NEMA Size | Poles (Phase) | Max. AC HP Ratings |          |          | Enclosure With Starter Cat. # |
|-----------|---------------|--------------------|----------|----------|-------------------------------|
|           |               | 115V               | 208/240V | 480/600V |                               |
| M-0       | 2 (1PH)       | 1                  | 2        |          | EMN24 W20                     |
| M-1       | 2 (1PH)       | 2                  | 3        |          | EMN24 W21                     |
| M-1P      | 2 (1PH)       | 3                  | 5        |          | EMN24 W21P                    |
| M-0       | 3 (3PH)       | 2                  | 3        | 5        | EMN24 W30                     |
|           | 3 (1PH)       | 2                  | 3        |          |                               |
| M-1       | 3 (3PH)       | 3                  | 7½       | 10       | EMN24 W31                     |

## Enclosure Without Starter

| Starter Manufacturer | Enclosure Cat. #† |
|----------------------|-------------------|
| Cutler-Hammer        | EMN24             |

## Dimensions\* In Inches:



†Enclosures are furnished with two 1¼" drilled and tapped openings with 1¼" to 1" reducers.  
\*Dimensions are approximate, not for construction purposes.



Cl. I, Div. 1 & 2, Groups C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 7CD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations

## Applications:

GUSC manual motor starters are used:

- In a rigid metallic conduit system for surface mounting adjacent to or remote from the equipment being controlled
- To prevent arcing of the enclosed switches from causing ignition of a specific hazardous atmosphere, or atmospheres, external to the enclosure
- In industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas, or metal handling or finishing areas where the atmosphere may contain hazardous gases and/or dust
- In non-hazardous areas where sturdy, durable enclosures are required

## Features:

- Enclosures are of rugged metal construction with mounting lugs and taper tapped hubs with integral bushings, in a through feed or bottom feed arrangement, for connection to the rigid metallic conduit
- Cover is threaded, which provides for fast and proper assembly
- Provided with a threaded operating shaft and bushing
- Provision is made to use a padlock with  $\frac{1}{4}$ " hasp, to lock the operating lever in an "ON" or "OFF" position
- Body and cover threads treated with lubricant at factory to provide raintightness

## Certifications and Comiances:

- NEC/CEC:
  - Class I, Div. 1 & 2, Groups C, D
  - Class II, Div. 1, Groups E, F, G
  - Class II, Div. 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7CD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2, No. 30

## Standard Materials:

- Body – *Feraloy*® iron alloy
- Cover – copper-free aluminum
- Shaft – stainless steel
- Shaft bushing – stainless steel

## Standard Finishes:

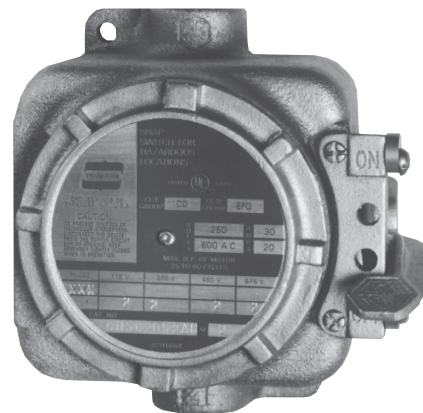
- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

## Size Ranges:

- Hub size –  $\frac{3}{4}$ " (through feed arrangement)

## Electrical Rating Ranges:

- See below



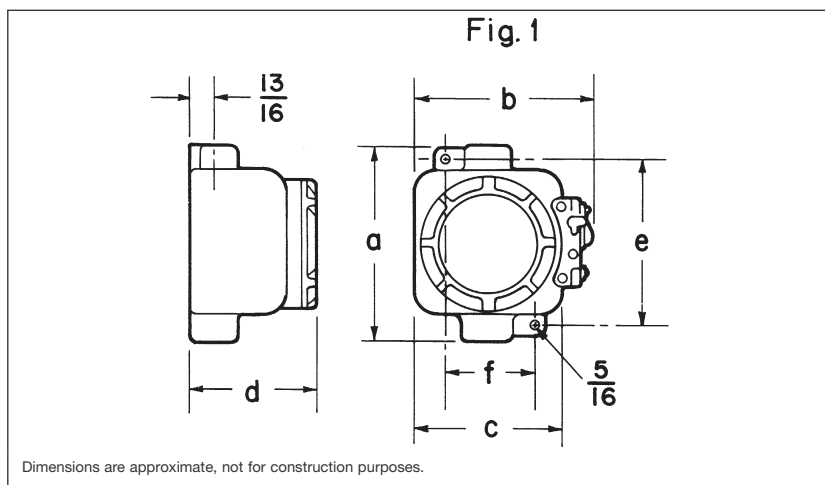
## Ordering Information:

| Cat. #       | Style  | Rating/Horsepower |                |                |                | Hub Size        |
|--------------|--------|-------------------|----------------|----------------|----------------|-----------------|
|              |        | 120VAC / 3 HP     | 240VAC / 7½ HP | 480VAC / 15 HP | 600VAC / 15 HP |                 |
| GUSC2013-MS* | 3-Pole | 30A               | 30A            | 30A            | 20A            | $\frac{3}{4}$ " |

| Cat. #      | Style  | Rating/Horsepower |                |                |                | Hub Size        |
|-------------|--------|-------------------|----------------|----------------|----------------|-----------------|
|             |        | 120VAC / 3 HP     | 240VAC / 7½ HP | 480VAC / 15 HP | 600VAC / 20 HP |                 |
| GUSC2036-MS | 3-Pole | 40A               | 40A            | 40A            | 40A            | $\frac{3}{4}$ " |

\*Also rated for 30A, 250VDC, 15 HP.

## Dimensions In Inches:



| Type                       | Size   | a               | b               | c              | d              | e              | f |
|----------------------------|--------|-----------------|-----------------|----------------|----------------|----------------|---|
| Through Feed Hubs – Fig. 1 |        |                 |                 |                |                |                |   |
|                            | 3-Pole | $6\frac{3}{16}$ | $6\frac{1}{16}$ | $4\frac{7}{8}$ | $4\frac{1}{8}$ | $5\frac{3}{8}$ | 3 |





## EDS Series Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 7B\*CD, 9EFG

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations

### Applications:

Factory sealed enclosures are installed in a rigid metallic conduit system for surface mounting adjacent to or remote from equipment being controlled and are used:

- To prevent arcing of enclosed device from causing ignition of a specific hazardous atmosphere or atmospheres external to the enclosure
  - In industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas, or metal handling or finishing areas where atmosphere may contain hazardous gases and/or dust
  - In non-hazardous areas where sturdy, durable enclosures are required
  - In conjunction with magnetic starters or contactors for remote control of motors
- Manual motor starting switch enclosures are used:
- For manual starting of small AC or DC motors
  - To provide manual starting and stopping and, in the case of units with heaters, motor running protection

### Features:

Factory sealed devices have many distinct advantages:

- Reduce installation problems
- Eliminate external seals
- Lower installation costs
- Improve safety
- Mounting lugs and taper tapped hubs with integral bushings
- Large machine screws for fastening covers to bodies
- Lockout hole for padlock having 1/4" hasp is provided
- Close tolerances in machining of wide, mating flanges and journaled shafts and bearings produce flametightness of enclosure joints
- Dead end (EDS) or through feed (EDSC) hubs – 3/4" or 1" sizes

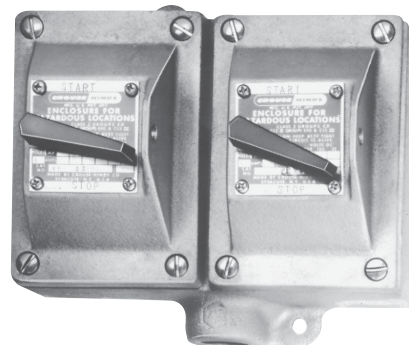
### Certifications and Complies:

- NEC/CEC
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7B\*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

\*Seals must be installed within 1 1/2" of each conduit opening in Division 1.



EDSC2199



EDS2299

### Standard Materials:

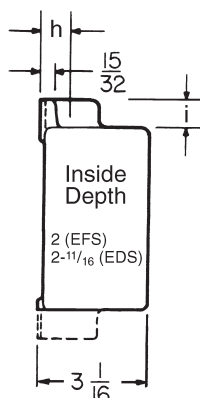
- Bodies – *Feraloy*® iron alloy (U.S.); copper-free aluminum (Canada)
- Shafts & bushings – stainless steel
- Sealing enclosures – copper-free aluminum

### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Type 6 / 6 nylon – black
- Stainless steel – natural

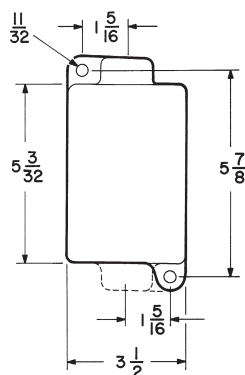
### Dimensions In Inches:

#### Side View

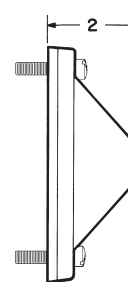
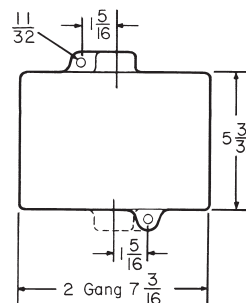


#### Front View

##### Single gang



##### Two gang



Surface covers have same length and width as single & 2 gang bodies.

Dimensions are approximate, not for construction purposes.

### Options:

| Description                                                          | Suffix |
|----------------------------------------------------------------------|--------|
| For use in Group B hazardous areas                                   | GB*    |
| Bodies and covers (single and two gang units) – copper-free aluminum | SA     |

| Hub Size | Dim. "h" | Dim. "i" |
|----------|----------|----------|
| 3/4      | 7/8      | 1 3/16   |
| 1        | 1        | 1 5/16   |

# EDS Series Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**2C**

## Ordering Information

### With Allen-Bradley Bulletin 600 Switches

| Maximum HP Ratings |                     |                     |                         |
|--------------------|---------------------|---------------------|-------------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC | Cat. #                  |
| 1                  | 1 hp                |                     | <b>A B BUL 600 TOX4</b> |
| 2                  | 1 hp                | ¾ hp                | <b>A B BUL 600 TOX5</b> |

| Poles              | Hub<br>Size in. | Dead end Cat. #                        | Through feed Cat. #                      |
|--------------------|-----------------|----------------------------------------|------------------------------------------|
| <b>Single Gang</b> |                 |                                        |                                          |
| 1                  | ¾<br>1          | <b>EDS2199</b> ①<br><b>EDS3199</b> ①   | <b>EDSC2199</b> ①<br><b>EDSC3199</b> ①   |
| 2                  | ¾<br>1          | <b>EDS21100</b> ①<br><b>EDS31100</b> ① | <b>EDSC21100</b> ①<br><b>EDSC31100</b> ① |
| <b>Two Gang</b>    |                 |                                        |                                          |
| 1                  | ¾<br>1          | <b>EDS2299</b> ①<br><b>EDS3299</b> ①   | <b>EDSC2299</b> ①<br><b>EDSC3299</b> ①   |
| 2                  | ¾<br>1          | <b>EDS22100</b> ①<br><b>EDS32100</b> ① | <b>EDSC22100</b> ①<br><b>EDSC32100</b> ① |

### With General Electric Switches

| Maximum HP Ratings |                     |                 |                 |                   |
|--------------------|---------------------|-----------------|-----------------|-------------------|
| Poles              | 115-230<br>Volts AC | 115<br>Volts DC | 230<br>Volts DC | Cat. #            |
| 1                  | 1 hp                | 1 hp            | ¾ hp            | <b>GE CR101 Y</b> |
| 2                  | 1 hp                | 1 hp            | 1 hp            | <b>GE CR101 H</b> |

| Poles              | Hub Size<br>in. | Dead end Cat. #                        | Through feed Cat. #                      |
|--------------------|-----------------|----------------------------------------|------------------------------------------|
| <b>Single Gang</b> |                 |                                        |                                          |
| 1                  | ¾<br>1          | <b>EDS21093</b> ①<br><b>EDS31093</b> ① | <b>EDSC21093</b> ①<br><b>EDSC31093</b> ① |
| 2                  | ¾<br>1          | <b>EDS21094</b> ①<br><b>EDS31094</b> ① | <b>EDSC21094</b> ①<br><b>EDSC31094</b> ① |
| <b>Two Gang</b>    |                 |                                        |                                          |
| 1                  | ¾<br>1          | <b>EDS22093</b> ①<br><b>EDS32093</b> ① | <b>EDSC22093</b> ①<br><b>EDSC32093</b> ① |
| 2                  | ¾<br>1          | <b>EDS22094</b> ①<br><b>EDS32094</b> ① | <b>EDSC22094</b> ①<br><b>EDSC32094</b> ① |

### Heater Table (Allen-Bradley)

| Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number | Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number |
|---------------------------------|------------------------------------------|---------------------------------|------------------------------------------|
| 0.17                            | P1                                       | 2.92                            | P22                                      |
| 0.21                            | P2                                       | 3.09                            | P23                                      |
| 0.25                            | P3                                       | 3.32                            | P24                                      |
| 0.32                            | P4                                       | 3.77                            | P25                                      |
| 0.39                            | P5                                       | 4.16                            | P26                                      |
| 0.46                            | P6                                       | 4.51                            | P27                                      |
| 0.57                            | P7                                       | 4.93                            | P28                                      |
| 0.71                            | P8                                       | 5.43                            | P29                                      |
| 0.79                            | P9                                       | 6.03                            | P30                                      |
| 0.87                            | P10                                      | 6.83                            | P31                                      |
| 0.98                            | P11                                      | 7.72                            | P32                                      |
| 1.08                            | P12                                      | 8.24                            | P33                                      |
| 1.19                            | P13                                      | 8.9                             | P34                                      |
| 1.30                            | P14                                      | 9.6                             | P35                                      |
| 1.43                            | P15                                      | 10.8                            | P36                                      |
| 1.58                            | P16                                      | 12.0                            | P37                                      |
| 1.75                            | P17                                      | 13.5                            | P38                                      |
| 1.88                            | P18                                      | 15.2                            | P39                                      |
| 2.13                            | P19                                      |                                 |                                          |
| 2.40                            | P20                                      |                                 |                                          |
| 2.58                            | P21                                      |                                 |                                          |

### Heater Table (General Electric)

| Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number | Max. Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-Hinds<br>Symbol Number |
|---------------------------------|------------------------------------------|---------------------------------|------------------------------------------|
| .48                             | G2                                       | 3.01                            | G22                                      |
| .53                             | G3                                       | 3.27                            | G23                                      |
| .58                             | G4                                       | 3.56                            | G24                                      |
| .65                             | G5                                       | 3.88                            | G25                                      |
| .71                             | G6                                       | 4.22                            | G26                                      |
| .78                             | G7                                       | 4.60                            | G27                                      |
| .86                             | G8                                       | 5.00                            | G28                                      |
| .95                             | G9                                       | 5.43                            | G29                                      |
| 1.04                            | G10                                      | 5.90                            | G30                                      |
| 1.14                            | G11                                      | 6.41                            | G31                                      |
| 1.25                            | G12                                      | 6.98                            | G32                                      |
| 1.37                            | G13                                      | 7.60                            | G33                                      |
| 1.49                            | G14                                      | 8.25                            | G34                                      |
| 1.63                            | G15                                      | 8.95                            | G35                                      |
| 1.78                            | G16                                      | 9.75                            | G36                                      |
| 1.95                            | G17                                      | 10.6                            | G37                                      |
| 2.13                            | G18                                      | 11.4                            | G38                                      |
| 2.32                            | G19                                      | 12.5                            | G39                                      |
| 2.53                            | G20                                      | 13.6                            | G40                                      |
| 2.76                            | G21                                      | 14.8                            | G41                                      |
|                                 |                                          | 16.0                            | G42                                      |

① Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted.

\*Add GB suffix. Seals must be installed within 1½" of each conduit opening for Group B usage.

## Crouse-Hinds

by **E•T•N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

479

2C

# 2C

## EDS Series Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

### With Cutler-Hammer Switches

#### Maximum HP Ratings

| Poles | 120-240<br>Volts AC | 32<br>Volts DC | 120<br>Volts DC | 240<br>Volts DC | Cat. #            |
|-------|---------------------|----------------|-----------------|-----------------|-------------------|
| 1     | 1 hp                | 1/4 hp         | 1/4 hp          | 1/4 hp          | <b>WEST MST01</b> |
| 2     | 1 hp                | 1/4 hp         | 1 hp            | 3/4 hp          | <b>WEST MST02</b> |

| Poles              | Hub Size in. | Dead end Cat. #                        | Through feed Cat. #                      |
|--------------------|--------------|----------------------------------------|------------------------------------------|
| <b>Single Gang</b> |              |                                        |                                          |
| 1                  | 3/4<br>1     | <b>EDS21101</b> ①<br><b>EDS31101</b> ① | <b>EDSC21101</b> ①<br><b>EDSC31101</b> ① |
| 2                  | 3/4<br>1     | <b>EDS21102</b> ①<br><b>EDS31102</b> ① | <b>EDSC21102</b> ①<br><b>EDSC31102</b> ① |
| <b>Two Gang</b>    |              |                                        |                                          |
| 1                  | 3/4<br>1     | <b>EDS22101</b> ①<br><b>EDS32101</b> ① | <b>EDSC22101</b> ①<br><b>EDSC32101</b> ① |
| 2                  | 3/4<br>1     | <b>EDS22102</b> ①<br><b>EDS32102</b> ① | <b>EDSC22102</b> ①<br><b>EDSC32102</b> ① |

### Heater Table (Cutler-Hammer)

| Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number | Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number |
|---------------------------|------------------------------------|---------------------------|------------------------------------|
| .43                       | W 1                                | 2.95                      | W21                                |
| .48                       | W 2                                | 3.27                      | W22                                |
| .53                       | W 3                                | 3.59                      | W23                                |
| .58                       | W 4                                | 3.99                      | W24                                |
| .64                       | W 5                                | 4.39                      | W25                                |
| .71                       | W 6                                | 4.79                      | W26                                |
| .78                       | W 7                                | 5.26                      | W27                                |
| .87                       | W 8                                | 5.83                      | W28                                |
| .95                       | W 9                                | 6.39                      | W29                                |
| 1.03                      | W10                                | 7.03                      | W30                                |
| 1.15                      | W11                                | 7.74                      | W31                                |
| 1.27                      | W12                                | 8.46                      | W32                                |
| 1.35                      | W13                                | 9.35                      | W33                                |
| 1.51                      | W14                                | 10.30                     | W34                                |
| 1.67                      | W15                                | 11.35                     | W35                                |
| 1.83                      | W16                                | 12.47                     | W36                                |
| 1.99                      | W17                                | 13.67                     | W37                                |
| 2.23                      | W18                                | 15.12                     | W38                                |
| 2.47                      | W19                                | 16.00                     | W39                                |
| 2.71                      | W20                                |                           |                                    |

① Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted.

\*Add GB suffix. Seals must be installed within 1 1/2" of each conduit opening for Group B usage.

# GHG 635 Series Explosion Protected Manual Motor Starters 25 Amp, 690 VAC Non-metallic Enclosure

UL/cUL Listed  
Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zones 1 and 2, AEx de  
IIB + H<sub>2</sub>, T5, T6  
Cl. II, Div. 1, Groups E, F, G (cUL)

CENELEC - PTB 99  
ATEX 1162 Certified  
Ex de IIC, T6, Zones 1 and 2  
Ex de IIC, T6 Zones 21 and 22  
IP66, NEMA 4X

2C

## Applications:

- Explosion protected manual motor starters are used in a metallic conduit or cable system for surface mounting to protect motors against overload and phase failure.

## Features:

- Explosion protected factory sealed circuit breaker and manual motor starter
- Innovative break-line in cover allows full wiring access, making installation quick and easy
- Switch handle provides clear indication of switch position
- Lockable handle meets OSHA lockout/tagout requirements, provision for 3 padlocks
- Large rotary handle provides easy gripping with gloved hands
- Captive cover screws

## Certifications and Complies:

- UL/cUL Listed
- Class I, Division 2, Groups A, B, C, D
- Class I, Zones 1 and 2, Ex de IIB+H<sub>2</sub>, T6
- Class II, Division 1, Groups E, F, G (cUL)
- CENELEC - PTB 99-ATEX 1162
- Ex de IIC, T6, Zones 1 and 2
- IP66, NEMA 4X

## Standard Materials:

- Enclosure - Fiberglass-reinforced polyester  
Nonmetallic, corrosion resistant  
Increased safety Ex-e protection  
Impact Resistant  
NEMA 4X, IP66 Protection  
Enclosure meets UL 94-VO  
UV rated
- Enclosure Gasket - Silicon
- Handle - Impact-resistant thermoplastic
- Cover Screws - Stainless steel
- Conduit Entries - Zinc Myers Hubs
- Brass Mounting plate - Ground continuity



## Technical Data

### Type of Protection

### Rated Voltage

### Rated Current

### Rated Current, Aux. Contact

### Short Circuit

### Under Voltage Trip

### Connection Terminals

### Connection Terminals, Aux. Contact

### Conduit or Cable Entries

### Weight

(A)Ex ed IIC T5, T6

Up to 690 VAC

Up to 25 A

2 A

See table on next page

Tripping at 15% – 75% V-rated  
Switching - on when V> 80% V-rated

Up to 10mm<sup>2</sup>

2 x 2.5 mm<sup>2</sup>

2 x 3/4" Myers hubs

5.5 lbs./2.5 Kg.

2C

# 2C GHG 635 Series Explosion Protected Manual Motor Starters 25 Amp, 690 VAC Non-metallic Enclosure

UL/cUL Listed  
Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zones 1 and 2, AEx de  
IIB + H<sub>2</sub>, T5, T6  
Cl. II, Div. 1, Groups E, F, G (cUL)

CENELEC - PTB 99  
ATEX 1162 Certified  
Ex de IIC, T6, Zones 1 and 2  
Ex de IIC, T6 Zones 21 and 22  
IP66, NEMA 4X

## Short Circuit Protection

| Setting Range   | 400 VAC AIC | 500 VAC AIC | 690 VAC AIC |
|-----------------|-------------|-------------|-------------|
| 0.1 A – 1.6 A   | N/A*        | N/A*        | N/A*        |
| 1.6 A – 2.5 A   | N/A*        | N/A*        | 40          |
| 2.5 A – 4.0 A   | N/A*        | 60          | 10          |
| 4.0 A – 6.3 A   | N/A*        | 40          | 7           |
| 6.3 A – 9.0 A   | N/A*        | 30          | 5           |
| 9.0 A – 12.5 A  | 75          | 27          | 4.5         |
| 12.5 A – 16.0 A | 60          | 25          | 4           |
| 16.0 A – 20.0 A | 55          | 22          | 3.5         |
| 20.0 A – 25.0 A | 50          | 20          | 3           |

\* Short-circuit proof. No back-up fuse required.

## Ordering Information

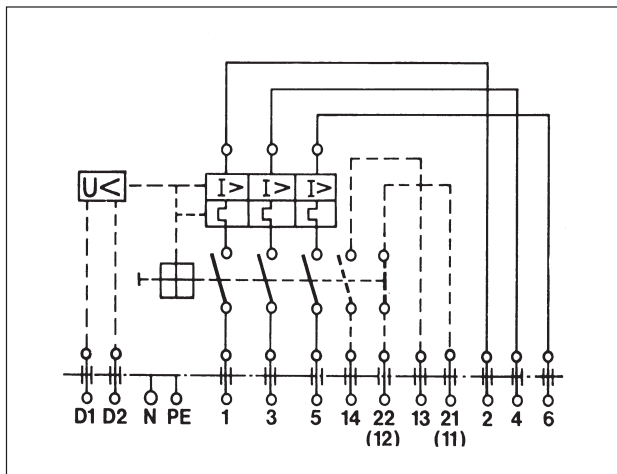
| Setting Range or rated current | Cat. #             |
|--------------------------------|--------------------|
| 0.1 – 0.16 A                   | GHG 635 1101 L0101 |
| 0.16 – 0.25 A                  | GHG 635 1101 L0102 |
| 0.25 – 0.40 A                  | GHG 635 1101 L0103 |
| 0.40 – 0.63 A                  | GHG 635 1101 L0104 |
| 0.63 – 1.0 A                   | GHG 635 1101 L0105 |
| 1.0 – 1.6 A                    | GHG 635 1101 L0106 |
| 1.6 – 2.5 A                    | GHG 635 1101 L0107 |
| 2.5 – 4.0 A                    | GHG 635 1101 L0108 |
| 4.0 – 6.3 A                    | GHG 635 1101 L0109 |
| 6.3 – 9.0 A                    | GHG 635 1101 L0110 |
| 9.0 – 12.5 A                   | GHG 635 1101 L0111 |
| 12.5 – 16 A                    | GHG 635 1101 L0112 |
| 16 – 20 A                      | GHG 635 1101 L0113 |
| 20 – 25 A                      | GHG 635 1101 L0114 |

## Accessory Option†

- 1 = without aux. contact
- 2 = with aux. contact 1 NO + 1NC
- 3 = with aux. contact 2 NO

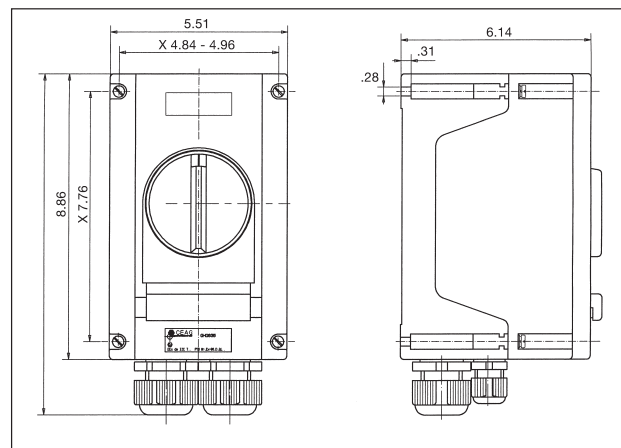
†Catalog numbers on this page are shown without auxiliary contacts. To add aux. contacts, change last number in "1101" to a 2 or 3. Ex. 1102.

## Wiring Diagram



## Dimensions

In Inches:



# MC Series Manual Motor Starting Switches and Enclosures

NEMA 3, 4, 12

Raintight

Wet Locations

2C

## Applications:

- MC manual motor starting switches and enclosures are used:
- For manual starting of small AC and DC motors of one horsepower or less (see next page for ratings)
  - In damp, wet or corrosive locations such as dairies, meat packing plants, chemical plants and outdoor locations
  - To provide motor running protection and manual starting and stopping

## Features:

- Enclosure is compact and gasketed to meet NEMA/EEMAC 4 requirements for watertightness
- Switch can be padlocked in either the "ON" or "OFF" positions
- Provided with dead end (MC) or throughfeed (MCC) hubs – 1/2" and 3/4" sizes – with mounting feet

## Certifications and Compliances:

- NEMA/EEMAC: 3, 4, 12
- UL Standard: 508
- CSA Standard: C22.2 No. 14

## Standard Materials:

- Body and cover – *Feraloy*® iron alloy
- Operating handle – copper-free aluminum
- Operating shaft – stainless steel

## Standard Finishes:

- Feraloy* – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

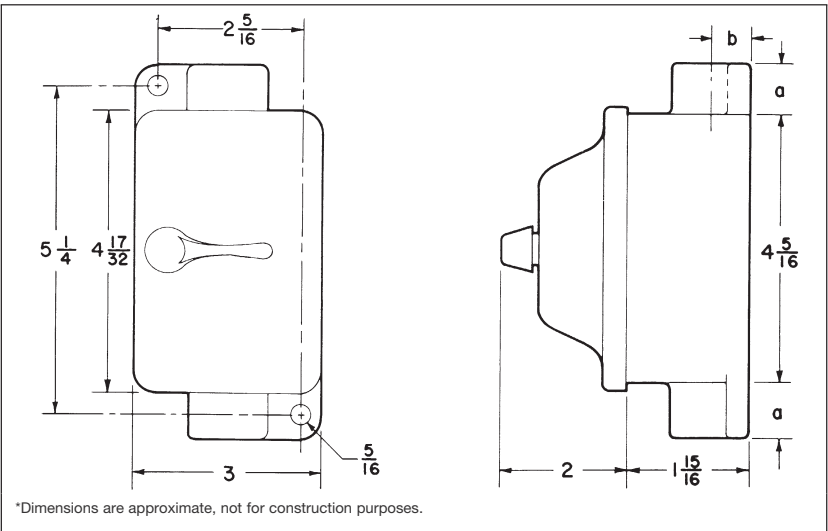


MC dead end



MCC through feed

## Dimensions In Inches\*:



| Hub Size | 1/2 | 3/4 |
|----------|-----|-----|
| a        | 7/8 | 7/8 |
| b        | 5/8 | 3/4 |



## MC Manual Motor Starting Switches

| Manufacturer  | Poles | Cat. # |
|---------------|-------|--------|
| Cutler-Hammer | 1     | MST01  |
| Cutler-Hammer | 2     | MST02  |

## Maximum Horsepower Ratings

| Volts        | 1-Pole | 2-Pole |
|--------------|--------|--------|
| 120 / 240 AC | 1      | 1      |
| 32 DC        | 1/4    | 1/4    |
| 120 / 240 DC |        | 1      |
| 240 DC       | 1/4    |        |

## Ordering Information - MC Single Gang (Dead End)

| Poles | Hub Size in. | Enclosure With Switch<br>Cat. # | Without Switch<br>Cat. # |
|-------|--------------|---------------------------------|--------------------------|
| 1     | 1/2          | MC1211 ①                        | MC1212B                  |
| 1     | 3/4          | MC2211 ①                        | MC2212B                  |
| 2     | 1/2          | MC1212 ①                        | MC1212B                  |
| 2     | 3/4          | MC2212 ①                        | MC2212B                  |

## Ordering Information - MCC Single Gang (Through Feed)

| Poles | Hub Size in. | Enclosure With Switch<br>Cat. # | Without Switch<br>Cat. # |
|-------|--------------|---------------------------------|--------------------------|
| 1     | 1/2          | MCC1211 ①                       | MCC1212B                 |
| 1     | 3/4          | MCC2211 ①                       | MCC2212B                 |
| 2     | 1/2          | MCC1212 ①                       | MCC1212B                 |
| 2     | 3/4          | MCC2212 ①                       | MCC2212B                 |

## Heater Table

| Full Load Motor Current | Heater Rating | Eaton's Crouse-Hinds Symbol Number |
|-------------------------|---------------|------------------------------------|
| .40 – .43               | .50           | W1                                 |
| .44 – .48               | .55           | W2                                 |
| .49 – .53               | .61           | W3                                 |
| .54 – .58               | .67           | W4                                 |
| .59 – .64               | .74           | W5                                 |
| .65 – .71               | .81           | W6                                 |
| .72 – .78               | .89           | W7                                 |
| .79 – .87               | .98           | W8                                 |
| .88 – .95               | 1.10          | W9                                 |
| .96 – 1.03              | 1.20          | W10                                |
| 1.04 – 1.15             | 1.30          | W11                                |
| 1.16 – 1.27             | 1.45          | W12                                |
| 1.28 – 1.35             | 1.60          | W13                                |
| 1.36 – 1.51             | 1.70          | W14                                |
| 1.52 – 1.67             | 1.90          | W15                                |
| 1.68 – 1.83             | 2.10          | W16                                |
| 1.84 – 1.99             | 2.30          | W17                                |
| 2.00 – 2.23             | 2.50          | W18                                |
| 2.24 – 2.47             | 2.80          | W19                                |
| 2.48 – 2.71             | 3.10          | W20                                |
| 2.72 – 2.95             | 3.40          | W21                                |
| 2.96 – 3.27             | 3.70          | W22                                |
| 3.28 – 3.59             | 4.10          | W23                                |
| 3.60 – 3.99             | 4.50          | W24                                |
| 4.00 – 4.39             | 5.00          | W25                                |
| 4.40 – 4.79             | 5.50          | W26                                |
| 4.80 – 5.26             | 6.00          | W27                                |
| 5.27 – 5.83             | 6.60          | W28                                |
| 5.84 – 6.39             | 7.30          | W29                                |
| 6.40 – 7.03             | 8.00          | W30                                |
| 7.04 – 7.74             | 8.80          | W31                                |
| 7.75 – 8.46             | 9.70          | W32                                |
| 8.47 – 9.35             | 10.60         | W33                                |
| 9.36 – 10.30            | 11.70         | W34                                |
| 10.31 – 11.35           | 12.90         | W35                                |
| 11.36 – 12.47           | 14.20         | W36                                |
| 12.48 – 13.67           | 15.60         | W37                                |
| 13.68 – 15.12           | 17.10         | W38                                |
| 15.13 – 16.00           | 18.60         | W39                                |

① Includes one interchangeable heater. Select heater from table above and use symbol number as second section of the Cat. No. Example: MC1211-W5. Symbol 0 (zero) may be used to indicate heater omitted.

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters.

# NSSC Series Manual Motor Starting Switches and NFS Series Fractional HP Starters and Enclosures

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

2C

## Applications:

- Motor Starting Switches are used in manual "ON" and "OFF" control of DC and single-phase or three-phase AC motors where overload protection is not required or is provided separately
- NFSC Fractional Horsepower Starters are used in manual "ON" and "OFF" control and overload protection of small single phase motors
- Both are suitable for use in wet and/or corrosive environments

## Features:

- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat
- Provided with a toggle lever with a molded-in stainless steel shaft
- Factory installed through feed (NSSC, NFSC) hubs, 1/2" or 3/4" size
- Indicating plate is made of stainless steel

## Certifications and Compliances:

- NEMA 3, 4X, and 12

## Options:

- Grounding plate or bushing – see page 677



## Ordering Information

### NSSC Series Manual Motor Starting Switch Without Overload Protection With Square D Switches

| Poles | Max. HP Rating |             |             | Max. Amp. Ratings |         |
|-------|----------------|-------------|-------------|-------------------|---------|
|       | 115 VAC        | 200–230 VAC | 460–575 VAC | 250 VDC           | 600 VDC |
| 2     | 1              | 2           | 3           | 30                | 20      |
| 3     | 2              | 7½          | 10          | 30                | 20      |

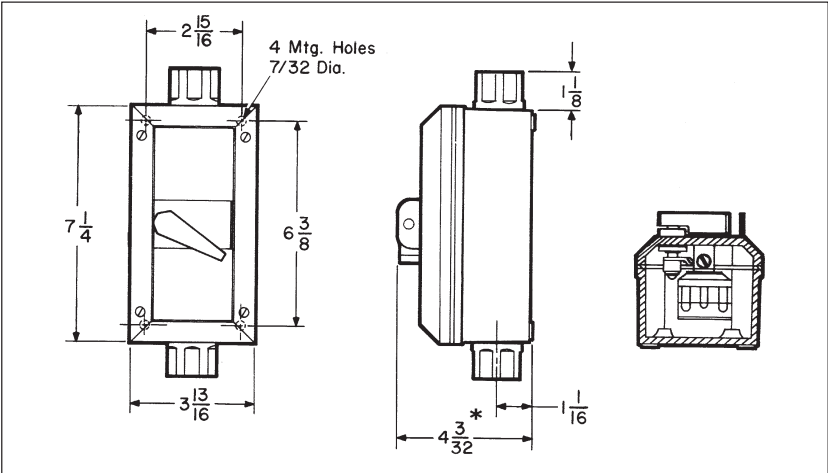
| Poles | Enclosure With Switch |                     |
|-------|-----------------------|---------------------|
|       | Hub Size              | Through Feed Cat. # |
| 2     | ½                     | NSSC D12            |
|       | ¾                     | NSSC D22            |
| 3     | ½                     | NSSC D13            |
|       | ¾                     | NSSC D23            |

### Enclosures Only

| Enclosure Type               | Hub Size | Through Feed Cat. # |
|------------------------------|----------|---------------------|
| Manual Motor Starting Switch | ½        | NSSC1               |
|                              | ¾        | NSSC2               |
| Fractional HP Starter        | ½        | NFSC1               |
|                              | ¾        | NFSC2               |

## Dimensions\*

In Inches:



\*Dimensions are approximate. Not to be used for construction purposes unless approved.

# NSSC Series Manual Motor Starting Switches and NFS Series Fractional HP Starters and Enclosures

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Ordering Information

### NFSC Series Fractional HP Starters With Overload Protection

#### With Allen-Bradley Bulletin 600 Switches

| Maximum HP Ratings |                     |                     |
|--------------------|---------------------|---------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC |
| 1                  | 1 hp                |                     |
| 2                  | 1 hp                | ¾ hp                |

| Enclosure With Starter |          |                            |
|------------------------|----------|----------------------------|
| Poles                  | Hub Size | Through Feed Cat. #        |
| 1                      | ½<br>¾   | NFSC AB11 ①<br>NFSC AB21 ① |
| 2                      | ½<br>¾   | NFSC AB12 ①<br>NFSC AB22 ① |

Heater Table (see pages 479-480)

#### With Cutler-Hammer Switches

| Maximum HP Ratings |                     |                     |
|--------------------|---------------------|---------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC |
| 1                  | 1 hp                |                     |
| 2                  | 1 hp                | 1 hp                |

| Enclosure With Starter |          |                          |
|------------------------|----------|--------------------------|
| Poles                  | Hub Size | Through Feed Cat. #      |
| 1                      | ½<br>¾   | NFSC C11 ①<br>NFSC C21 ① |
| 2                      | ½<br>¾   | NFSC C12 ①<br>NFSC C22 ① |

#### Heater Table (Cutler-Hammer)

| Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number | Max. Motor Full-Load Amps | Eaton's Crouse-Hinds Symbol Number |
|---------------------------|------------------------------------|---------------------------|------------------------------------|
| .43                       | W 1                                | 2.95                      | W21                                |
| .48                       | W 2                                | 3.27                      | W22                                |
| .53                       | W 3                                | 3.59                      | W23                                |
| .58                       | W 4                                | 3.99                      | W24                                |
| .64                       | W 5                                | 4.39                      | W25                                |
| .71                       | W 6                                | 4.79                      | W26                                |
| .78                       | W 7                                | 5.26                      | W27                                |
| .87                       | W 8                                | 5.83                      | W28                                |
| .95                       | W 9                                | 6.39                      | W29                                |
| 1.03                      | W10                                | 7.03                      | W30                                |
| 1.15                      | W11                                | 7.74                      | W31                                |
| 1.27                      | W12                                | 8.46                      | W32                                |
| 1.35                      | W13                                | 9.35                      | W33                                |
| 1.51                      | W14                                | 10.30                     | W34                                |
| 1.67                      | W15                                | 11.35                     | W35                                |
| 1.83                      | W16                                | 12.47                     | W36                                |
| 1.99                      | W17                                | 13.67                     | W37                                |
| 2.23                      | W18                                | 15.12                     | W38                                |
| 2.47                      | W19                                | 16.00                     | W39                                |
| 2.71                      | W20                                |                           |                                    |

#### With General Electric Switches

| Maximum HP Ratings |                |           |            |            |
|--------------------|----------------|-----------|------------|------------|
| Poles              | 115-230<br>VAC | 32<br>VDC | 115<br>VDC | 230<br>VDC |
| 1                  | 1 hp           | ¼ hp      | 1 hp       | ¼ hp       |
| 2                  | 1 hp           | ¼ hp      | 1 hp       | 1 hp       |

| Enclosure With Starter |          |                          |
|------------------------|----------|--------------------------|
| Poles                  | Hub Size | Through Feed Cat. #      |
| 1                      | ½<br>¾   | NFSC G11 ①<br>NFSC G21 ① |
| 2                      | ½<br>¾   | NFSC G12 ①<br>NFSC G22 ① |

Heater Table (see pages 479-480)

#### With Square D Switches

| Maximum HP Ratings |                     |                     |
|--------------------|---------------------|---------------------|
| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC |
| 1                  | 1 hp                |                     |
| 2                  | 1 hp                | ¾ hp                |

| Enclosure With Starter |          |                          |
|------------------------|----------|--------------------------|
| Poles                  | Hub Size | Through Feed Cat. #      |
| 1                      | ½<br>¾   | NFSC D11 ①<br>NFSC D21 ① |
| 2                      | ½<br>¾   | NFSC D12 ①<br>NFSC D22 ① |

#### Heater Table (Square D)

| Full-Load Motor Current | Eaton's Crouse-Hinds Symbol Number | Full-Load Motor Current | Eaton's Crouse-Hinds Symbol Number |
|-------------------------|------------------------------------|-------------------------|------------------------------------|
| 0.41-0.44               | A.49                               | 2.85-3.06               | A3.95                              |
| 0.45-0.49               | A.54                               | 3.07-3.45               | A4.32                              |
| 0.50-0.53               | A.59                               | 3.46-3.70               | A4.79                              |
| 0.54-0.58               | A.65                               | 3.71-4.07               | A5.30                              |
| 0.59-0.65               | A.71                               | 4.08-4.32               | A5.78                              |
| 0.66-0.71               | A.78                               | 4.33-4.90               | A6.20                              |
| 0.72-0.78               | A.86                               | 4.91-5.35               | A6.99                              |
| 0.79-0.85               | A.95                               | 5.36-5.85               | A7.65                              |
| 0.86-0.96               | A1.02                              | 5.86-6.41               | A8.38                              |
| 0.97-1.04               | A1.16                              | 6.42-6.79               | A9.25                              |
| 1.05-1.16               | A1.25                              | 6.80-7.57               | A9.85                              |
| 1.17-1.29               | A1.39                              | 7.58-8.15               | A11.0                              |
| 1.30-1.37               | A1.54                              | 8.16-8.98               | A11.9                              |
| 1.38-1.47               | A1.63                              | 8.99-9.67               | A13.2                              |
| 1.48-1.56               | A1.75                              | 9.68-9.95               | A14.1                              |
| 1.57-1.65               | A1.86                              | 9.96-10.8               | A14.8                              |
| 1.66-1.79               | A1.99                              | 10.9-12.1               | A16.2                              |
| 1.80-1.95               | A2.15                              | 12.2-13.1               | A17.9                              |
| 1.96-2.15               | A2.31                              | 13.2-13.9               | A19.8                              |
| 2.16-2.38               | A2.57                              | 14.0-15.0               | A21.3                              |
| 2.39-2.75               | A2.81                              | 15.1-16.0               | A25.2                              |
| 2.76-2.84               | A3.61                              |                         |                                    |

① Includes one interchangeable heater. Select heater suffix from table and add to catalog number. Example: NFSC-D11A.49

# NMN Series Manual Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

2C

### Applications:

- NMN manual line starters are for use in across-the-line starting of motors, motor protection and manual starting and stopping.

### Features:

- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat.
- Factory installed dead end (NMN) or through feed (NMNC) hubs, 3/4" and 1" sizes.

### Certifications and Compliances:

- NEMA/EEMAC 3, 4X and 12

### Electrical Rating Ranges:

- Starter sizes 0, 1, 1P

### Options:

- | Description                                                                                        | Suffix |
|----------------------------------------------------------------------------------------------------|--------|
| Undervoltage protection. Available with toggle operator only .....                                 | U      |
| Grounding plate – see page 677.                                                                    |        |
| Insulated, groundable type terminal block for grounded or ungrounded neutral can be supplied ..... | S618   |



Toggle-operated manual starter with knockout

2C

### Ordering Information

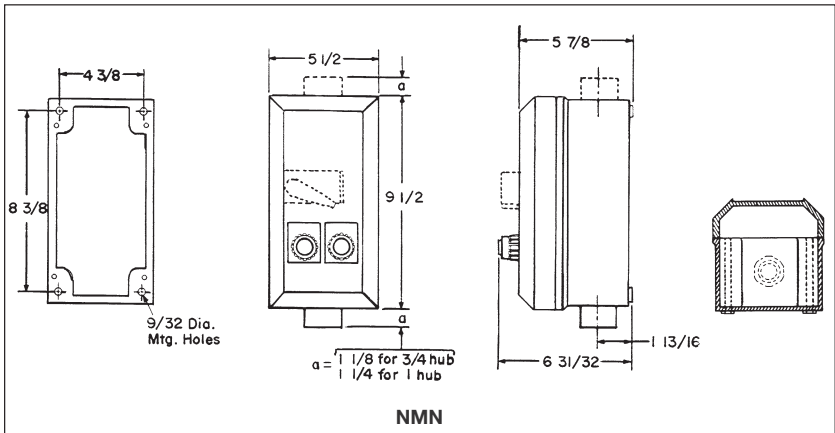
| Starter   |          |                               |  | Enclosure with Starter<br>3/4" Hubs |                       | 1" Hubs           |                       |
|-----------|----------|-------------------------------|--|-------------------------------------|-----------------------|-------------------|-----------------------|
| NEMA Size | Poles    | Max. HP<br>115V 230V 460/575V |  | Dead End<br>Cat #                   | Through Feed<br>Cat # | Dead End<br>Cat # | Through Feed<br>Cat # |
| M-0       | 2 (1 PH) | 1 2                           |  | NMN ①220                            | NMNC ①220             | NMN ①320          | NMNC ①320             |
| M-1       | 2 (1 PH) | 2 3                           |  | NMN ①221                            | NMNC ①221             | NMN ①321          | NMNC ①321             |
| M-1P      | 2 (1 PH) | 3 5                           |  | NMN ①221P                           | NMNC ①221P            | NMN ①321P         | NMNC ①321P            |
| M-0       | 3 (3 PH) | 2 3 5                         |  | NMN ①230                            | NMNC ①230             | NMN ①330          | NMNC ①330             |
| M-1       | 3 (1 PH) | 2 3                           |  | NMN ①231                            | NMNC ①231             | NMN ①331          | NMNC ①300             |
|           | 3 (3 PH) | 3 7 1/2 10                    |  |                                     |                       |                   |                       |
|           |          |                               |  | Enclosure Only*                     |                       |                   |                       |
|           |          |                               |  | NMN ①200                            | NMNC ①200             | NMN ①300          | NMNC ①300             |

①Motor Starters: Insert appropriate symbol in Cat. No.

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| General Electric | G      |
| Square D         | D      |

### Dimensions

In Inches:



\*Furnished with mounting plate and operator installed.

Crouse-Hinds  
by E.T.N

# NMG Series Magnetic Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Applications:

NMG magnetic line starters are used:

- For magnetic across-the-line starting of motors and remote starting and stopping
- For across-the-line starting of polyphase AC induction motors
- To provide motor running protection, undervoltage protection and remote starting and stopping

## Features:

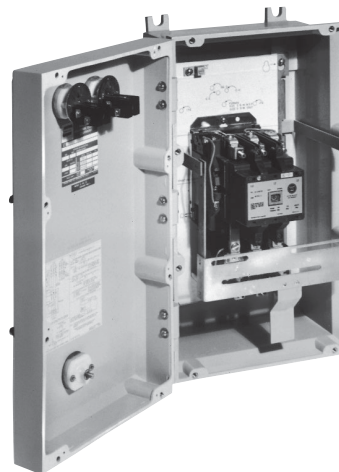
- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat.
- Unitized, strong and durable enclosure construction provides longer service life for equipment.
- Exterior parts of RESET button made of *Krydon* material.

## Certifications and Compliances:

- NEMA/EEMAC: 3, 4X and 12

## Electrical Rating Ranges:

- Starter sizes 0, 1, 2, 3, 4



Magnetic line starter with optional hinged cover with START-STOP pushbuttons.

## Options:

| Description                                                                                                                      | Suffix |
|----------------------------------------------------------------------------------------------------------------------------------|--------|
| Hinged cover.....                                                                                                                | NH     |
| Pilot lights, 120 V primary – specify other primary voltages as required:                                                        |        |
| Red pilot light.....                                                                                                             | J1*    |
| Green pilot light.....                                                                                                           | J3*    |
| LED pilot lights in place of standard incandescent pilot lamps.....                                                              | LED    |
| Pushbutton (heavy duty, uses two device holes):                                                                                  |        |
| START-STOP.....                                                                                                                  | PB13*  |
| Selector switches (heavy duty):                                                                                                  |        |
| ON-OFF.....                                                                                                                      | RR17*  |
| HAND-OFF-AUTO.....                                                                                                               | RR18*  |
| JOG-RUN-OFF.....                                                                                                                 | RR19*  |
| Padlock attachment for:                                                                                                          |        |
| Pushbutton.....                                                                                                                  | S708   |
| Control circuit transformer 480 / 240-120 volts, 50 or 60 hertz, (sizes 0 and 1-50VA, size 2-100VA, size 3-150VA, size 4-300VA): |        |
| Fusible                                                                                                                          |        |
| Secondary.....                                                                                                                   | FT     |
| Primary and Secondary.....                                                                                                       | FTPS   |
| Automatic reset overload relay.....                                                                                              | S1     |
| Less overload relays (contactor).....                                                                                            | C      |
| Auxiliary Contact on Starter or Contactor:                                                                                       |        |
| 1NO/1NC.....                                                                                                                     | S781   |
| 2NO/2NC.....                                                                                                                     | S782   |
| 3NO/3NC.....                                                                                                                     | S783   |

| Description                                                                                                                                                 | Suffix |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Time delay low voltage release for 3-wire control with 2, 4 or 6-second adjustment. For single-speed, non-reversing starters only. Control circuit voltage: |        |
| 120 volt, 60 hertz.....                                                                                                                                     | LVR1   |
| 240 volt, 60 hertz.....                                                                                                                                     | LVR2   |
| 480 volt, 60 hertz.....                                                                                                                                     | LVR3   |
| Hubs (see "Note on Hubs") – see page 677                                                                                                                    |        |
| Grounding plate or bushing† – see page 677                                                                                                                  |        |
| Insulated, groundable type terminal block for a grounded or ungrounded neutral can be supplied.....                                                         | S618   |
| Information on other options or combination of options for a specific enclosure size is available on request.                                               |        |

†Type GP grounding plate only in NMG0710 enclosure.

\*For optional devices or control circuit transformer, use next larger enclosure size. For NMG0714, two device holes maximum.

# NMG Series Magnetic Line Starters and Enclosures

600VAC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

2C

## Ordering Information

To order an enclosure complete with starter, insert the manufacturer's symbol in the designated position of the catalog number. Symbols are shown in the footnote at the bottom of this page. Specify HP, voltage, frequency, RPM, type and full load ampere rating of motor – or specify ampere rating of heaters.

Starters are furnished with three heaters. Enclosures only can be ordered. Select from listings.

| Single-Speed, Non-Reversing Motor Starter |            |           | Enclosure           |                        |
|-------------------------------------------|------------|-----------|---------------------|------------------------|
| Max. HP Polyphase                         | Volts (AC) | NEMA Size | With Starter Cat. # | Without Starter Cat. # |
| 2                                         | 120        | 0         | NMG0710 ①6130       | NMG0710                |
| 3                                         | 120        | 1         | NMG0710 ①6131       | NMG0710                |
| 3                                         | 240        | 0         | NMG0710 ①6230       | NMG0710                |
| 5                                         | 480        | 0         | NMG0710 ①6430       | NMG0710                |
| 5                                         | 600        | 0         | NMG0710 ①6530       | NMG0710                |
| 7½                                        | 120        | 2         | NMG0714 ①6132       | NMG0714                |
| 7½                                        | 240        | 1         | NMG0710 ①6231       | NMG0710                |
| 10                                        | 480        | 1         | NMG0710 ①6431       | NMG0710                |
| 10                                        | 600        | 1         | NMG0710 ①6531       | NMG0710                |
| 15                                        | 120        | 3         | NMG1018 ①6133       | NMG1018                |
| 15                                        | 240        | 2         | NMG0714 ①6232       | NMG0714                |
| 25                                        | 480        | 2         | NMG0714 ①6432       | NMG0714                |
| 25                                        | 600        | 2         | NMG0714 ①6532       | NMG0714                |
| 30                                        | 240        | 3         | NMG1018 ①6233       | NMG1018                |
| 50                                        | 240        | 4         | NMG1024 ①6234*      | NMG1024                |
| 50                                        | 480        | 3         | NMG1018 ①6433       | NMG1018                |
| 50                                        | 600        | 3         | NMG1018 ①6533       | NMG1018                |
| 100                                       | 480        | 4         | NMG1024 ①6434*      | NMG1024                |
| 100                                       | 600        | 4         | NMG1024 ①6534*      | NMG1024                |

\*NEMA Size 4 Allen-Bradley starter must be in NMG1426 enclosure.

① Motor Starters:

| Manufacturer     | Symbol |
|------------------|--------|
| Allen-Bradley    | AB     |
| Square D         | D      |
| Cutler-Hammer    | C      |
| General Electric | G      |
| Westinghouse     | W      |

Information on other starter manufacturers on request.

## Ordering Information when adding options

When adding options to NMG series enclosures, the base catalog number must be changed according to the table below.

| NEMA Size | Enclosure Cat. # | Enclosure w/Options |
|-----------|------------------|---------------------|
| 0, 1      | NMG0710          | NMG0714             |
| 2         | NMG0714          | NMG1018             |
| 3         | NMG1018          | NMG1024             |
| 4         | NMG1024          | NMG1426             |

**Example:** A NEMA size 4, 480 V Westinghouse starter with START-STOP pushbuttons would be Cat. No. NMG1426-W6434-PB13.

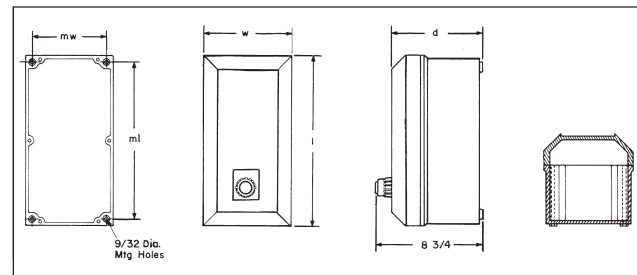
**Note on Hubs:** The following number and sizes of hubs (not mounted) are included when magnetic starters are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Starter Size | Number Included | Hub Size |
|--------------|-----------------|----------|
| 0            | 3               | ¾        |
| 1            | 1               | ¾        |
|              | 2               | 1        |
| 2            | 1               | ¾        |
|              | 2               | 1½       |
| 3            | 1               | ¾        |
|              | 2               | 2        |
| 4            | 1               | ¾        |
|              | 2               | 2½       |

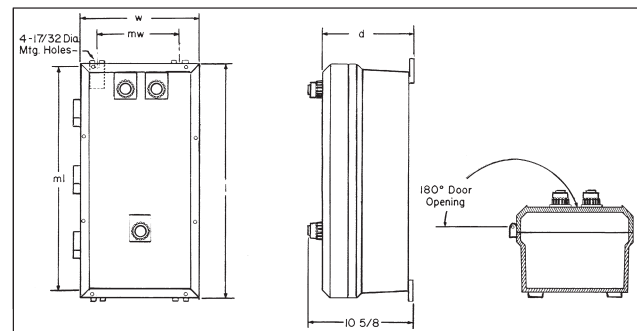
## Crouse-Hinds

by **E•T•N**

## Dimensions† In Inches:



NMG0710 & 0714



NMG1018 & 1024

| Enclosure Cat. # | Outside Dimensions |        |       | Mounting Dimensions |    |
|------------------|--------------------|--------|-------|---------------------|----|
|                  | l                  | w      | d     | ml                  | mw |
| NMG0710          | 10½                | 7½     | 7     | 9⅞                  | 6⅞ |
| NMG0714          | 14½                | 7½     | 7     | 13⅜                 | 6⅞ |
| NMG1018          | 19⅓/32             | 11⅓/32 | 8⅓/32 | 19⅞                 | 7⅞ |
| NMG1024          | 25⅓/32             | 11⅓/32 | 8⅓/32 | 25⅞                 | 7⅞ |

†Not to be used for construction purposes unless approved.

2C





| Description                                               | Page No.          |
|-----------------------------------------------------------|-------------------|
| <b>Application/Selection</b>                              | see page 492      |
| <b>Auxiliary Circuit Breakers &amp; Enclosures</b>        |                   |
| EFD, EFDC Series                                          | see page 507      |
| <b>Thermal Magnetic Circuit Breakers &amp; Enclosures</b> |                   |
| <b>General Information and Dimensions</b>                 |                   |
| EPC Series                                                | see pages 498–499 |
| FLB Series                                                | see page 502      |
| EBMB Series                                               | see pages 494–497 |
| <b>Non-Interchangeable Trip</b>                           |                   |
| <b>100 / 150 ampere frame</b>                             |                   |
| EPC Series                                                | see page 500      |
| FLB Series                                                | see page 503      |
| EBMB Series                                               | see pages 494–495 |
| EIB Series                                                | see page 493      |
| NCB Series                                                | see page 508      |
| <b>225 / 250 ampere frame</b>                             |                   |
| FLB Series                                                | see page 506      |
| EBMB Series                                               | see pages 494–495 |
| NCB Series                                                | see page 508      |
| <b>400 ampere frame</b>                                   |                   |
| EBMB Series                                               | see pages 494–495 |
| <b>Interchangeable Trip</b>                               |                   |
| <b>225 / 250 ampere frame</b>                             |                   |
| FLB Series                                                | see page 506      |
| EBMB Series                                               | see pages 494–495 |
| <b>400 ampere frame</b>                                   |                   |
| EBMB Series                                               | see pages 494–495 |
| NCB Series                                                | see page 508      |
| <b>600 / 800 ampere frame</b>                             |                   |
| EBMB Series                                               | see pages 494–495 |
| <b>1000 ampere frame</b>                                  |                   |
| EBMB Series                                               | see pages 494–495 |

### Application and Selection Quick Selector Chart

#### Applications:

Circuit breakers and their appropriate enclosures are used:

- In conjunction with service entrance, lighting, heating, appliance and motor protection circuits
- To provide disconnect means
- For short circuit protection and thermal time delay overload protection
- In various types of damp, wet, corrosive and hazardous areas

#### Considerations for Selection:

Considerations for selection of proper enclosure:

- The environment of the enclosure location in terms of NEC/CEC compliance and NEMA/EEMAC type required
- The size and type of circuit breaker required for the particular application
- See "Quick Selector" below for guidance

#### Options:

Many options are available on:

- Material and finishes where special atmospheric conditions prevail
- Special features for specific applications. See individual listings for available options

#### Quick Selector Chart

| Enclosures for Circuit Breakers |                                                                                                               |                        |                  |                     |                                  |                                                                                                                        |              |                        |                                |
|---------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------|------------------|---------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------|------------------------|--------------------------------|
|                                 |                                                                                                               |                        | Circuit Breaker  |                     |                                  |                                                                                                                        |              |                        |                                |
| Encl.                           | NEC/CEC – Hazardous Area Certifications and Compliances                                                       | NEMA/ EEMAC Encl. Type | Type             | Ampere Rating Range | Voltage Range                    | Manufacturer and Frame Size                                                                                            | No. of Poles | Inter-change-able Trip | Enclosure Cover Construction   |
| EFD, EFDC                       | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7BCD, 9EFG          | Thermal-Magnetic | 15–30               | 120AC                            | Sq. D – QOU                                                                                                            | 1            | No                     | Bolted/ Ground Joint           |
| EBMB                            | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3R, 4, 7BCD, 9EFG, 12  | Thermal-Magnetic | 15–800              | 120AC to 600AC<br>125DC to 250DC | G.E. – TEB, TED, TFJ, TFK, TJJ, TJK, TKMA<br>Sq. D – FAL, KAL, LAL, MAL<br>Cut.-Ham. – EHD, FD, FDB, JD, JDB, KD, KDB, | 1, 2, 3      | Yes                    | Bolted/ Ground Joint/ Gasketed |
| EPC                             | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III    | 3, 4, 7CD, 9EFG        | Thermal-Magnetic | 15–150              | 120AC to 600AC<br>125DC to 250DC | G.E. – TEB, TED, TFJ<br>Sq. D – FAL, KAL<br>Cut.-Ham. – EHD, FD, FDB, JD, JDB                                          | 1, 2, 3      | Yes                    | Threaded                       |
| FLB                             | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III    | 3, 7CD, 9EFG           | Thermal-Magnetic | 15–225              | 120AC to 600AC<br>125DC to 250DC | G.E. – TEB, TED, TFJ, TFK<br>Sq. D – FAL, KAL<br>Cut.-Ham. – EHD, FD, FDB, JD, JDB                                     | 1, 2, 3      | Yes                    | Threaded                       |
| EIB                             | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. I, Zones 1 & 2<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. III          | 3, 3R, 4, 7BCD, 9EFG   | Magnetic         | 15–100              | 480AC to 600AC                   | Cut. Ham. – EG                                                                                                         | 3            | No                     | Bolted/ Ground Joint           |
| NCB                             | N/A                                                                                                           | 3, 4X, 12              | Thermal-Magnetic | 15–400              | 240AC to 600VAC<br>250DC         | G.E. – TEB, TED, TFJ<br>Sq. D – FAL, KAL, LAL<br>Cut.-Ham. – EB, EHB, EHD, FD, FDB, JD, JDB                            | 2, 3         | Yes                    | Hinged, screw and gasket       |

## EIB Series

### Compact Circuit Breaker Assemblies With Covers

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. I, Zones 1 & 2  
Cl. II, Div. 1, Groups E, F, G  
Cl. III  
NEMA 3, 3R, 4, 7BCD, 9EFG  
UL Standard: 1203 cUL to CSA C22.2 No. 30

3C

The EIB Series Compact Circuit Breaker Assemblies are an innovative line of explosionproof motor control now being offered by Eaton's Crouse-Hinds. The EIB series utilizes the EJB style D enclosure with its bolted construction, NEMA 4 environmental protection and Class I, Division 1, Group B, C and D hazardous area ratings. The EIB series is a cost-effective solution for circuit breaker protection and utilizes the Cutler-Hammer Type EG circuit breakers. Circuit breaker protection is available from 15 to 100 amps.

#### Features:

- Small compact footprint requires less mounting space and reduces enclosure cost
- Rotary handle operator mounted on cover assembly provides clear indication of on, off and trip positions
- No internal fork operator, eliminating potential damage to breaker toggle
- Trip position easily identified from a distance
- Neoprene cover gasket provides UL Type 4 (hose-tight) environmental rating
- Detachable mounting feet offer flexible mounting alternatives - no need to replace the entire enclosure if a mounting foot is broken
- Stainless steel hinges provide extreme durability and easy access to inside of enclosure for wiring and maintenance
- (2) 1½" NPT conduit entries, one on top and one on bottom for easy top or bottom feed of conductors. For field addition of breather and/or drain; holes come plugged

#### Certifications and Compliances:

- Class I, Divisions 1 & 2, Groups B, C & D
- Class I, Zones 1 & 2
- Class II, Division 1, Groups E, F and G
- Class III
- Enclosure type 3, 3R, 4, 7BCD, 9EFG
- NEMA 3, 3R, 4, 7BCD, 9EFG
- UL Standard 1203
- cUL to CSA C22.2 No. 30

#### Standard Materials:

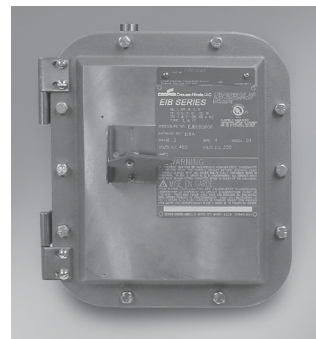
- Body and Cover – Copper-free aluminum
- Gasket – Neoprene
- Cover Bolts – Steel
- Hinges – Stainless Steel
- Mounting Plate Sheet – Aluminum

#### Finishes:

- Copper-free Aluminum – Natural
- Steel – Electro-galvanized

#### Options:

| Description                                                           | Suffix |
|-----------------------------------------------------------------------|--------|
| Insulated Neutral Lug .....                                           | S146   |
| Grounded Neutral Lug Kit with Connectors for 50, 100 & 225 Amps ..... | S178   |
| External Ground Stud .....                                            | S214   |
| Breather and Drain .....                                              | S756V  |
| Epoxy Powder Coat Finish (exterior only) .....                        | S752   |
| Epoxy Powder Coat Finish (exterior and interior) .....                | S753   |



#### Ordering Information

| Circuit Breaker Rating (amps) | Enclosure Only | Enclosure with Circuit Breaker |
|-------------------------------|----------------|--------------------------------|
| 15                            | EIBA           | EIBA3015                       |
| 20                            | EIBA           | EIBA3020                       |
| 25                            | EIBA           | EIBA3025                       |
| 30                            | EIBA           | EIBA3030                       |
| 35                            | EIBA           | EIBA3035                       |
| 40                            | EIBB           | EIBB3040                       |
| 45                            | EIBB           | EIBB3045                       |
| 50                            | EIBB           | EIBB3050                       |
| 60                            | EIBB           | EIBB3060                       |
| 70                            | EIBB           | EIBB3070                       |
| 80                            | EIBB           | EIBB3080                       |
| 90                            | EIBB           | EIBB3090                       |
| 100                           | EIBB           | EIBB3100                       |

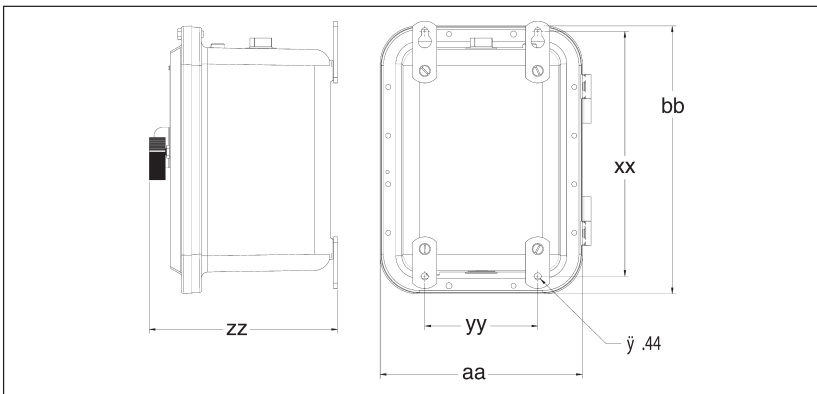
#### Electrical Ratings:

- 600V maximum
- 3 poles
- Ampere Interrupting Capacity:
  - All EIB enclosures are rated to 10k AIC
  - Eaton Type EG Breaker AIC ratings:
    - 240V: 35k AIC
    - 480V: 25k AIC
    - 600V: 18k AIC

#### Weights:

|      |         |
|------|---------|
| EIBA | 39 lbs. |
| EIBB | 58 lbs. |

#### Dimensions In Inches:



| Dimension      | Size A | Size B |
|----------------|--------|--------|
| aa             | 10.47" | 12.53" |
| bb             | 12.47" | 16.53" |
| xx             | 11.13" | 15.13" |
| yy             | 5.0"   | 7.0"   |
| zz             | 9.6"   | 11.66" |
| Mounting Holes | 7/16"  | 7/16"  |

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 3R, 4 $\pm$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

## Applications:

Spectrum™ EBM hinged cover motor control enclosures are used:

- For general motor control and circuit protection – indoors and outdoors – in damp, wet, dirty, dusty hazardous locations without the need for a protective shelter.
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent.
- To provide line disconnect means and short circuit protection.
- For service entrance, feeder or branch circuit protection for lighting, heating, appliance and motor circuits.
- On switchracks or other assemblies where it's desired that motor control be centrally located.

## Features:

- Rugged, corrosion resistant, cast copper-free aluminum construction (less than 0.4 of 1%).
- Circuit breaker operating handle located through the right side wall of the body permits visual confirmation of correct component assembly and operation.
- Total compliance to the wiring end room requirements of the National Electrical Code®.
- Semi-clamshell enclosure design, with an external flanged ground joint between body and cover makes interior components more accessible.
- Minimum enclosure-to-enclosure spacing with little interference between the opened cover and an adjacent enclosure.
- Copper-free aluminum hinges allow the cover to swing well out of the way.
- Stainless steel, quick release, captive, hex head cover bolts. Stainless steel springs provide clear indication cover bolts are fully retracted from body.
- Versatile, internal operating mechanisms allow for field adjustment to accommodate popular manufacturers' breakers.
- Simple, straightforward installation of breaker on pre-drilled mounting plate within enclosure. Mounting plate also field removable.
- Circuit breaker external operating handle can be padlocked in either "ON" or "OFF" positions.
- Neoprene cover gasket permanently attached to the cover seals out moisture.
- Bodies have top and bottom drilled and tapped entrances for power conduits and control conduits. Removable reducers are supplied, as standard, to accommodate smaller size conduits. All conduit entrances are plugged.
- Tap-on mounting feet.
- Optional EMPS control devices may be added to enclosure cover.
- Steel bracket for lifting larger enclosures during installation supplied as standard.



**Spectrum EBM motor control enclosures accommodate popular makes of circuit breakers.**

## Certifications and Compliances:

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- UL Standards UL1203 – Hazardous (classified) locations/CSA Standards: C22.2 No. 30
- UL Subject 2062 - High AIC rating (Interrupting Capacity) For Groups C & D only
  - 240V 65,000 RMS Symm. Amperes
  - 480V 50,000 RMS Symm. Amperes
  - 600V 25,000 RMS Symm. Amperes
- NEMA 3, 3R, 4 $\pm$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

## Standard Materials:

- Body and cover – copper-free aluminum
- Operating handle – copper-free aluminum
- Operating shaft and bushing – stainless steel
- Interior parts – sheet steel, electrogalvanized
- Cover bolts, washers and retractile springs – stainless steel

## Electrical Rating Ranges:

- Circuit breakers – 100, 150, 225, 250, 400, 600, 800, 1000\* ampere frame sizes

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

††With S752 or S753.

\*1000 Ampere Frame (max. 800 ampere trip)

National Electrical Code is a Registered Trademark of The National Fire Protection Association.

# EBMB Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\ddagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**3C**

## Options:

The following options are available from factory by adding suffix to catalog number. Suffixes are added alphanumerically.

### Catalog Number System

EBMBB-①-WT30FDB36-②

① Options in this position are additions to the enclosure and should be listed alphanumerically.

② Options in this position are modifications to the circuit breaker and should be listed alphanumerically.

| Description                                                                                          | Position in Cat. # | Suffix           |
|------------------------------------------------------------------------------------------------------|--------------------|------------------|
| Ambient compensated circuit breaker trip setting.....                                                | ②                  | AC               |
| Pilot light, 120VAC, red jewel, w/blank indicating plate.....                                        | ①                  | J1 $\ddagger$    |
| Pilot light, 120VAC, green jewel, w/blank indicating plate.....                                      | ①                  | J3 $\ddagger$    |
| LED pilot lights in place of standard incandescent pilot lamps.....                                  | ①                  | LED              |
| Start-stop pushbuttons (requires 2 spaces).....                                                      | ①                  | PB23 $\ddagger$  |
| Space heater, 120 volt, 25 watts.....                                                                | ①                  | R11              |
| Space heater, 240 volt, 25 watts.....                                                                | ①                  | R22              |
| Space heater, 480 volt, 25 watts.....                                                                | ①                  | R44              |
| Insulated neutral w/2 connectors.....                                                                | ①                  | S146             |
| Grounded neutral stud w/3 connectors (50, 100, 225 amp).....                                         | ①                  | S178             |
| Std. drain, Class I, B, C & D; Class II, E F & G, Class III.....                                     | ①                  | S756 $\ddagger$  |
| Std. breather & drain, Class I, B, C & D; Class II, E, F & G; Class III.....                         | ①                  | S756V $\ddagger$ |
| External epoxy finish.....                                                                           | ①                  | S752             |
| Internal and external epoxy finish.....                                                              | ①                  | S753             |
| Aux. switch on circuit breaker, 1A & 1B contacts.....                                                | ②                  | S784             |
| Aux. switch on circuit breaker, 2A & 2B contacts.....                                                | ②                  | S785             |
| 12 point term. block – 30 amp, 300 V.....                                                            | ①                  | S786             |
| General purpose control relay, 4 pole N.O., contacts rated 10A @ 600V, coil 120VAC, 50–60 Hertz..... | ①                  | S787             |



EBMB Series circuit breaker enclosures are available with breakers from 100 to 1000\* amp frame sizes.

**3C**

\*1000 Ampere Frame (max. 800 ampere trip.)

$\ddagger$ If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings and DSL Legend Plate listings see page 449.

$\ddagger$ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\ddagger\ddagger$ With S752 or S753.

# 3C EBMB Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

## Ordering Information:

- To order an enclosure complete with circuit breaker, insert the manufacturer's symbols in the designated positions of the catalog number. Symbols are shown below.
- Enclosures can be ordered without circuit breakers. Select from listings below.

## EBMB Series Enclosures for Circuit Breakers

### Circuit Breaker

### Enclosures

| Poles $\ddagger$ | Voltage Rating       | Circuit Breaker Frame Size | Without Circuit Breaker Cat. # | Circuit Breaker Amp Rating | With Circuit Breaker Cat. #                |
|------------------|----------------------|----------------------------|--------------------------------|----------------------------|--------------------------------------------|
| 3                | 240VAC or 125–250VDC | 100 Amp. Frame             | EBMBA *                        | 15A through 70A            | EBMBA TT $\circledast$ TEB32               |
| 3                | 240VAC or 125–250VDC | 150 Amp. Frame             | EBMBA $\dagger$ §              | 10A through 70A            | EBMBA TT $\circledast$ TEB32               |
| 3                | 480VAC or 250VDC     | 100 Amp. Frame             | EBMBA *                        | 15A through 70A            | EBMBA $\circledast$ 2 $\circledast$ 334    |
| 3                | 480VAC or 250VDC     | 150 Amp. Frame             | EBMBA $\dagger$ §              | 10A through 70A            | EBMBA TT $\circledast$ TED34               |
| 3                | 600VAC               | 150 Amp. Frame             | EBMBA $\dagger$ § ■            | 10A through 70A            | EBMBA $\circledast$ 2 $\circledast$ 336    |
| 3                | 240VAC or 125–250VDC | 100 Amp. Frame             | EBMBB *                        | 15A through 100A           | EBMBB TT $\circledast$ TEB32               |
| 3                | 240VAC or 125–250VDC | 150 Amp. Frame             | EBMBB $\dagger$ §              | 10A through 150A           | EBMBB TT $\circledast$ TEB32               |
| 3                | 480VAC or 250VDC     | 100 Amp. Frame             | EBMBB *                        | 15A through 100A           | EBMBB $\circledast$ 2 $\circledast$ 334    |
| 3                | 480VAC or 250VDC     | 150 Amp. Frame             | EBMBB $\dagger$ §              | 10A through 150A           | EBMBB TT $\circledast$ TED34               |
| 3                | 600VAC               | 150 Amp. Frame             | EBMBB $\dagger$ § ■            | 15A through 150A           | EBMBB $\circledast$ 2 $\circledast$ 336    |
| 3                | 600VAC               | 250 Amp. Frame             | EBMBG $\circledast$ ▲          | 70A through 250A           | EBMBG $\circledast$ 2 $\circledast$ 336    |
| 3                | 600VAC or 250VDC     | 400 Amp. Frame             | EBMBK ▼                        | 100A through 400A          | EBMBK $\circledast$ 2 $\circledast$ 336    |
| 3                | 600VAC or 250VDC     | 600 Amp. Frame             | EBMBL ♦                        | 250A through 600A          | EBMBL WT $\circledast$ 2 $\circledast$ 336 |
| 3                | 600VAC or 250VDC     | 800 Amp. Frame             | EBMBL ♥                        | 300A through 800A          | EBMBL WT $\circledast$ 2 $\circledast$ 336 |

### ①Circuit Breakers:

| Manufacturer     | Symbol |
|------------------|--------|
| Cutler-Hammer    | WT     |
| General Electric | TT     |

### ② Select Trip Setting from below:

100 Amp. Frame (EHD)\* – 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100  
150 Amp. Frame (TDB, TEB, TED) $\dagger$ § – 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150  
225 / 250 Amp. Frame (JD, JDB, TFJ, TFK) $\circledast$ ▲ – 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250  
400 Amp. Frame (KD, KDB, TJJ, TJK)▼ – 100, 125, 150, 175, 200, 225, 250, 300, 350, 400  
600 Amp. Frame (LD, TJK)♦ – 250, 300, 350, 400, 450, 500, 600  
800 Amp. Frame (MD, TKMA)♥ – 300, 350, 400, 450, 500, 600, 700, 800

### ③Select Circuit Breaker Frame Type based on frame size, voltage, and manufacturer desired:

| Manufacturer     | 100 Amp. Frame<br>240VAC | 100 Amp. Frame<br>480VAC | 600VAC | 150 Amp. Frame<br>240VAC | 150 Amp. Frame<br>480VAC | 600VAC | 250 Amp. Frame<br>600VAC $\circledast$ ▲ | 400 Amp. Frame<br>600VAC               | 600 Amp. Frame<br>600VAC | 800 Amp. Frame<br>600VAC |
|------------------|--------------------------|--------------------------|--------|--------------------------|--------------------------|--------|------------------------------------------|----------------------------------------|--------------------------|--------------------------|
| Cutler-Hammer    | —                        | EHD                      | —      | —                        | —                        | FDB    | JD $\circledast$<br>JDB $\circledast$    | KD $\circledast$<br>KDB $\circledast$  | LD                       | MD                       |
| General Electric | TEB                      | —                        | —      | —                        | TED                      | TED    | TFK $\circledast$<br>TFJ $\circledast$   | TJK $\circledast$<br>TJJ $\circledast$ | TJK                      | TKMA                     |

$\circledast$ —Interchangeable Trip Unit

♦—Non-Interchangeable Trip Unit

$\ddagger$  Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.

$\dagger\dagger$ With S752 or S753.

$\circledast$  Depending on availability from the circuit breaker manufacturer 1 and 2 pole can be furnished. Information available upon request. Example of an adjusted part number - EBMBB WT100EDH34 becomes EBMBB WT100EDH24.

\* EBMBA will accept 15 through 70 amp. trip, EBMBB will accept 15 through 100 amp. trip.

$\dagger$  EBMBA will accept 10 through 70 amp. trip, EBMBB will accept 10 through 150 amp. trip.

§ General Electric TEB frame available 10 through 100 amp. trip. TED frame available 10 through 150 amp. trip.

■ Westinghouse FDB frame available 15 through 150 amp. trip.

$\circledast$  General Electric TFJ and TFK types are 225 amp. frame, available 70 through 225 amp. trip.

▲ Westinghouse JD and JDB types are 250 amp. frame, available 70, 90, 100 and 125 through 250 amp. trip.

▼ Westinghouse KD and KDB frames available 100 through 400 amp. trip. General Electric TJJ and TJK frames available 125 through 400 amp. trip.

♦ Westinghouse LD frame available 300 through 400 and 500, 600 amp. trip.

♥ Westinghouse MD frame available 400 and 500 through 800 amp. trip.



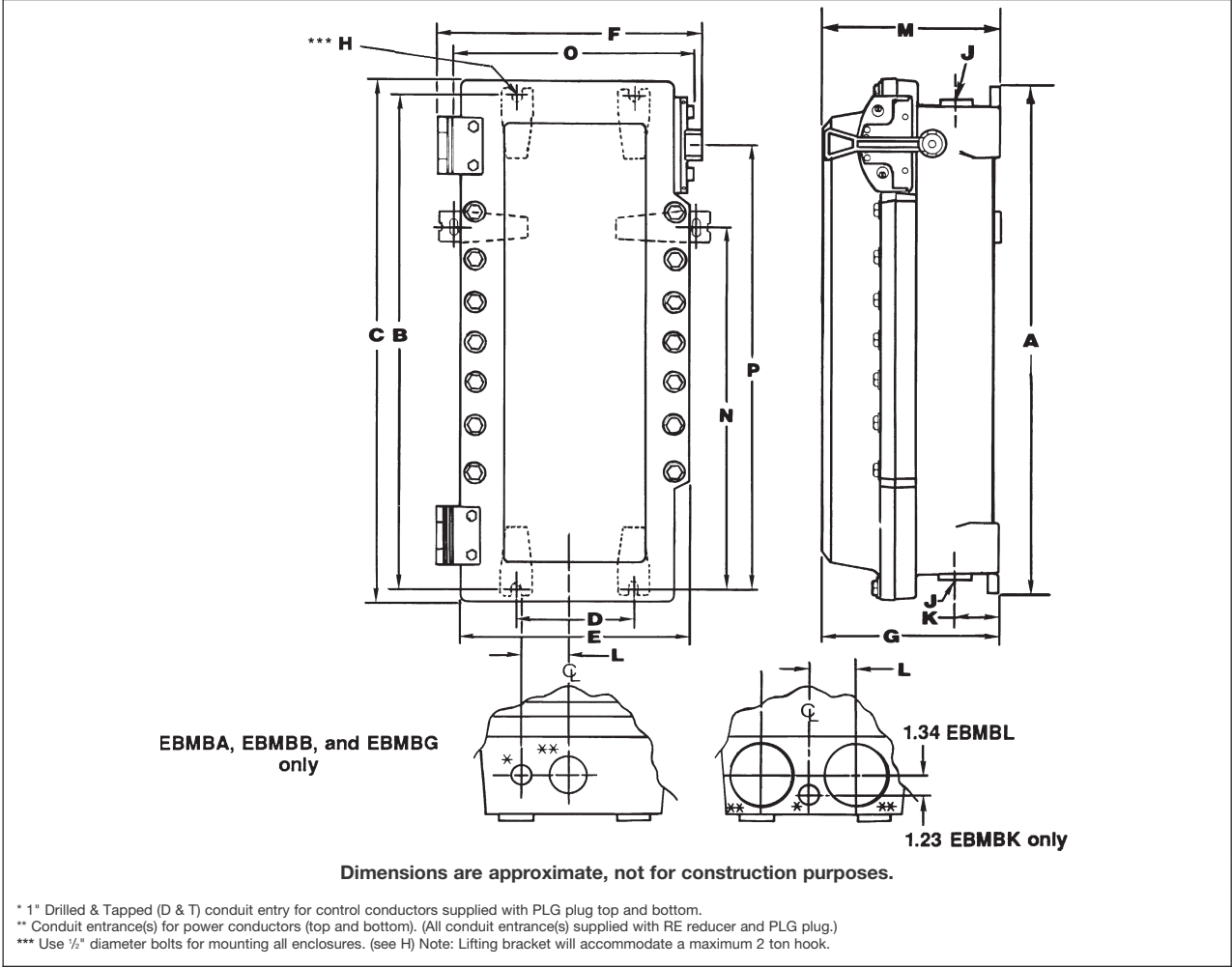
EBMB Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 3R, 4 $\ddagger$ , 4X $\dagger\dagger$ , 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

3C

Dimensions  
In Inches:



| Enclosure<br>Only<br>Cat. #  | Enclosure<br>Size<br>Symbol | Dimensions |       |       |       |       |       |       |       | J** Conduit<br>Entry Trade<br>Size<br>D&T§ |      | Dimensions |       |       |       |       |  |  |
|------------------------------|-----------------------------|------------|-------|-------|-------|-------|-------|-------|-------|--------------------------------------------|------|------------|-------|-------|-------|-------|--|--|
|                              |                             | A          | B     | C     | D     | E     | F     | G     |       | w/RE                                       | K    | L          | M     | N     | O     | P     |  |  |
| 100 Amp Frame                |                             |            |       |       |       |       |       |       |       |                                            |      |            |       |       |       |       |  |  |
| EBMBA                        | A                           | 18.25      | 17.25 | 19.40 | 6.00  | 13.03 | 14.78 | 10.25 | 2"    | 1.5"                                       | 3.25 | 3.13       | 10.25 | —     | —     | 14.50 |  |  |
| 100 and 150 Amp Frame        |                             |            |       |       |       |       |       |       |       |                                            |      |            |       |       |       |       |  |  |
| EBMBB                        | B                           | 25.75      | 24.75 | 26.90 | 6.00  | 13.03 | 14.78 | 10.25 | 2"    | 1.5"                                       | 3.25 | 3.13       | 10.25 | —     | —     | 22.00 |  |  |
| 225 and 250 Amp Frame        |                             |            |       |       |       |       |       |       |       |                                            |      |            |       |       |       |       |  |  |
| EBMBG                        | G                           | 37.50      | 36.50 | 39.28 | 6.00  | 13.03 | 14.78 | 10.25 | 3.0"  | 2.5"                                       | 3.25 | 3.13       | 10.25 | —     | —     | 34.06 |  |  |
| 400 Amp Frame                |                             |            |       |       |       |       |       |       |       |                                            |      |            |       |       |       |       |  |  |
| EBMBK                        | K                           | 43.12      | 41.50 | 42.65 | 12.00 | 17.65 | 20.28 | 10.92 | (2)3" | (2)2.5"                                    | 3.25 | 3.00       | 10.92 | —     | —     | 29.23 |  |  |
| 600, 800 and 1000 Amp Frame† |                             |            |       |       |       |       |       |       |       |                                            |      |            |       |       |       |       |  |  |
| EBMBL                        | L                           | 53.25      | 51.50 | 53.28 | 12.00 | 17.90 | 20.58 | 13.03 | (2)4" | (2)3.5"                                    | 4.00 | 3.50       | 13.13 | 41.50 | 18.40 | 29.88 |  |  |

†1000 Ampere Frame (max. 800 ampere trip)  
‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators. Breather and drain entries must be plugged for NEMA 4 rating.  
††With S752 or S753.  
§Drilled & Tapped.



|                                |                    |
|--------------------------------|--------------------|
| Cl. I, Div. 1 & 2, Groups C, D | Explosionproof     |
| Cl. II, Div. 1, Groups E, F, G | Dust-Ignitionproof |
| Cl. II, Div. 2, Groups F, G    | Raintight          |
| Cl. III                        | Wet Locations      |
| NEMA 3, 4, 7CD, 9EFG           | Watertight         |

## Applications:

EPC Circuit Breakers and Enclosures are used:

- For service entrance\*, feeder or branch circuit protection for lighting, heating, appliance and motor circuits
- In areas made hazardous due to the presence of flammable vapors, gases or combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical or petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnect means, short circuit protection and thermal time delay overload protection

## Features:

- Quick-opening covers – less than two turns to remove or install
- Three section design for ease of installation
- Water-shedding construction with female threads on top cover, male threads on bottom cover, and top cover skirted
- Specially located stops and locks insure adequate thread engagement and prevent overtightening
- Separate replaceable mounting bracket attached to the rear of the body provides three-point suspension for quick installation and leveling – one keyhole slot at top and two open slots at bottom
- Bodies have two taper-tapped conduit hubs with integral bushings on the top, and two more directly below
- Mounting plates are supplied with all necessary holes and hardware to attach any of the circuit breakers shown in the catalog listings. Breaker and interior mounting frames are easily removed as a unit, providing free access to the wiring chamber
- Breaker is operated by an external handle which can be padlocked in either "ON" or "OFF" positions by as many as three padlocks. Breaker is trip-free of the handle and will open under short circuit or overload, even if the handle is locked in the "ON" position

## Certifications and Compliances:

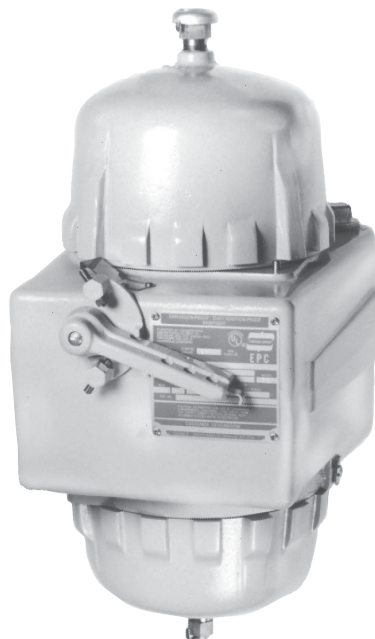
- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 4, 7CD, 9EFG
- UL Standard: 698
- CSA: C22.2 No. 30

## Standard Materials:

- Bodies and covers – copper-free aluminum
- Operating handles – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – electrogalvanized



## Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                                  | Suffix  |
|----------------------------------------------------------------------------------------------|---------|
| Auxiliary Switch†                                                                            |         |
| 1A/1B (1P2T).....                                                                            | S784    |
| 2A/2B (2P2T).....                                                                            | S785    |
| Insulated neutral with 2 connectors (100, 150 and 225 amp.)                                  | S146    |
| Grounded neutral stud with 3 connectors (100, 150 and 225 amp.).....                         | S178    |
| Side bosses drilled and tapped same size as standard hubs.                                   | S366    |
| Back boss drilled and tapped same size as standard hubs...                                   | S367    |
| Standard Breather (Class I, Groups C, D; Class II, Groups E, F, G; Class III).....           | S219    |
| Standard Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III).....              | S198    |
| Standard Breather and Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III)..... | S198V   |
| Universal Breather-Drain (Class I, Groups C, D; Class II, Groups F, G).....                  | S454\$  |
| (2) Universal Breather-Drains (Class I, Groups C, D; Class II, Groups F, G).....             | S454V\$ |

## Electrical Rating Ranges:

- 100, 150, 225, 250 ampere frame sizes

\*Suffix S146 insulated material must be used to comply with NEC requirements for service entrance.

†Application is limited by circuit breaker design – Consult Factory.

\$Not suitable for NEMA 4.

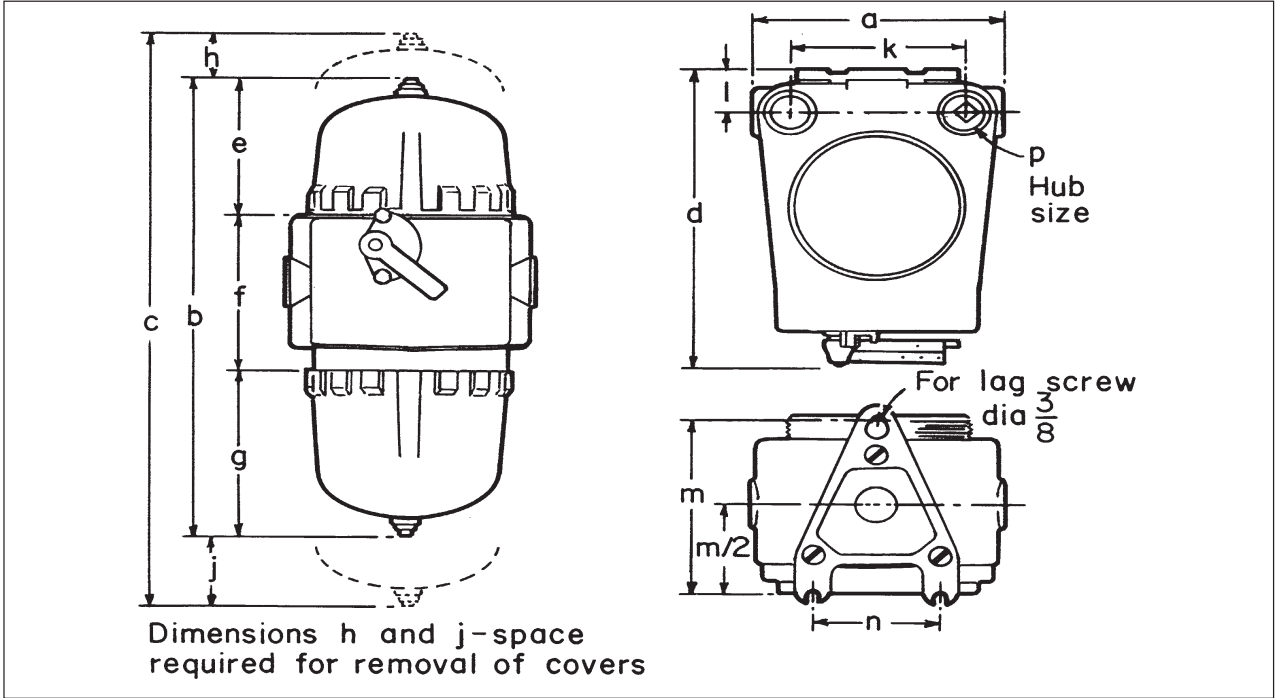
# EPC Series Circuit Breakers and Enclosures

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

3C

## Dimensions In Inches\*



|           | EPC377                           | EPC387                           |
|-----------|----------------------------------|----------------------------------|
| Int. Dia. | 7"                               | 7"W                              |
| a         | 10 <sup>5</sup> / <sub>8</sub>   | 12 <sup>13</sup> / <sub>16</sub> |
| b         | 19 <sup>13</sup> / <sub>16</sub> | 19 <sup>9</sup> / <sub>16</sub>  |
| c         | 23 <sup>13</sup> / <sub>16</sub> | 23 <sup>13</sup> / <sub>16</sub> |
| d         | 14 <sup>3</sup> / <sub>8</sub>   | 14 <sup>3</sup> / <sub>8</sub>   |
| e         | 6 <sup>3</sup> / <sub>4</sub>    | 6 <sup>3</sup> / <sub>4</sub>    |
| f         | 7 <sup>11</sup> / <sub>16</sub>  | 7 <sup>11</sup> / <sub>16</sub>  |
| g         | 5 <sup>3</sup> / <sub>8</sub>    | 5 <sup>3</sup> / <sub>8</sub>    |
| h         | 2                                | 2                                |
| j         | 2                                | 2                                |
| k         | 7 <sup>3</sup> / <sub>8</sub>    | 9 <sup>1</sup> / <sub>4</sub>    |
| l         | 2 <sup>1</sup> / <sub>16</sub>   | 2 <sup>1</sup> / <sub>16</sub>   |
| m         | 9 <sup>3</sup> / <sub>8</sub>    | 9 <sup>3</sup> / <sub>8</sub>    |
| n         | 5 <sup>1</sup> / <sub>4</sub>    | 5 <sup>1</sup> / <sub>4</sub>    |
| p         | 1 <sup>1</sup> / <sub>4</sub>    | 2                                |

\*Dimensions are approximate, not for construction purposes.

# 3C

## EPC Series Circuit Breakers and Enclosures

100/150A Frame, Thermal Magnetic,  
120–240 VAC, 125–250 VDC

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### Ordering Information:

To order an enclosure complete with circuit breaker where there is a choice of manufacturer, insert the manufacturer's symbol in the designated position of the catalog number.

Enclosures only can be ordered. Select from listings.

### Non-Interchangeable Trip

| Circuit Breaker |                   | Enclosure                  |             | Circuit Bkr.<br>Amp<br>Rating | Without Circuit<br>Bkr. Cat. # | With Circuit<br>Bkr. Cat. # |
|-----------------|-------------------|----------------------------|-------------|-------------------------------|--------------------------------|-----------------------------|
| Poles           | Voltage<br>Rating | Int.<br>Dia.               | Hub<br>Size |                               |                                |                             |
| 3C              | 2                 | 240VAC<br>or<br>125-250VDC | 7           | 1¼                            | EPC377                         | EPC377 ①15EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①20EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①30EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①40EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①50EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①70EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①90EB 2              |
|                 |                   |                            |             |                               |                                | EPC377 ①100EB 2             |
|                 |                   |                            | 7W          | 2                             | EPC387                         | EPC387 ① 70EB 2             |
|                 |                   |                            |             |                               |                                | EPC387 ① 90EB 2             |
|                 |                   |                            |             |                               |                                | EPC387 ① 100EB 2            |
|                 |                   |                            |             |                               |                                |                             |
| 3               | 240VAC*           |                            | 7           | 1¼                            | EPC377                         | EPC377 ①15EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①20EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①30EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①40EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①50EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①70EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①99EB 3              |
|                 |                   |                            |             |                               |                                | EPC377 ①100EB 3             |
|                 |                   |                            | 7W          | 2                             | EPC387                         | EPC387 ① 70EB 3             |
|                 |                   |                            |             |                               |                                | EPC387 ① 90EB 3             |
|                 |                   |                            |             |                               |                                | EPC387 ① 100EB 3            |
|                 |                   |                            |             |                               |                                |                             |

\*Square D 240VAC/125–250VDC

① Circuit Breakers

| Manufacturer     | Frame | Symbol |
|------------------|-------|--------|
| General Electric | TEB   | TT     |
| Cutler-Hammer    | ED    | WT     |

# EPC Series Circuit Breakers and Enclosures

100/150A Frame, Thermal Magnetic, 480–600 VAC, 250 VDC

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

3C

## Non-Interchangeable Trip

| Circuit Breaker |                  | Enclosure |          | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cat. # |
|-----------------|------------------|-----------|----------|-------------------------|-----------------------------|--------------------------|
| Poles           | Voltage Rating   | Int. Dia. | Hub Size |                         |                             |                          |
| 2               | 480VAC or 250VDC | 7         | 1¼       | 15                      | EPC377                      | EPC377 ①15EHD 2          |
|                 |                  |           |          | 20                      |                             | EPC377 ①20EHD 2          |
|                 |                  |           |          | 30                      |                             | EPC377 ①30EHD 2          |
|                 |                  |           |          | 40                      |                             | EPC377 ①40EHD 2          |
|                 |                  |           |          | 50                      |                             | EPC377 ①50EHD 2          |
|                 |                  |           |          | 70                      |                             | EPC377 ①70EHD 2          |
|                 |                  | 7W        | 2        | 90                      | EPC387                      | EPC377 ①90EHD 2          |
|                 |                  |           |          | 100                     |                             | EPC377 ①100EHD 2         |
|                 |                  |           |          | 70                      |                             | EPC387 ①70EHD 2          |
|                 |                  |           |          | 90                      |                             | EPC387 ①90EHD 2          |
|                 |                  |           |          | 100                     |                             | EPC387 ①100EHD 2         |
| 3               | 480VAC           | 7         | 1¼       | 15                      | EPC377                      | EPC377 ①15EHD 3          |
|                 |                  |           |          | 20                      |                             | EPC377 ①20EHD 3          |
|                 |                  |           |          | 30                      |                             | EPC377 ①30EHD 3          |
|                 |                  |           |          | 40                      |                             | EPC377 ①40EHD 3          |
|                 |                  |           |          | 50                      |                             | EPC377 ①50EHD 3          |
|                 |                  |           |          | 70                      |                             | EPC377 ①70EHD 3          |
|                 |                  | 7W        | 2        | 90                      | EPC387                      | EPC377 ①90EHD 3          |
|                 |                  |           |          | 100                     |                             | EPC377 ①100EHD 3         |
|                 |                  |           |          | 70                      |                             | EPC387 ①70EHD 3          |
|                 |                  |           |          | 90                      |                             | EPC387 ①90EHD 3          |
|                 |                  |           |          | 100                     |                             | EPC387 ①100EHD 3         |
| 2               | 600VAC or 250VDC | 7         | 1¼       | 15                      | EPC377                      | EPC377 ②15FDB 2          |
|                 |                  |           |          | 20                      |                             | EPC377 ②20FDB 2          |
|                 |                  |           |          | 30                      |                             | EPC377 ②30FDB 2          |
|                 |                  |           |          | 40                      |                             | EPC377 ②40FDB 2          |
|                 |                  |           |          | 50                      |                             | EPC377 ②50FDB 2          |
|                 |                  |           |          | 70                      |                             | EPC377 ②70FDB 2          |
|                 |                  | 7W        | 2        | 90                      | EPC387                      | EPC377 ②90FDB 2          |
|                 |                  |           |          | 100                     |                             | EPC377 ②100FDB 2         |
|                 |                  |           |          | 70                      |                             | EPC387 ②70FDB 2          |
|                 |                  |           |          | 90                      |                             | EPC387 ②90FDB 2          |
|                 |                  |           |          | 100                     |                             | EPC387 ②100FDB 2         |
|                 |                  |           |          | 110                     |                             | EPC387 ②110FDB 2         |
| 3               | 600VAC           | 7         | 1¼       | 125                     | EPC387                      | EPC387 ②125FDB 2         |
|                 |                  |           |          | 150                     |                             | EPC387 ②150FDB 2         |
|                 |                  | 7W        | 2        | 70                      | EPC377                      | EPC377 ②15FDB 3          |
|                 |                  |           |          | 90                      |                             | EPC377 ②20FDB 3          |
|                 |                  |           |          | 100                     |                             | EPC377 ②30FDB 3          |
|                 |                  |           |          | 110                     |                             | EPC377 ②40FDB 3          |
|                 |                  |           |          | 125                     |                             | EPC377 ②50FDB 3          |
|                 |                  |           |          | 150                     |                             | EPC377 ②70FDB 3          |
|                 |                  | 7W        | 2        | 70                      | EPC387                      | EPC377 ②90FDB 3          |
|                 |                  |           |          | 90                      |                             | EPC377 ②100FDB 3         |
|                 |                  |           |          | 100                     |                             | EPC387 ②70FDB 3          |
|                 |                  |           |          | 110                     |                             | EPC387 ②90FDB 3          |
|                 |                  |           |          | 125                     |                             | EPC387 ②100FDB 3         |
|                 |                  |           |          | 150                     |                             | EPC387 ②110FDB 3         |

① Circuit Breakers

| Manufacturer     | Frame | Symbol |
|------------------|-------|--------|
| General Electric | TED   | TT     |
| Cutler-Hammer    | EHD   | WT     |

② Circuit Breakers

| Manufacturer     | Frame   | Symbol |
|------------------|---------|--------|
| General Electric | TED     | TT     |
| Cutler-Hammer    | FD, FDB | WT     |

Crouse-Hinds

by E.T.N

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

501

3C

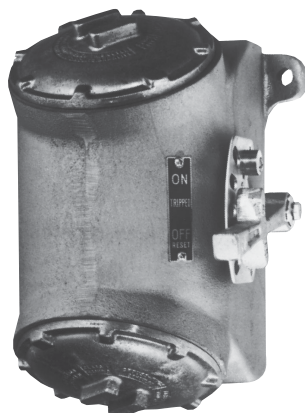
Cl. I, Div. 1 & 2, Groups C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 4, 7CD, 9EFG

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

## Applications:

FLB circuit breakers and enclosures are used:

- For service entrance, feeder or branch circuit protection for lighting, heating, appliance and motor circuits
- In areas made hazardous due to the presence of flammable vapors, gases or combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnect means, short circuit protection and thermal time delay overload protection



## Features:

- Semi-cylindrical body shape for maximum strength at lowest practical weight
- Round threaded covers at each end, set at an angle to provide ready access to interior for ease of wiring
- Breaker is operated by an external handle which can be padlocked in either "ON" or "OFF" positions. Breaker is trip-free of the handle and will open under short circuit or overload even if the handle is locked in the "ON" position
- Bodies have vertical through feed conduit hubs of sizes given in the listings

## Certifications and Compliances:

- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 4, 7CD, 9EFG
- UL Standard: 698
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Bodies, covers and operating handles – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

## Standard Finishes:

- Copper-free aluminum – natural
- Stainless steel – natural
- Sheet steel – zinc electroplate with chromate finish

## Electrical Rating Ranges:

- 100 and 225 ampere frame sizes

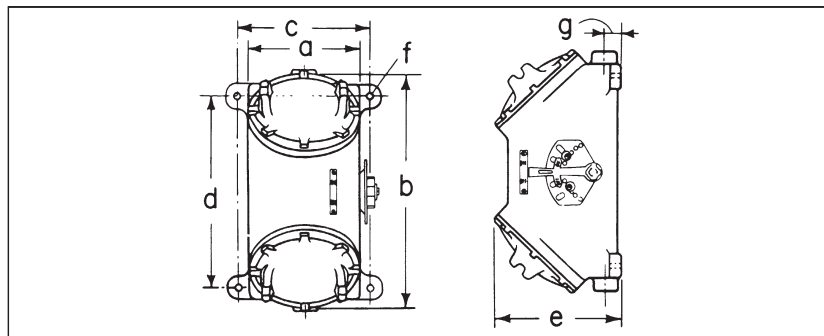
## Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                             | Suffix |
|-----------------------------------------------------------------------------------------|--------|
| 2 lugs for neutral connections (50, 100 and 225 amp.)                                   | S146   |
| Ground neutral stud with 3 connectors (50, 100 and 225 amp.)                            | S168   |
| Standard Breather (Class I, Groups C, D; Class II, Groups E, F, G; Class III)           | S219   |
| Standard Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III)              | S198   |
| Standard Breather and Drain (Class I, Groups C, D; Class II, Groups E, F, G; Class III) | S198V  |
| Universal Breather – Drain (Class I, Groups C, D; Class II, Groups F, G)                | S454*  |
| (2) Universal Breather – Drains (Class I, Groups C, D; Class II, Groups F, G)           | S454V* |
| Specify Auxiliary Switch†                                                               |        |
| 1A/1B (1P2T)                                                                            | S784   |
| 2A/2B (2P2T)                                                                            | S785   |

## Dimensions

In Inches§:



| Cat. #                                                                                 | a      | b      | c      | d     | e      | f     | g      |
|----------------------------------------------------------------------------------------|--------|--------|--------|-------|--------|-------|--------|
| †FLB140, 220, 221                                                                      | 5 1/4  | 10 1/4 | 6 1/4  | 7 1/4 | 7      | 7/16  | 1 1/8  |
| FLB115, 141, 147, 148, 171, 172, 173, 175, 222, 361, 116, 142, 149, 174, 177, 223, 362 | 7 1/2  | 13 3/8 | 8 1/2  | 9 3/4 | 9 1/8  | 7/16  | 1 3/4  |
| FLB224, 225, 264, 265, 267, 346                                                        | 13 3/4 | 22 1/2 | 16 1/4 | 9 7/8 | 15 1/2 | 21/32 | 2 7/16 |

\*Not suitable for NEMA 4/EEMAC.

†With two mounting feet, one at upper right and one at lower left.

‡Application is limited by circuit breaker design – Consult Factory.

§Dimensions are approximate, not for construction purposes.

# FLB Series Circuit Breakers and Enclosures

**100A Frame, Thermal Magnetic,  
120 VAC/125 VDC, 240 VAC/250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**3C**

## Ordering Information:

To order an enclosure complete with circuit breaker where there is a choice of manufacturer, insert the manufacturer's symbol in the designated position of the catalog number.

Enclosures only can be ordered. Select from listings.

## 100 Ampere Frame Size with Non-Interchangeable Trip 240VAC Max.

| Circuit Breaker |                            | Enclosure      |                         |                             |                                                 |
|-----------------|----------------------------|----------------|-------------------------|-----------------------------|-------------------------------------------------|
| Poles           | Voltage Rating             | Hub Size       | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. General Electric "TEB" Cat. # |
| 1               | 120VAC<br>or<br>125VDC     | $\frac{3}{4}$  | 15                      | FLB220                      | FLB220 TT15 1                                   |
|                 |                            |                | 20                      |                             | FLB220 TT20 1                                   |
|                 |                            |                | 30                      |                             | FLB220 TT30 1                                   |
|                 |                            |                | 40                      |                             | FLB220 TT40 1                                   |
|                 |                            |                | 50                      |                             | FLB220 TT50 1                                   |
| 2               | 240VAC<br>or<br>125–250VDC | 1              | 15                      | FLB221                      | FLB221 TT15 2                                   |
|                 |                            |                | 20                      |                             | FLB221 TT20 2                                   |
|                 |                            |                | 30                      |                             | FLB221 TT30 2                                   |
|                 |                            |                | 40                      |                             | FLB221 TT40 2                                   |
|                 |                            |                | 50                      |                             | FLB221 TT50 2                                   |
|                 |                            | $1\frac{1}{2}$ | 70                      | FLB223                      | FLB223 TT70 2                                   |
|                 |                            |                | 90                      |                             | FLB223 TT90 2                                   |
|                 |                            |                | 100                     |                             | FLB223 TT100 2                                  |
|                 |                            | $1\frac{1}{4}$ | 15                      | FLB222                      | FLB222 TT15 3                                   |
|                 |                            |                | 20                      |                             | FLB222 TT20 3                                   |
|                 |                            |                | 30                      |                             | FLB222 TT30 3                                   |
|                 |                            |                | 40                      |                             | FLB222 TT40 3                                   |
|                 |                            |                | 50                      |                             | FLB222 TT50 3                                   |
| 3               | 240VAC                     | $1\frac{1}{2}$ | 70                      | FLB223                      | FLB223 TT70 3                                   |
|                 |                            |                | 90                      |                             | FLB223 TT90 3                                   |
|                 |                            |                | 100                     |                             | FLB223 TT100 3                                  |

3C

# 3C

## FLB Series Circuit Breakers and Enclosures

**100A Frame, Thermal Magnetic,  
120–480 VAC, 125–250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### 100 Ampere Frame Size with Non-Interchangeable Trip 480VAC Max.

| Circuit Breaker |                  | Enclosure |                         |                             |                                              |                                                    |
|-----------------|------------------|-----------|-------------------------|-----------------------------|----------------------------------------------|----------------------------------------------------|
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "EHD" Cat. # | With Circuit Breaker General Electric "TED" Cat. # |
| 2               | 480VAC or 250VDC | 1         | 15                      | FLB140                      | FLB140 WT15 2                                | FLB140 TT15 2                                      |
|                 |                  |           | 20                      |                             | FLB140 WT20 2                                | FLB140 TT20 2                                      |
|                 |                  |           | 30                      |                             | FLB140 WT30 2                                | FLB140 TT30 2                                      |
|                 |                  |           | 40                      |                             | FLB140 WT40 2                                | FLB140 TT40 2                                      |
|                 |                  |           | 50                      |                             | FLB140 WT50 2                                | FLB140 TT50 2                                      |
|                 |                  | 1½        | 70                      | FLB142                      | FLB142 WT70 2                                | FLB142 TT70 2                                      |
|                 |                  |           | 90                      |                             | FLB142 WT90 2                                | FLB142 TT90 2                                      |
|                 |                  |           | 100                     |                             | FLB142 WT100 2                               | FLB142 TT100 2                                     |
|                 |                  | 1¼        | 15                      | FLB141                      | FLB141 WT15 3                                | FLB141 TT15 3                                      |
|                 |                  |           | 20                      |                             | FLB141 WT20 3                                | FLB141 TT20 3                                      |
|                 |                  |           | 30                      |                             | FLB141 WT30 3                                | FLB141 TT30 3                                      |
|                 |                  |           | 40                      |                             | FLB141 WT40 3                                | FLB141 TT40 3                                      |
|                 |                  |           | 50                      |                             | FLB141 WT50 3                                | FLB141 TT50 3                                      |
| 3               | 480VAC           | 1½        | 70                      | FLB142                      | FLB142 WT70 3                                | FLB142 TT70 3                                      |
|                 |                  |           | 90                      |                             | FLB142 WT90 3                                | FLB142 TT90 3                                      |
|                 |                  |           | 100                     |                             | FLB142 WT100 3                               | FLB142 TT100 3                                     |



# FLB Series Circuit Breakers and Enclosures

**100A Frame, Thermal Magnetic, 600 VAC, 250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**3C**

## 100 Ampere Frame Size with Non-Interchangeable Trip 600VAC Max.

| Circuit Breaker |                  | Enclosure |                         |                             |                                                 |
|-----------------|------------------|-----------|-------------------------|-----------------------------|-------------------------------------------------|
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "FDB" Cat. #    |
| 2               | 600VAC or 250VDC | 1¼        | 15                      | FLB115                      | FLB115 WT15 2                                   |
|                 |                  |           | 20                      |                             | FLB115 WT20 2                                   |
|                 |                  |           | 30                      |                             | FLB115 WT30 2                                   |
|                 |                  |           | 40                      |                             | FLB115 WT40 2                                   |
|                 |                  |           | 50                      |                             | FLB115 WT50 2                                   |
|                 |                  | 1½        | 70                      | FLB116                      | FLB116 WT70 2                                   |
|                 |                  |           | 90                      |                             | FLB116 WT90 2                                   |
|                 |                  |           | 100                     |                             | FLB116 WT100 2                                  |
| 3               | 600VAC           | 1¼        | 15                      | FLB115                      | FLB115 WT15 3                                   |
|                 |                  |           | 20                      |                             | FLB115 WT20 3                                   |
|                 |                  |           | 30                      |                             | FLB115 WT30 3                                   |
|                 |                  |           | 40                      |                             | FLB115 WT40 3                                   |
|                 |                  |           | 50                      |                             | FLB115 WT50 3                                   |
|                 |                  | 1½        | 70                      | FLB116                      | FLB116 WT70 3                                   |
|                 |                  |           | 90                      |                             | FLB116 WT90 3                                   |
|                 |                  |           | 100                     |                             | FLB116 WT100 3                                  |
| Circuit Breaker |                  | Enclosure |                         |                             |                                                 |
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. General Electric "TED" Cat. # |
| 3               | 600VAC           | 1¼        | 15                      | FLB361                      | FLB361 TT15 3                                   |
|                 |                  |           | 20                      |                             | FLB361 TT20 3                                   |
|                 |                  |           | 30                      |                             | FLB361 TT30 3                                   |
|                 |                  |           | 40                      |                             | FLB361 TT40 3                                   |
|                 |                  |           | 50                      |                             | FLB361 TT50 3                                   |
|                 |                  | 1½        | 70                      | FLB362                      | FLB362 TT70 3                                   |
|                 |                  |           | 90                      |                             | FLB362 TT90 3                                   |
|                 |                  |           | 100                     |                             | FLB362 TT100 3                                  |

3C

# 3C

## FLB Series Circuit Breakers and Enclosures

**225A Frame, Thermal Magnetic,  
600 VAC, 250 VDC**

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### 100 Ampere Frame Size with Non-Interchangeable Trip 600VAC Max.

| Circuit Breaker |                  | Enclosure |                         |                             |                                                 |
|-----------------|------------------|-----------|-------------------------|-----------------------------|-------------------------------------------------|
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "JDB"† Cat. #   |
| 2               | 600VAC or 250VDC | 2½        | 125                     | FLB264                      | FLB264 WT125 2                                  |
|                 |                  |           | 150                     |                             | FLB264 WT150 2                                  |
|                 |                  |           | 175                     |                             | FLB264 WT175 2                                  |
|                 |                  |           | 200                     |                             | FLB264 WT200 2                                  |
|                 |                  |           | 225                     |                             | FLB264 WT225 2                                  |
| 3               | 600VAC           | 2½        | 125                     | FLB264                      | FLB264 WT125 3                                  |
|                 |                  |           | 150                     |                             | FLB264 WT150 3                                  |
|                 |                  |           | 175                     |                             | FLB264 WT175 3                                  |
|                 |                  |           | 200                     |                             | FLB264 WT200 3                                  |
|                 |                  |           | 225                     |                             | FLB264 WT225 3                                  |
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. General Electric "TFJ" Cat. # |
| 3               | 600VAC           | 2½        | 125                     | FLB224 or FLB346            | FLB224 TT125 3                                  |
|                 |                  |           | 150                     |                             | FLB224 TT150 3                                  |
|                 |                  |           | 175                     |                             | FLB224 TT175 3                                  |
|                 |                  |           | 200                     |                             | FLB224 TT200 3                                  |
|                 |                  |           | 225                     |                             | FLB224 TT225 3                                  |

### 100 Ampere Frame Size with Interchangeable Trip 600VAC Max.

| Circuit Breaker |                  | Enclosure |                         |                             |                                              |                                                 |
|-----------------|------------------|-----------|-------------------------|-----------------------------|----------------------------------------------|-------------------------------------------------|
| Poles           | Voltage Rating   | Hub Size  | Circuit Bkr. Amp Rating | Without Circuit Bkr. Cat. # | With Circuit Bkr. Cutler-Hammer "JD"* Cat. # | With Circuit Bkr. General Electric "TFK" Cat. # |
| 2               | 600VAC or 250VDC | 3         | 125                     | FLB267                      | FLB267 WT125 2                               |                                                 |
|                 |                  |           | 150                     |                             | FLB267 WT150 2                               |                                                 |
|                 |                  |           | 175                     |                             | FLB267 WT175 2                               |                                                 |
|                 |                  |           | 200                     |                             | FLB267 WT200 2                               |                                                 |
|                 |                  |           | 225                     |                             | FLB267 WT225 2                               |                                                 |
| 3               | 600VAC           | 3         | 125                     | FLB267 or FLB225            | FLB267 WT125 3                               | FLB225 TT125 3                                  |
|                 |                  |           | 150                     |                             | FLB267 WT150 3                               | FLB225 TT150 3                                  |
|                 |                  |           | 175                     |                             | FLB267 WT175 3                               | FLB225 TT175 3                                  |
|                 |                  |           | 200                     |                             | FLB267 WT200 3                               | FLB225 TT200 3                                  |
|                 |                  |           | 225                     |                             | FLB267 WT225 3                               | FLB225 TT225 3                                  |

\*Formerly "KB"  
†Formerly "JB"

# EFD and EFDC Series Circuit Breakers and Enclosures

120VAC, Single Pole

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

3C

## Applications:

EFD circuit breakers and enclosures are used:

- For branch circuit protection for lighting, appliance, and motor circuits
- In areas made hazardous due to the presence of flammable vapors, gases or combustible dusts
- In corrosive locations
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To provide disconnect means, short circuit protection and thermal time delay overload protection

## Features:

- Small, compact enclosures with accurately ground, wide flange on both body and cover for flamtight joint
- Dead-end (EFD) or through feed (EFDC) hubs  $\frac{3}{4}$ " to 1" sizes
- Breaker mounted on cover and back wired for ease of installation
- Breaker can be padlocked in "ON" or "OFF" positions with trip-free handle mechanism

## Certifications and Compliances:

- NEC:
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA 3, 7B\*CD, 9EFG, 12

## Standard Materials:

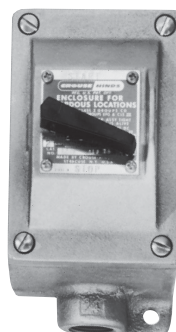
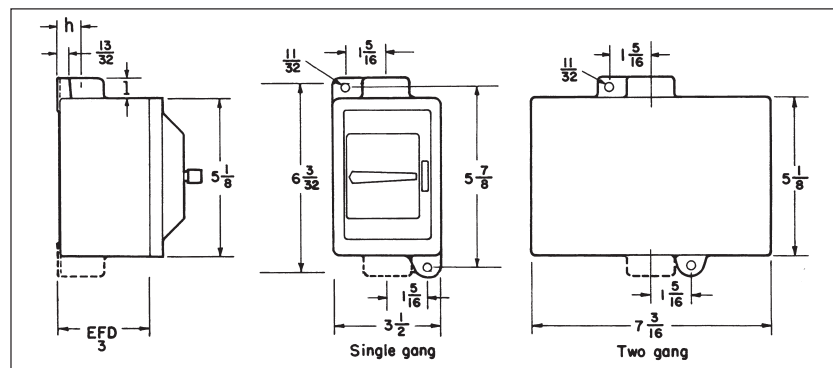
- Bodies and covers – *Feraloy*<sup>®</sup> iron alloy
- Operating handles – type 6 / 6 nylon
- Operating shafts – stainless steel

## Standard Finishes:

- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Type 6 / 6 nylon – black
- Stainless steel – natural

## Dimensions

In Inches†:



EFD dead end



EFDC through feed

## Electrical Ratings:

- Single pole – 120 / 240 VAC max.
- Trip ratings – 15, 20 and 30 amp.

## Options:

Description  
For use in Group B hazardous areas\*

Suffix  
GB

## Ordering Information

### With Square D Type "QOU" Circuit Breakers

| Hub Size in.                           | 15 Amp Cat. # | 20 Amp Cat. # | 30 Amp Cat. # |
|----------------------------------------|---------------|---------------|---------------|
| <b>EFD Single Gang (Dead End)</b>      |               |               |               |
| $\frac{3}{4}$                          | EFD21104      | EFD21105      | EFD21106      |
| 1                                      | EFD31104      | EFD31105      | EFD31106      |
| <b>EFDC Single Gang (Through Feed)</b> |               |               |               |
| $\frac{3}{4}$                          | EFDC21104     | EFDC21105     | EFDC21106     |
| 1                                      | EFDC31104     | EFDC31105     | EFDC31106     |
| <b>EFD Two Gang (Dead End)</b>         |               |               |               |
| $\frac{3}{4}$                          | EFD22104      | EFD22105      | EFD22106      |
| 1                                      | EFD32104      | EFD32105      | EFD32106      |
| <b>EFDC Two Gang (Through Feed)</b>    |               |               |               |
| $\frac{3}{4}$                          | EFDC22104     | EFDC22105     | EFDC22106     |
| 1                                      | EFDC32104     | EFDC32105     | EFDC32106     |

| Hub Size      | Dim. "h"      | Dim. "l"        |
|---------------|---------------|-----------------|
| $\frac{3}{4}$ | $\frac{7}{8}$ | $\frac{13}{16}$ |
| 1             | 1             | $\frac{15}{16}$ |

\*Seals must be installed within  $\frac{1}{2}$ " of each conduit opening, for Group B use.  
†Dimensions are approximate, not for construction purposes.

Crouse-Hinds

by E.T.N

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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# NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Applications:

- NCB circuit breakers are for use in conjunction with a variety of heating, lighting and power circuits to provide disconnect means and short circuit protection.

## Features:

- Enclosures are made of *Krydon*®, Eaton's Crouse-Hinds' high impact strength fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat
- Unitized, strong and durable enclosure construction provides longer service life for equipment
- Enclosure has hinged access door which opens 160° for easy wiring and maintenance. Three screws for door frame are hidden behind access door
- Access door may be padlocked to prevent unauthorized access

## Certifications and Compliances:

- NEMA: 3, 4X and 12
- CSA Standard: C22.2 No. 94
- UL Standard: 489

## Electrical Rating Ranges:

- 100, 150, 225, 250 and 400 amp frames

## Options:

### Description

- Insulated, groundable type terminal block for grounded or ungrounded neutral can be supplied
- Hubs (see "Note on Hubs") – see listing on page 677
- Grounding plate or bushing – see listing on page 677

### Suffix

S618



Circuit breaker enclosure with built-in *Krydon* material handle

## Ordering Information

To order an enclosure complete with circuit breaker, insert the manufacturer's symbol in the designated position of the catalog number.

Enclosures only can be ordered. Select from listings.

| Circuit Breaker                              |                     |      | Enclosure                   |                                |
|----------------------------------------------|---------------------|------|-----------------------------|--------------------------------|
| Poles                                        | Voltage Rating      | Amps | With Circuit Breaker Cat. # | Without Circuit Breaker Cat. # |
| <b>100A Frame (Non-Interchangeable Trip)</b> |                     |      |                             |                                |
| 2                                            | 240 VAC/<br>250 VDC | 15   | NCB1018F ①15EB 22           | NCB1018F                       |
|                                              |                     | 20   | NCB1018F ①20EB 22           |                                |
|                                              |                     | 25   | NCB1018F ①25EB 22           |                                |
|                                              |                     | 30   | NCB1018F ①30EB 22           |                                |
|                                              |                     | 35   | NCB1018F ①35EB 22           |                                |
|                                              |                     | 40   | NCB1018F ①40EB 22           |                                |
|                                              |                     | 50   | NCB1018F ①50EB 22           |                                |
|                                              |                     | 60   | NCB1018F ①60EB 22           |                                |
|                                              |                     | 70   | NCB1018F ①70EB 22           |                                |
|                                              |                     | 80   | NCB1018F ①80EB 22           |                                |
|                                              |                     | 90   | NCB1018F ①90EB 22           |                                |
|                                              |                     | 100  | NCB1018F ①100EB 22          |                                |
| 2                                            | 480 VAC/<br>250 VDC | 15   | NCB1018F ①15EHB 24          | NCB1018F                       |
|                                              |                     | 20   | NCB1018F ①20EHB 24          |                                |
|                                              |                     | 25   | NCB1018F ①25EHB 24          |                                |
|                                              |                     | 30   | NCB1018F ①30EHB 24          |                                |
|                                              |                     | 35   | NCB1018F ①35EHB 24          |                                |
|                                              |                     | 40   | NCB1018F ①40EHB 24          |                                |
|                                              |                     | 50   | NCB1018F ①50EHB 24          |                                |
|                                              |                     | 60   | NCB1018F ①60EHB 24          |                                |
|                                              |                     | 70   | NCB1018F ①70EHB 24          |                                |
|                                              |                     | 80   | NCB1018F ①80EHB 24          |                                |
|                                              |                     | 90   | NCB1018F ①90EHB 24          |                                |
|                                              |                     | 100  | NCB1018F ①100EHB 24         |                                |

①Circuit Breakers:

### Frames

| Manufacturer     | Symbol | 100/ 150A |      |      |  | 225/<br>250A |  | 400A |  |
|------------------|--------|-----------|------|------|--|--------------|--|------|--|
|                  |        | 240V      | 480V | 600V |  | 600V         |  | 600V |  |
| General Electric | TT     | TEB       | TED† | TED† |  | TFJ          |  |      |  |
| Square D         | DT     | FAL†      | FAL† | FAL† |  | KAL          |  | LAL  |  |
| Cutler-Hammer    |        |           |      |      |  |              |  |      |  |
|                  | WT     | EB        | EHB, | FB,  |  | JB,          |  |      |  |
|                  |        |           | EHD  | FDB  |  | JDB          |  |      |  |

†Specify voltage.

**NOTE ON HUBS:** The following number and sizes of hubs (not mounted) are included when circuit breakers are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options")

| Circuit Breaker Frame | Ampere Rating | Number Included | Hub Size |
|-----------------------|---------------|-----------------|----------|
| EB, EHD*, FDB‡        | 15-50         | 2               | 1¼       |
| EB, EHD*, FDB‡        | 60-100        | 2               | 2        |
| JDB■                  | 110-225       | 2               | 2½       |
| KDB§                  | 250-400       | 2               | 3        |

\*Formerly EHB.  
‡Formerly FB.  
§Formerly LB.  
■Formerly JB.

**Crouse-Hinds**  
by **E.T.N.**

# NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

3C

| Circuit Breaker                                       |                     |      | Enclosure                   |                                |  |
|-------------------------------------------------------|---------------------|------|-----------------------------|--------------------------------|--|
| Poles                                                 | Voltage Rating      | Amps | With Circuit Breaker Cat. # | Without Circuit Breaker Cat. # |  |
| 100/150A Frame (Non-Interchangeable Trip) – continued |                     |      |                             |                                |  |
| 2†                                                    | 600 VAC/<br>250 VDC | 15   | NCB1018F ①15FB 26           | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20FB 26           |                                |  |
|                                                       |                     | 25   | NCB1018F ①25FB 26           |                                |  |
|                                                       |                     | 30   | NCB1018F ①30FB 26           |                                |  |
|                                                       |                     | 35   | NCB1018F ①35FB 26           |                                |  |
|                                                       |                     | 40   | NCB1018F ①40FB 26           |                                |  |
|                                                       |                     | 50   | NCB1018F ①50FB 26           |                                |  |
|                                                       |                     | 70   | NCB1018F ①70FB 26           |                                |  |
|                                                       |                     | 80   | NCB1018F ①80FB 26           |                                |  |
|                                                       |                     | 90   | NCB1018F ①90FB 26           |                                |  |
|                                                       |                     | 100  | NCB1018F ①100FB 26          |                                |  |
| 3                                                     | 240 VDC             | 15   | NCB1018F ①15EB 32           | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20EB 32           |                                |  |
|                                                       |                     | 25   | NCB1018F ①25EB 32           |                                |  |
|                                                       |                     | 30   | NCB1018F ①30EB 32           |                                |  |
|                                                       |                     | 35   | NCB1018F ①35EB 32           |                                |  |
|                                                       |                     | 40   | NCB1018F ①40EB 32           |                                |  |
|                                                       |                     | 50   | NCB1018F ①50EB 32           |                                |  |
|                                                       |                     | 70   | NCB1018F ①70EB 32           |                                |  |
|                                                       |                     | 80   | NCB1018F ①80EB 32           |                                |  |
|                                                       |                     | 90   | NCB1018F ①90EB 32           |                                |  |
|                                                       |                     | 100  | NCB1018F ①100EB 32          |                                |  |
| 3                                                     | 480 VAC             | 15   | NCB1018F ①15EBH 34          | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20EBH 34          |                                |  |
|                                                       |                     | 25   | NCB1018F ①25EBH 34          |                                |  |
|                                                       |                     | 30   | NCB1018F ①30EBH 34          |                                |  |
|                                                       |                     | 35   | NCB1018F ①35EBH 34          |                                |  |
|                                                       |                     | 40   | NCB1018F ①40EBH 34          |                                |  |
|                                                       |                     | 50   | NCB1018F ①50EBH 34          |                                |  |
|                                                       |                     | 70   | NCB1018F ①70EBH 34          |                                |  |
|                                                       |                     | 80   | NCB1018F ①80EBH 34          |                                |  |
|                                                       |                     | 90   | NCB1018F ①90EBH 34          |                                |  |
|                                                       |                     | 100  | NCB1018F ①100EBH 34         |                                |  |
| 3                                                     | 600 VAC             | 15   | NCB1018F ①15FB 36           | NCB1018F                       |  |
|                                                       |                     | 20   | NCB1018F ①20FB 36           |                                |  |
|                                                       |                     | 25   | NCB1018F ①25FB 36           |                                |  |
|                                                       |                     | 30   | NCB1018F ①30FB 36           |                                |  |
|                                                       |                     | 35   | NCB1018F ①35FB 36           |                                |  |
|                                                       |                     | 40   | NCB1018F ①40FB 36           |                                |  |
|                                                       |                     | 50   | NCB1018F ①50FB 36           |                                |  |
|                                                       |                     | 70   | NCB1018F ①70FB 36           |                                |  |
|                                                       |                     | 80   | NCB1018F ①80FB 36           |                                |  |
|                                                       |                     | 90   | NCB1018F ①90FB 36           |                                |  |
|                                                       |                     | 100  | NCB1018F ①100FB 36          |                                |  |

| Circuit Breaker                           |                     |      | Enclosure                   |                                |  |  |
|-------------------------------------------|---------------------|------|-----------------------------|--------------------------------|--|--|
| Poles                                     | Voltage Rating      | Amps | With Circuit Breaker Cat. # | Without Circuit Breaker Cat. # |  |  |
| 225/50A Frame (Non-Interchangeable Trip)§ |                     |      |                             |                                |  |  |
| 2                                         | 600 VAC/<br>250 VDC | 110  | NCB1024F ①110JB 26          | NCB1024F                       |  |  |
|                                           |                     | 125  | NCB1024F ①125JB 26          |                                |  |  |
|                                           |                     | 150  | NCB1024F ①150JB 26          |                                |  |  |
|                                           |                     | 175  | NCB1024F ①175JB 26          |                                |  |  |
|                                           |                     | 200  | NCB1024F ①200JB 26          |                                |  |  |
|                                           |                     | 225  | NCB1024F ①225JB 26          |                                |  |  |
| 3                                         | 600 VDC             | 110  | NCB1024F ①110JB 36          | NCB1024F                       |  |  |
|                                           |                     | 125  | NCB1024F ①125JB 36          |                                |  |  |
|                                           |                     | 150  | NCB1024F ①150JB 36          |                                |  |  |
|                                           |                     | 175  | NCB1024F ①175JB 36          |                                |  |  |
|                                           |                     | 200  | NCB1024F ①200JB 36          |                                |  |  |
|                                           |                     | 225  | NCB1024F ①225JB 36          |                                |  |  |
| 400A Frame (Interchangeable Trip)*        |                     |      |                             |                                |  |  |
| 2                                         | 600 VAC/<br>250 VDC | 250  | NCB1426F ①250LB 26          | NCB1426F                       |  |  |
|                                           |                     | 300  | NCB1426F ①300LB 26          |                                |  |  |
|                                           |                     | 350  | NCB1426F ①350LB 26          |                                |  |  |
|                                           |                     | 400  | NCB1426F ①400LB 26          |                                |  |  |
| 3                                         | 600 VAC             | 250  | NCB1426F ①250LB 36          | NCB1426F                       |  |  |
|                                           |                     | 300  | NCB1426F ①300LB 36          |                                |  |  |
|                                           |                     | 350  | NCB1426F ①350LB 36          |                                |  |  |
|                                           |                     | 400  | NCB1426F ①400LB 36          |                                |  |  |

①Circuit Breakers:

| Manufacturer     | Symbol | Frames               |             |            |                      |              |
|------------------|--------|----------------------|-------------|------------|----------------------|--------------|
|                  |        | 100/<br>150A<br>240V | 480V        | 600V       | 225/<br>250A<br>600V | 400A<br>600V |
| General Electric | TT     | TEB                  | TED†        | TED†       | TFJ                  |              |
| Square D         | DT     | FAL†                 | FAL†        | FAL†       | KAL                  | LAL          |
| Cutler-Hammer    | WT     | EB                   | EBH,<br>EHD | FB,<br>FDB | JB,<br>JDB           |              |

Note on Hubs: The following number and sizes of hubs (not mounted) are included when circuit breakers are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Circuit Breaker Frame | Ampere Rating | Number Included | Hub Size |
|-----------------------|---------------|-----------------|----------|
| EB, EHD⊕, FDB▲        | 15–50         | 2               | 1¼       |
| EB, EHD⊕, FDB▲        | 60–100        | 2               | 2        |
| JDB■                  | 110–225       | 2               | 2½       |

■Formerly JB  
⊕Formerly EHB  
▲Formerly FB

①Circuit Breakers:

| Manufacturer     | Symbol | Frames               |             |            |                      |              |
|------------------|--------|----------------------|-------------|------------|----------------------|--------------|
|                  |        | 100/<br>150A<br>240V | 480V        | 600V       | 225/<br>250A<br>600V | 400A<br>600V |
| General Electric | TT     | TEB                  | TED†        | TED†       | TFJ                  |              |
| Square D         | DT     | FAL†                 | FAL†        | FAL†       | KAL                  | LAL          |
| Cutler-Hammer    | WT     | EB                   | EBH,<br>EHD | FB,<br>FDB | JB,<br>JDB           |              |

**Note on Hubs:** The following number and sizes of hubs (not mounted) are included when circuit breakers are ordered complete. If enclosures only are ordered, hubs must be ordered separately (see "Options").

| Circuit Breaker<br>Frame | Ampere<br>Rating | Number<br>Included | Hub<br>Size |
|--------------------------|------------------|--------------------|-------------|
| EB, EHD, FDB▲            | 15–50            | 2                  | 1¼          |
| EB, EHD, FDB▲            | 60–100           | 2                  | 2           |
| JDB■                     | 110–225          | 2                  | 2½          |

■Formerly JB  
●Formerly EHB  
▲Formerly FB

†Specify voltage.

‡2-pole, 600 VAC/250 VDC for Square D circuit breakers only.

\*For Square D circuit breakers only.

§Also available with interchangeable trip breakers. Specify on order.

Crouse-Hinds

by EATON

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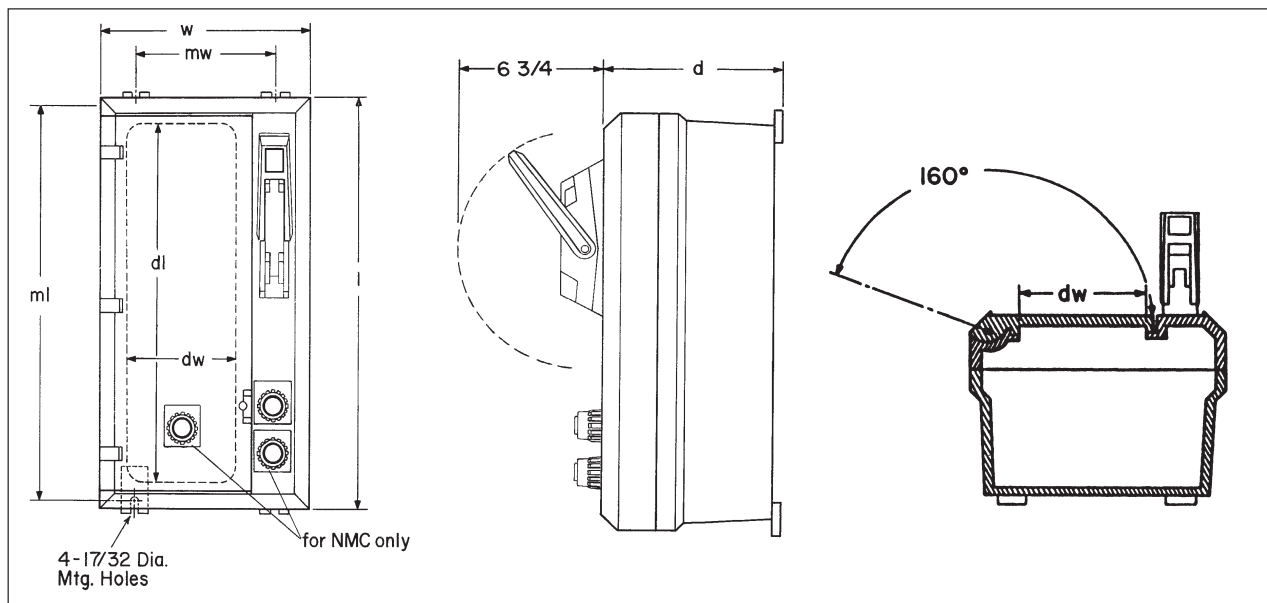
509

# 3C NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 12

## Dimensions In Inches\*



| Cat. #  | Outside Dimensions               |                                  | d                               | Mounting Dimensions            |                                | Door Opening Dimensions          |                                 |
|---------|----------------------------------|----------------------------------|---------------------------------|--------------------------------|--------------------------------|----------------------------------|---------------------------------|
|         | l                                | w                                |                                 | mw                             | ml                             | dl                               | dw                              |
| NCB1018 | 19 <sup>13</sup> / <sub>32</sub> | 11 <sup>13</sup> / <sub>32</sub> | 8 <sup>23</sup> / <sub>32</sub> | 7 <sup>7</sup> / <sub>8</sub>  | 19 <sup>9</sup> / <sub>8</sub> | 16 <sup>7</sup> / <sub>8</sub>   | 5 <sup>11</sup> / <sub>16</sub> |
| NCB1024 | 25 <sup>13</sup> / <sub>32</sub> | 11 <sup>13</sup> / <sub>32</sub> | 8 <sup>23</sup> / <sub>32</sub> | 7 <sup>7</sup> / <sub>8</sub>  | 25 <sup>9</sup> / <sub>8</sub> | 22 <sup>7</sup> / <sub>8</sub>   | 5 <sup>11</sup> / <sub>16</sub> |
| NCB1426 | 27 <sup>13</sup> / <sub>32</sub> | 15 <sup>13</sup> / <sub>32</sub> | 9 <sup>23</sup> / <sub>32</sub> | 11 <sup>7</sup> / <sub>8</sub> | 27 <sup>1</sup> / <sub>4</sub> | 23 <sup>11</sup> / <sub>16</sub> | 9 <sup>11</sup> / <sub>16</sub> |

\*Dimensions are approximate, not to be used for construction purposes.

| Description                                                             | Page No.          |
|-------------------------------------------------------------------------|-------------------|
| Application/Selection                                                   | see pages 512–513 |
| <b>EDS / EFS Series Control Stations</b>                                |                   |
| FlexStation™ Control Station Components                                 | see page 514      |
| EDSCM Modular Series Bodies                                             | see page 519      |
| DSD Cover and Device Sub-assemblies                                     | see page 521      |
| DSD-SR HP Rated Selector Switch                                         | see page 524      |
| <b>Fully Assembled EDS and EFS Control Stations</b>                     |                   |
| EDS Pushbutton Stations                                                 | see page 527      |
| EFS Pilot Light Stations                                                | see pages 530–531 |
| EDS Combination Pushbutton and Pilot Light Stations                     | see page 532      |
| EDS Selector Switches                                                   | see page 533      |
| EFS Selector Switches                                                   | see page 534      |
| EDS Snap Switches                                                       | see page 535      |
| EDS Manual Motor Starting Switches                                      | see pages 536–537 |
| EFS Fire Alarm Station                                                  | see page 538      |
| <b>EDS / EFS Control Stations Sub-assembly Reference Guide</b>          | see pages 539–540 |
| <b>MC / MCC Pushbutton, Selector Switch, and Pilot Light Stations</b>   | see page 541      |
| <b>N2S / N2SC Control Stations</b>                                      | see page 544      |
| <b>N2SU / N2SCU Control Stations</b>                                    | see page 551      |
| <b>N2FA / N2FAC Fire Alarm Control Stations</b>                         | see page 555      |
| <b>GHG43 Control Stations</b>                                           | see page 556      |
| <b>OAC Pushbutton Stations and Selector Switches</b>                    | see page 567      |
| <b>Control Station Covers</b>                                           | see page 570      |
| <b>Replacements for Pushbutton and Selector Switch Control Stations</b> | see page 571      |



### Application and Selection Quick Selector Chart

#### Applications:

Control stations are used as a remote means of:

- Motor control
- Visual indication of equipment performance
- On-off control of circuits
- Circuit selection

#### Considerations for Selection:

- The environment of the control station location and requirements for construction in terms of NEC/CEC compliances and NEMA/EEMAC type
- Function to be performed
- Desirability of factory sealing as compared to field sealing
- Factory sealing has distinct advantages:
  - Less installation problems
  - Less time consuming
  - Less change of error
  - Lower installed cost
  - Accommodates future changes to circuitry
  - Greater reliability
- The number of controls required, and the space available for installation. Where space is limited, panel or junction box mounting with many combinations are available
- See "Quick Selector Chart" for guidance

#### Options:

Many options are available on:

- Material and finishes where special atmospheric conditions prevail
- Special features for specific applications. See individual control station listings for available options

#### Quick Selector Chart

| Control Station                      | NEC/CEC – Hazardous Area Compliance                                                                                                     | NEMA/EEMAC Type               | Function                                     | Factory Sealed                                | No. of Devices or Units | Type of Mounting     | Cover Style  |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------|-----------------------------------------------|-------------------------|----------------------|--------------|
| MC, MCC                              |                                                                                                                                         | 3, 4                          | Pushbutton<br>Pilot light<br>Selector switch |                                               | 1-5*                    | Surface<br>1-5 gang  | Gasketed     |
| EDS, EDSC§                           | Cl. I, Div. 1, Groups C, D<br>Cl. I, Div. 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7B<br>(Div. 2) CD,<br>9EFG | Pilot light<br>Pushbutton<br>Selector switch | Pilot light<br>Pushbutton<br>Selector switch§ | 1-2*                    | Surface<br>1-2 gang  | Ground joint |
| DSD Covers and Device Sub-assemblies | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                           | 3, 7B,<br>9EFG                | Pilot light<br>Pushbutton<br>Selector switch | Pilot light<br>Pushbutton<br>Selector switch  | 1                       | Surface<br>1 gang    | Ground joint |
| DSD-SR                               | Cl. I, Div. 1 & 2, Groups C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                              | 3, 5, 7CD,<br>9EFG, 12        | Selector Switch                              |                                               | 1                       | Surface<br>1 gang    | Ground joint |
| EDSCM                                | Cl. I, Div. 1, Groups C, D<br>Cl. I, Div. 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III | 3, 7CD,<br>9EFG               | Pilot light<br>Pushbutton<br>Selector switch |                                               | 1-15*                   | Surface<br>1-15 gang | Ground joint |
| EF§§                                 | Cl. I, Div. 1 & 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                           | 3, 7BCD,<br>9EFG              | Pilot light<br>Pushbutton<br>Selector switch | Pilot light§<br>Pushbutton<br>Selector switch | 1-2*                    | Surface<br>1 gang    | Ground joint |

\*Number of devices per unit.

§Factory-sealed units.

## Application and Selection Quick Selector Chart

### Quick Selector Chart (continued)

| Control Station                | NEC/CEC – Hazardous Area Compliances                                                                                                                                                                                    | NEMA/EMAC Type                | Function                                                                                    | Factory Sealed                                              | No. of Devices or Units | Type of Mounting    | Cover Style      |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------|---------------------|------------------|
| FlexStation                    | Cl. I, Div. 1, Groups C, D<br>Cl. I, Div. 2, Groups B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                                                                                 | 3, 7B<br>(Div. 2) CD,<br>9EFG | Pilot light<br>Pushbutton                                                                   | Pilot light<br>Pushbutton                                   | 1-2-3                   | Surface<br>1-2 gang | Ground joint     |
| GHG43                          | Cl. I, Div. 2, Groups A, B, C, D<br>Cl. I, Zones 1 and 2, (A)Ex de IIB + H2, T6<br>Cl. II, Div. 1, Groups E, F, G<br>PTB ATEX Certified 3117<br>CENELEC EEx de IIC, T6, Zones 1 and 2<br>Eex de IIC, T6 Zones 21 and 22 | 4X, IP66                      | Pushbutton<br>Signal Lamp<br>Potentiometer<br>Ammeter<br>Selector Switch<br>Terminal Blocks |                                                             | 1-4*                    | Surface<br>1 gang   | Screw and Gasket |
| N2FA,<br>N2FAC                 | Cl. I, Div. 2, Groups B, C, D                                                                                                                                                                                           | 3, 7BCD, 12                   | Fire Alarm                                                                                  | Pushbutton<br>Selector switch                               | 1                       | Surface<br>1 gang   | Screw and Gasket |
| N2S,<br>N2SC<br>N2SU,<br>N2SCU | Cl. I, Div. 2, Groups B, C, D                                                                                                                                                                                           | 3, 4X, 7BCD, 12               | Pilot light<br>Pushbutton<br>Selector switch<br>Combination                                 | Pilot light<br>Pushbutton<br>Selector switch<br>Combination | 1-4*                    | Surface<br>1 gang   | Screw and Gasket |
| OAC                            | Cl. I, Div. 1, Groups A, B, C, D<br>Cl. I, Div. 2, Groups A, B, C, D<br>Cl. II, Div. 1, Groups E, F, G<br>Cl. II, Div. 2, Groups F, G<br>Cl. III                                                                        | 3, 7ABCD,<br>9EFG, 12         | Pushbutton<br>Selector switch                                                               | Pushbutton<br>Selector switch                               | 1-2*                    | Surface<br>1 gang   | Threaded         |

\*Number of devices per unit.

### Applications:

Five modular components – operators, contact blocks, covers, legend plates, and bodies – are combined to provide a variety of control stations which are:

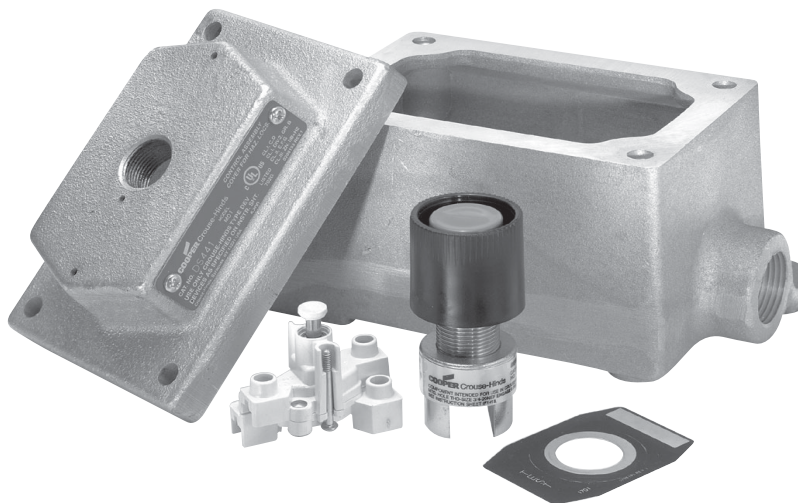
- For use indoors or outdoors, in areas which are hazardous due to the presence of flammable gases and vapors, or combustible dust.
- Used in conjunction with magnetic starters or contactors for remote control of motors and other electrical apparatus.
- For installation in petroleum refineries, chemical, petrochemical, and other industrial process facilities; grain processing and storage facilities; and other heavy industrial applications where Class I, Class II, or Class III hazards are present.

### Features:

- Momentary contact pushbuttons, maintained contact pushbuttons, and pilots lights offer a choice of functions.
- Selector switches in 2 or 3 position configurations including keyed and spring return options.
- Single-hole, two-hole, and three-hole covers for one, two, or three devices respectively per station.
- Rugged control devices for safe, reliable operation in industrial applications.
- Bodies, with extra room for wire pulling and termination, also include two integral mounting feet for fast, secure installation.
- Bodies have  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", or 1" dead-end or through-feed conduit hubs with integral bushing for protection of wire insulation.
- Covers and bodies are available in *Feraloy*® or copper-free aluminum for light weight and corrosion resistance.
- DL legend plates have large lettering to give clear indication of device function. Space is available for field markings.

### Certifications and Compliances:

- NEC  
Class I, Division 1 & 2, Groups B\* (Div. 2), C, D  
Class II, Division 1 & 2, Groups E, F, G  
Class III
- Zone 1 & 2 Group IIB\*
- NEMA: 3R, 7B (Div. 2) CD, 9EFG, 12
- UL Standard: 1203



### Standard Materials:

- Bodies, covers – *Feraloy*® or copper-free aluminum.
- Pushbuttons and guards – Type 6 / 6 nylon.
- Operating shafts, bearings – stainless steel.

### Standard Finishes:

- *Feraloy*® iron alloy – electrogalvanized and aluminum acrylic paint.
- Copper-free aluminum – natural.
- Stainless steel – natural.

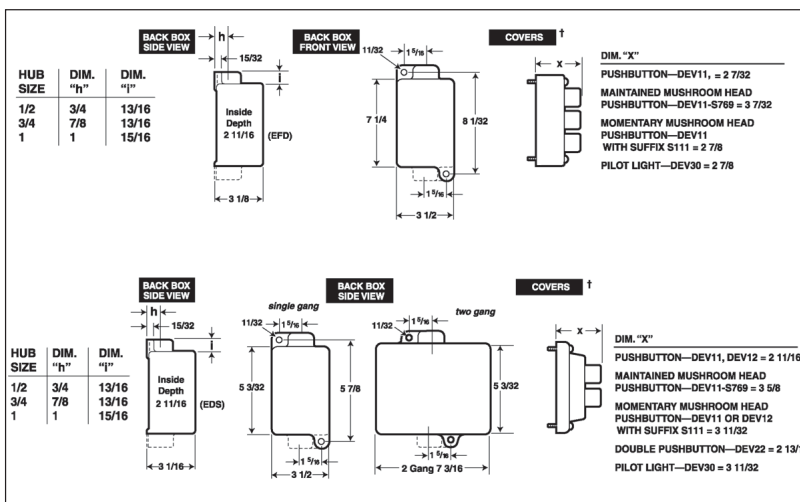
### Options:

| Description                                                          | Suffix |
|----------------------------------------------------------------------|--------|
| Copper-free aluminum bodies and covers                               | SA     |
| Corro-free™ epoxy finish for use in severely corrosive environments. | S752   |

### Electrical Ratings:

- Pushbuttons and selector switches – 600 VAC heavy duty (NEMA A600).
- Pilot lights – 120 VAC.

### Dimensions In Inches:



†Covers have same length and width as back boxes.

\*For Class I, Division 1, Group B or Zone 1 Hydrogen applications, use the EFS(C) complete control station catalog numbers see page 526.

# EDS / EFS Series Control Stations

## FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

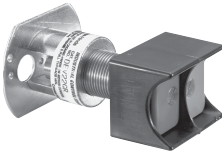
4C

### STEP 1 – Select Operator

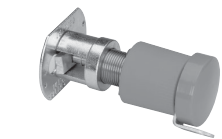
#### Pushbutton – front operated, standard black button



| Description                         | Cat. # |
|-------------------------------------|--------|
| Single button for 1 contact block   | DEV11  |
| Single button for 2 contact blocks  | DEV12  |
| Double buttons for 2 contact blocks | DEV22  |



| Options                                                                                                                      | Suffix |
|------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Specify color for each pushbutton button (ex: DEV11G, DEV22GR). Color is black if unspecified.</b>                        |        |
| Green button - unmarked                                                                                                      | G      |
| Red button - unmarked                                                                                                        | R      |
| Momentary red mushroom head style (not available with lockout or with DEV22)                                                 | S111   |
| Lockout with bar and chain (available on DEV11 and DEV12)                                                                    | S153   |
| Maintained red mushroom head style (lockout comes standard, do not specify S153; not available on DEV22) (Push to stop only) | S769   |



#### Pilot Light – factory sealed, incandescent lamp



| Description                               | Cat. #        |
|-------------------------------------------|---------------|
| Pilot light with red jewel                | DEV30 J1      |
| Pilot light with green jewel              | DEV30 J3      |
| Pilot light with amber jewel              | DEV30 J6      |
| Pilot light with clear jewel              | DEV30 J10     |
| Pilot light with blue LED and clear jewel | DEV30 J11 LED |

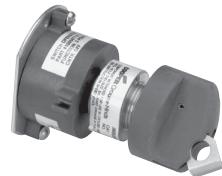


| Options                                            | Suffix |
|----------------------------------------------------|--------|
| LED lamps (standard clear jewel with colored lamp) | LED    |
| 24 V lamp (not available with transformer feature) | S300   |
| 240 / 120 V pilot light transformer                | T2     |
| 480 / 120 V pilot light transformer                | T4     |
| 600 / 120 V pilot light transformer                | T5     |

#### Selector Switch – with standard lockout



| Description                                                                                                                                                       | Cat. # |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 2-position (pos. 1 – N.O., pos. 2 – N.C.) for use with 1 or 2 contact blocks                                                                                      | DEV42  |
| 3-position (pos. 1 – N.O., pos. 2 – Open, pos. 3 – N.C.) for use with 1 or 2 contact blocks                                                                       | DEV43  |
| 3-position (pos. 1 – N.C., pos. 2 – N.O., pos. 3 – N.O. for Switch A)<br>(pos. 1 – N.O., pos. 2 – N.O., pos. 3 – N.C. for Switch B) for use with 2 contact blocks | DEV44  |



| Options                                                                                  | Suffix  |
|------------------------------------------------------------------------------------------|---------|
| Spring return to center from right (For DEV43 or DEV44 only)                             | S634    |
| Spring return to center from left (For DEV43 or DEV44 only)                              | S635    |
| Spring return to center from right and left (For DEV43 or DEV44 only)                    | S842    |
| Key Operated – removable from all positions                                              | S847 K1 |
| Key Operated – removable from left position for DEV42 or from center for DEV43 and DEV44 | S847 K2 |
| Key Operated – removable from right position for DEV42 or from left for DEV43 and DEV44  | S847 K3 |
| Key Operated – removable from right position for DEV43 and DEV44                         | S847 K4 |

### STEP 2 – Select Contact Block (if required). For product details see page 571.

#### Contact Block



| Description                                            | Cat. #  |
|--------------------------------------------------------|---------|
| Contact block, 1 NO and 1 NC, 10A, 600VAC, A600 rating | ESWP126 |

For additional technical information see page 571.

Note - Each control station will accept a maximum of three contact blocks. Select device operators accordingly. DEV12, DEV22 and DEV44 may not be used on a three-operator (DS443-SA) cover. DEV42 and DEV43 may not be used on a three-operator cover when using them with two contact blocks.

# 4C

## EDS / EFS Series Control Stations

### FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

#### STEP 3 – Select Desired Legend Plates

##### For use with single hole covers

| Cat. # | Inscription     |
|--------|-----------------|
| DL101  | Blank           |
| DL128  | Run-Jog         |
| DL129  | Hand-Auto       |
| DL130  | Forward-Reverse |
| DL132  | Open-Close      |
| DL133  | Up-Down         |
| DL135  | In-Out          |
| DL136  | Raise-Lower     |
| DL137  | Start-Stop      |
| DL138  | Run-Off-Jog     |
| DL139  | Hand-Off-Auto   |
| DL140  | For-Off-Rev     |
| DL141  | Fast-Off-Slow   |
| DL142  | 1-Off-2         |
| DL143  | Open-Off-Close  |
| DL144  | Up-Off-Down     |
| DL148  | Off-On          |
| DL149  | Auto-Off-Hand   |
| DL165  | Slow-Fast       |
| DL186  | Safe-Run        |
| DL187  | Raise-Off-Lower |
| DL188  | Slow-Off-Fast   |
| DL189  | Odd-Off-Even    |
| DL190  | Stop-Start      |
| DL191  | On-Off          |
| DL192  | Fast-Slow       |
| DL193  | Local-Remote    |
| DL194  | Trip-Reset      |
| DL195  | Auto-Manual     |
| DL196  | Start-Emer Stop |
| DL197  | Alarm-Silence   |
| DL198  | Maint-Manual    |
| DL199  | Test-Reset      |

##### For use with 2 or 3 hole covers

| Cat. # | Inscription          | Cat. # | Inscription     |
|--------|----------------------|--------|-----------------|
| DL01   | Blank w/no fields    | DL32   | Open-Close      |
| DL02   | Blank w/single field | DL33   | Up-Down         |
| DL03   | Blank w/2 fields     | DL35   | In-Out          |
| DL05   | Start                | DL36   | Raise-Lower     |
| DL06   | Stop                 | DL37   | Start-Stop      |
| DL07   | On                   | DL38   | Run-Off-Jog     |
| DL08   | Off                  | DL39   | Hand-Off-Auto   |
| DL09   | Run                  | DL40   | For-Off-Rev     |
| DL10   | Jog                  | DL41   | Fast-Off-Slow   |
| DL11   | Trip                 | DL42   | 1-Off-2         |
| DL12   | Reset                | DL43   | Open-Off-Close  |
| DL13   | Test                 | DL44   | Up-Off-Down     |
| DL14   | Power On             | DL46   | Fast            |
| DL15   | Hand                 | DL47   | Slow            |
| DL16   | Automatic            | DL48   | Off-On          |
| DL17   | Emer Stop            | DL49   | Auto-Off-Hand   |
| DL18   | Forward              | DL65   | Slow-Fast       |
| DL19   | Reverse              | DL85   | Safe            |
| DL20   | Open                 | DL86   | Safe-Run        |
| DL21   | Close                | DL87   | Raise-Off-Lower |
| DL22   | Up                   | DL88   | Slow-Off-Fast   |
| DL23   | Down                 | DL89   | Odd-Off-Even    |
| DL24   | In                   | DL90   | Stop-Start      |
| DL25   | Out                  | DL91   | On-Off          |
| DL26   | Raise                | DL92   | Fast-Slow       |
| DL27   | Lower                | DL93   | Local-Remote    |
| DL28   | Run-Jog              | DL94   | Trip-Reset      |
| DL29   | Hand-Auto            | DL95   | Auto-Manual     |
| DL30   | Forward-Reverse      | DL96   | Start-Emer Stop |
|        |                      | DL97   | Alarm-Silence   |
|        |                      | DL98   | Maint-Manual    |
|        |                      | DL99   | Test-Reset      |

**Note:** For special markings order DL101-"desired markings" or DL01-"desired markings"

#### STEP 4 – Select Cover Covers



| Description                                                                                       | Cat. #   |
|---------------------------------------------------------------------------------------------------|----------|
| Blank cover with single hole (Single gang)                                                        | DS441    |
| Blank cover with 2 holes (Single gang)                                                            | DS442    |
| Blank cover with 3 holes (To be used with EFD(C)1491-SA, 2491-SA or 3491-SA series of back boxes) | DS443 SA |
| Replacement cover plug for unused device operator openings                                        | 206765   |



| Options:                                                                                       | Suffix |
|------------------------------------------------------------------------------------------------|--------|
| Aluminum body (mandatory suffix on DS443 must be included in catalog number)                   | SA     |
| Exterior epoxy powder coat finish                                                              | S752   |
| Interior & exterior epoxy powder coat finish. Not available on three operator cover (DS443-SA) | S753   |

# EDS / EFS Series Control Stations

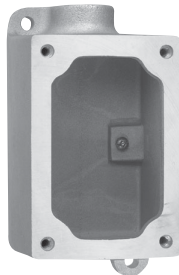
## FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

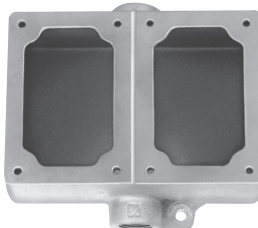
**4C**

### STEP 5 – Select Back Box

Back Boxes - for use with DS441 and DS442 covers or with 1 gang and 2 gang DS/DSD Series covers



| Dead End | Through Feed | Hub Size | Back Box Arrangement |
|----------|--------------|----------|----------------------|
| EDS171   | EDSC171      | 1/2"     | Single gang back box |
| EDS271   | EDSC271      | 3/4"     | Single gang back box |
| EDS371   | EDSC371      | 1"       | Single gang back box |
| EFS172   | EFSC172      | 1/2"     | Double gang back box |
| EFS272   | EFSC272      | 3/4"     | Double gang back box |
| EFS372   | EFSC372      | 1"       | Double gang back box |



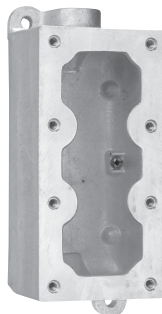
#### Options:

Aluminum body  
Exterior epoxy powder coat finish  
Interior & exterior epoxy powder coat finish

#### Suffix

SA  
S752  
S753

Back Boxes – for use with DS443-SA cover or with 1½ gang DS511 (3-operator) Series covers



| Dead End   | Through Feed | Hub Size | Back Box Arrangement |
|------------|--------------|----------|----------------------|
| EFD1491 SA | EFDC1491 SA  | 1/2"     | 1½ gang back box     |
| EFD2491 SA | EFDC2491 SA  | 3/4"     | 1½ gang back box     |
| EFD3491 SA | EFDC3491 SA  | 1"       | 1½ gang back box     |

#### Options

Exterior epoxy powder coat finish  
Interior & exterior epoxy powder coat finish

#### Suffix

S752  
S753

4C

## EDS / EFS Series Control Stations

### FlexStation™ Control Station Components

Cl. I, Div. 1 & 2, Groups B (Div. 2 only) C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
Zone 1 & 2 Group IIB  
NEMA 3R, 7B\* (Div. 2) CD, 9 EFG, 12

#### Back Boxes – for use with DS441 and DS442 covers



| Through Feed            | Hub Size                                | Back Box Arrangement |
|-------------------------|-----------------------------------------|----------------------|
| EDSC378                 | 1"                                      | 3 gang tandem        |
| Common Cover Assemblies |                                         |                      |
| Cat. #                  | Description                             |                      |
| DS455 ①                 | With one pilot light                    |                      |
| DS476 ① ②               | With one pilot light and transformer    |                      |
| DS456 ① ①               | With two pilot lights                   |                      |
| DS429§                  | With one pushbutton                     |                      |
| DS454§                  | With two pushbuttons                    |                      |
| DS510 ①§                | With one pushbutton and one pilot light |                      |

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

②Add suffix below for transformer primary voltage:

#### Transformers – Voltages above 125

| Nom. Volts 50–60Hz Transformer | Primary Voltage Range | Suffix |
|--------------------------------|-----------------------|--------|
| 220 / 110                      | 220–240               | T2     |
| 440 / 110                      | 440–480               | T4     |
| 550 / 110                      | 550–600               | T5     |

§ If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |



# EDS / EFS Series Control Stations

## EDSCM Modular Multi-Gang Control Device Bodies

Cl. I, Div. 1, Groups C, D\*  
Cl. I, Div. 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B (Div. 2) CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

**4C**

For use with DSD device cover sub-assemblies see page 521.

### Applications:

Modular control device bodies are for surface mounting combinations of control device equipment for use in:

- Industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas where atmospheres may contain hazardous gases or dusts, and arcing of enclosed devices must not ignite the surrounding atmosphere.
- Conjunction with magnetic starters or contactors for remote control and monitoring motors.
- Manual starting and stopping of small AC or DC motors.
- Controlling and supplying energy to portable electrical devices such as motor generator sets, compressors, conveyors, portable tools, etc.

### Features:

EDSCM Modular Control Stations have many distinct advantages over multiple individual units:

- Reduce installation costs. A multi-gang device assembly can be installed in less time than several single-gang units.
- Seals not required between gangs.
- Improved appearance. No exposed conduit runs between devices.
- Lightweight. Fifteen-gang aluminum device body can be installed by one person.
- Mounting feet are provided on the top and bottom of every gang to facilitate installation.
- Two and three gang tandem bodies have 1 1/4" through feed inward horizontal hubs and 1" or 2" vertical through feed hubs. Pipe plugs are installed in one horizontal hub and both vertical hubs.
- Single-gang device bodies have 1" through feed inward horizontal hubs and 3/4" through feed vertical hubs. Pipe plugs are installed in one horizontal hub and both vertical hubs.
- All hubs are taper tapped and have integral bushings.
- Close nipples, which are used to join two or more device bodies together, are furnished with EDSCM 21, 32, 33, 62 and 63 units.
- Any combination of bodies can be joined together horizontally.

### Certifications and Compliances:

(When used with DSD device sub-assemblies)\*:

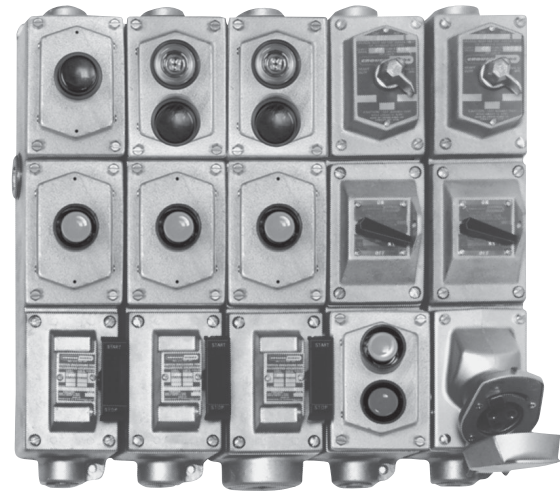
- Class I, Division 1 & 2, Groups C, D
- Class I, Division 2, Group B, C, D
- Class II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- NEMA/EEMAC: 3, 7B (Div.2) CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

### Standard Materials:

- Copper-free aluminum

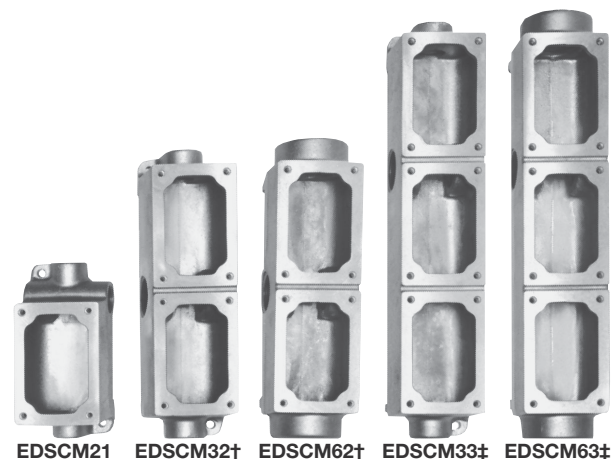
### Finish:

- Natural



**4C**

### Ordering Information



| Description       | Through Feed Hub Size | Cat. #  |
|-------------------|-----------------------|---------|
| Single Gang       | 3/4"                  | EDSCM21 |
| Tandem Two Gang   | 1"                    | EDSCM32 |
| Tandem Two Gang   | 2"                    | EDSCM62 |
| Tandem Three Gang | 1"                    | EDSCM33 |
| Tandem Three Gang | 2"                    | EDSCM63 |

\* When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.

† EDSCM32 and EDSCM62 will not accept covers with S697 or S701 suffixes.

‡ Bottom gang opening will accept covers with S697 or S701 suffixes.

In Class I areas all conduit runs entering bodies must be sealed. As many as five bodies can be joined horizontally without an intervening seal.

## EDS / EFS Series Control Stations

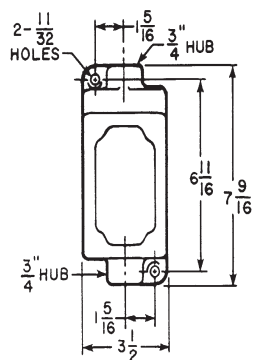
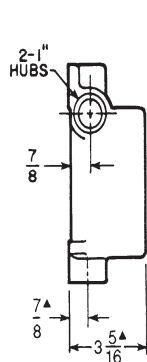
## EDSCM Modular Multi-Gang Control Device Bodies

Cl. I, Div. 1, Groups C, D\*  
Cl. I, Div. 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B (Div. 2) CD, 9EFG

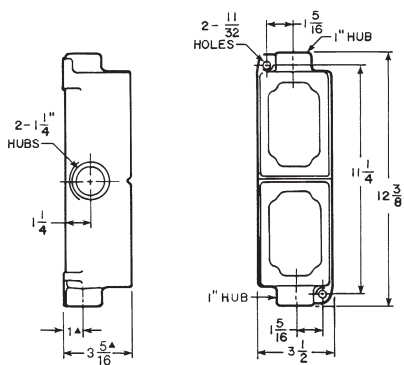
Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

## Dimensions

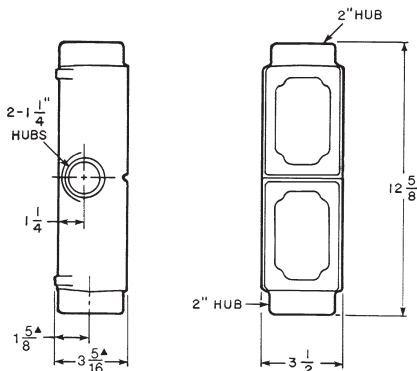
**In Inches:**



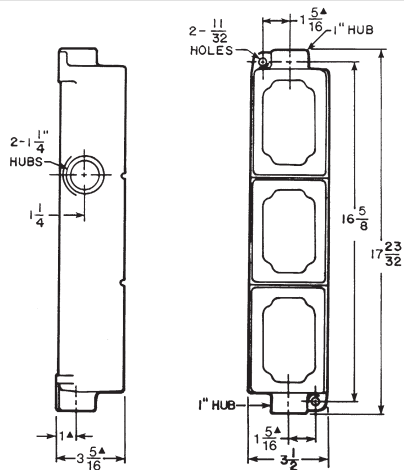
EDSCM21



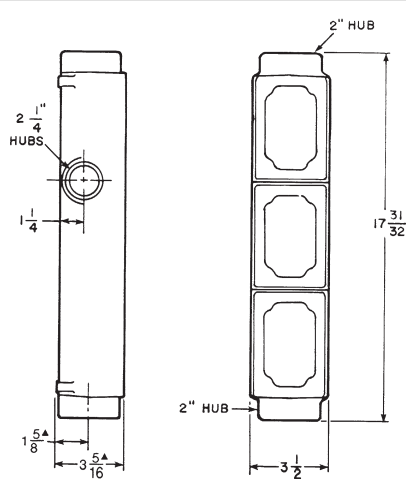
EDSCM32



EDSCM62



EDSCM33



EDSCM63

\* When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.  
Dimensions are approximate. Not for construction purposes.

# EDS / EFS Series Control Stations

## DSD Cover and Device Sub-assemblies

Cl. I, Div. 1 & 2, Groups B\*, C, D†  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C

For use with EDSCM modular control device bodies see page 519 and EDS/EDSC back boxes.

### Features:

- Large machine screws for fastening covers to bodies
- Lockout hole for padlock having 1/4" hasp is provided when used with covers for front lever and side rocker type operation
- Lockout provisions on front operated pushbutton (marked "STOP" and "OFF") and all selector switch covers
- For covers with front lever and side rocker type operating handles, threaded type shafts and bushings are used to ensure flamtightness
- Accurately ground flange for flamtight joint when mated with ground flange on back box

### Certifications and Compliances:

(When used with EDSCM & EDS bodies):

- NEC/CEC:
  - Class I, Division 1 & 2, Groups C, D†
  - Class I, Division 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7B (Div. 2) CD, 9EFG
- UL Standards: 894, 698
- CSA Standard: C22.2 No. 30

Pushbuttons, Pilot Lights & Selector Switches (when used with EFS bodies):

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EEMAC: 3, 7BCD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

### Standard Materials:

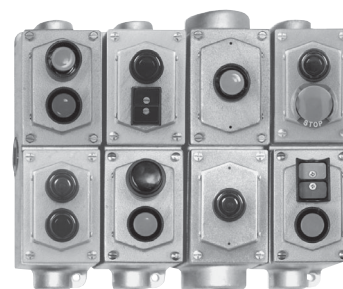
- Covers, front operated – *Feraloy* iron alloy and copper-free aluminum
- Covers, side operated – copper-free aluminum
- Shafts and shaft bushings – stainless steel
- Rocker handles, pushbuttons and guards – type 6 / 6 nylon
- Sealing enclosures – copper-free aluminum

CPS delayed action receptacle cover:

- Receptacle housing – copper-free aluminum
- Insulation – diallyl phthalate (DAP)
- Contacts – brass

### Standard Finishes:

- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural



### Options:

The following special options are available by adding suffix to Cat. #:

| Description                                                                                                                                                                        | Suffix  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| • Lockout provision on front operated pushbutton cover (standard on buttons marked "STOP" and "OFF").....                                                                          | S153    |
| • Three-position selector switches with modified operation:<br>Momentary contact clockwise operation, spring return to center, maintained contact counter-clockwise operation..... | S634    |
| • Momentary contact counter-clockwise operation, spring return to center, maintained contact clockwise operation.....                                                              | S635    |
| • Emergency "STOP" button momentary – front operated mushroom button breaks normally closed contacts (DL02 legend plate included - must specify legend text)                       | S111    |
| • Bodies and covers – copper-free aluminum.....                                                                                                                                    | SA      |
| • For 24 VDC operation on pilot lights.....                                                                                                                                        | S300    |
| • Maintained contact mushroom head with lockout and guard (Will not fit with a pilot light if transformer is required) (Push to stop only).....                                    | S769    |
| • Spring return to center from right and left (For DEV43 or DEV44 only).....                                                                                                       | S842    |
| • Key Operated – removable from all positions.....                                                                                                                                 | S847 K1 |
| • Key Operated – removable from left position for DEV42 or from center for DEV43 and DEV44.....                                                                                    | S847 K2 |
| • Key Operated – removable from right position for DEV42 or from left for DEV43 and DEV44.....                                                                                     | S847 K3 |
| • Key Operated – removable from right position for DEV43 and DEV44.....                                                                                                            | S847 K4 |

### Ordering Information Manual Motor Starters

| Poles                                           | Max. H.P. | Max. Volts A.C. | Cat. #     |
|-------------------------------------------------|-----------|-----------------|------------|
| <b>With Allen-Bradley Bulletin 600 Switches</b> |           |                 |            |
| 1                                               | 1         | 115–230         | DSD910 ①   |
| 2                                               | 1         | 115–230         | DSD911 ①   |
| <b>With General Electric Switches</b>           |           |                 |            |
| 1                                               | 1         | 115–230         | DSD912 ①\$ |
| 2                                               | 1         | 115–230         | DSD913 ①\$ |
| <b>With Cutler-Hammer Switches</b>              |           |                 |            |
| 1                                               | 1         | 115–230         | DSD914 ①\$ |
| 2                                               | 1         | 115–230         | DSD915 ①\$ |
| <b>With Arrow-Hart Switches</b>                 |           |                 |            |
| <b>Without Overload Protection</b>              |           |                 |            |
| 2                                               | 5         | 250 (30A)       | DSD916     |
| 2                                               | 7.5       | 600 (30A)       | DSD916     |
| 3                                               | 7.5       | 250 (30A)       | DSD917     |
| 3                                               | 15        | 600 (20A)       | DSD917     |



† When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.

\* For pushbuttons, pilot lights, & selector switches, use EFS back box with required external conduit seal for 1 inch hub size, within 5 feet for Class I, Division 1, Group B applications.

\$ A comparable factory sealed cover will fit on the EDSCM21 body, EDS and EDSC bodies and in bottom gang of EDSCM33 and EDSCM63 bodies. To order, add suffix S701 to catalog number.

① Includes one interchangeable heater. To select heater see pages 479–480. Symbol 0 (zero) may be used to indicate heater omitted.

## Crouse-Hinds

by **E.T.N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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4C

## EDS / EFS Series Control Stations

### DSD Cover and Device Sub-Assemblies

Cl. I, Div. 1 & 2, Groups B\*, C, D†  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

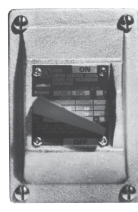
Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations



DSD918



DSD922



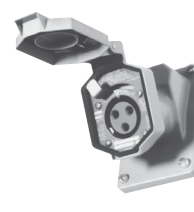
DSD933



DSD962



DSD970



CPS152R



ENR5201

For use with EDSCM modular control device bodies see page 519 & EFS/EDS back boxes.

### Ordering Information

#### Front Operated Pushbutton Stations 600 VAC Heavy Duty, Factory Sealed

| Number of<br>Cover Buttons | Normal<br>Position                                                            | Diagram | Cat. #       |
|----------------------------|-------------------------------------------------------------------------------|---------|--------------|
| 1                          | 1 Circuit<br>Universal                                                        |         | DSD918 ①     |
| 1                          | 2 Circuits<br>Universal                                                       |         | DSD919 ①     |
|                            | 2 Circuits                                                                    |         | DSD920 ①■    |
| 2                          | 2 Circuits<br>Universal                                                       |         | DSD921 ①     |
| 2                          | 2 Circuits<br>Start-Stop<br>unless<br>otherwise<br>specified                  |         | DSD922 ①■    |
| 2                          | 2 Circuits<br>Universal<br>Mushroom Head                                      |         | DSD970 ①     |
| 3 (2-operator)             | 3 Circuits<br>Universal                                                       |         | DSD962 ①     |
| 3 (3-operator)             | 3 Circuits<br>Universal                                                       |         | DS511 ① SA\$ |
| 3 (3-operator)             | 3 Circuits<br>Universal<br>Double pilot light -<br>single pushbutton<br>combo |         | DS513 ① SA\$ |
| 3 (3-operator)             | 3 Circuits<br>Universal<br>Double pushbutton -<br>single pilot light<br>combo |         | DS514 ① SA\$ |

#### Front Operated General Use Snap Switch

| Style  | Amperes<br>120 VAC | 277 VAC | Cat. #  |
|--------|--------------------|---------|---------|
| 1-Pole | 20                 | 20      | DSD933‡ |
| 2-Pole | 20                 | 20      | DSD934‡ |
| 3-Pole | ▲                  | ▲       | DSD935Ⓢ |
| 3-Way  | 20                 | 20      | DSD936‡ |
| 4-Way  | 20                 | 20      | DSD937‡ |
| 1-Pole | 30                 | 30      | DSD939‡ |
| 2-Pole | 30                 | 30      | DSD940‡ |
| 3-Way  | 30                 | 30      | DSD941‡ |

#### Delayed Action Receptacles Factory Sealed

| Rating                                                             | Cat. #                      |
|--------------------------------------------------------------------|-----------------------------|
| 20 A, 1 HP, 125–250 VAC 60 Hertz<br>20 A, 18 VDC                   | CPS152R<br>(2 wire, 3 pole) |
| 30 A, 1½ HP, 125–250 VAC 60 Hertz;<br>7 A, ½ HP, 480 VAC, 60 Hertz | CPS532R<br>(2 wire, 3 pole) |
| 30 A, 3 HP, 125–250 VAC 60 Hertz;<br>7A, 1 HP, 480 VAC, 60 Hertz   | CPS732R<br>(3 wire, 4 pole) |

#### General Purpose, Dead Front Factory Sealed

| Rating        | Cat. #  | Diagram |
|---------------|---------|---------|
| 20 A, 125 VAC | ENR5201 | 5-20R   |
| 20 A, 250 VAC | ENR6202 | 6-20R   |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

\* For pushbuttons, pilot lights, & selector switches, use EFS back box with required external conduit seal for 1 inch hub size, within 5 feet for Class I, Division 1, Group B applications.

† When a CPS receptacle cover device is used, the assembly meets requirements for Class I, Groups C and D areas only.

■ Two universal contact blocks, must be wired as two circuits with one normally open and one normally closed. 1 green button, 1 red button, and lockout provision provided as standard.

▲ 16 Amp., 125V.  
10 Amp., 250V.

‡ To order a comparable factory sealed cover for EDS, EDSC, EDSCM21 and the bottom gang of EDSCM33 and EDSCM63 bodies, add suffix S697. Factory sealed for Class I, Division 2, Group B.

Ⓢ Cannot be factory sealed.

\$ Can only be used with EFD Series 1½ gang back boxes. Pushbuttons include contact blocks. Standard pushbutton color is black. For optional colors - red, green - write in color. Example: DS511 GREEN BLACK RED-SA. First color is for uppermost button. For optional legend markings write in marking after device operator color. Example: DS513-J3 JOG-J1 STOP GREEN-SA.



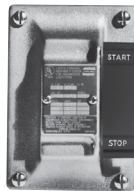
# EDS / EFS Series Control Stations

## DSD Cover and Device Sub-Assemblies

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C



DSD951



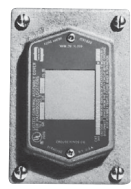
DSD925



DSD947-J1-J1



DSD958



DSD957



DSD961-J1

For use with EDS/SCM modular control device bodies see page 519 & EFS/EDS back boxes.

## Ordering Information Side Operated Pushbutton Station 600 VAC Heavy Duty, Factory Sealed

| Normal Position                                                                      | Diagram | Cat. #   |
|--------------------------------------------------------------------------------------|---------|----------|
| 1 Circuit Universal                                                                  |         | DSD949 ③ |
| 2 Circuits Universal                                                                 |         | DSD950 ③ |
| 2 Circuits<br>1 Open - A<br>1 Closed - B<br>Start-Stop unless<br>otherwise specified |         | DSD951 ③ |

## Selector Switches

### Maintained Contact 600 VAC Heavy Duty, Factory Sealed

|                   | Style | Position 1 | Position 2 | Position 3 | Cat. #   |
|-------------------|-------|------------|------------|------------|----------|
| Two<br>Circuit    | Two   | A1         | A2         |            | DSD923 ④ |
|                   | Four  | A1         | A2         |            |          |
| Two<br>Position   | Four  | A1         | A2         |            | DSD924 ④ |
|                   | Four  | B1         | B2         |            |          |
| Three<br>Circuit  | Two   | A1         | A2         |            | DSD925 ④ |
|                   | Four  | A1         | A2         |            |          |
| Three<br>Position | Four  | A1         | A2         |            | DSD926 ④ |
|                   | Four  | B1         | B2         |            |          |
| Four<br>Circuit   | Two   | A1         | A2         |            | DSD927 ④ |
|                   | Four  | A1         | A2         |            |          |

\* For pushbuttons, pilot lights, & selector switches, use EFS back box with required external conduit seal for 1 inch hub size, within 5 feet for Class I, Division 1, Group B applications. ‡LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED to Cat. No. after last color symbol.

§ Can only be used with EFD Series 1½ gang back boxes. Pushbuttons include contact blocks. Standard pushbutton color is black. For optional colors - red, green - write in color. Example: DS511 GREEN BLACK RED-SA. First color is for uppermost button. For optional legend markings write in marking after device operator color. Example: DS513-J3 JOG-J1 STOP GREEN-SA.

## Crouse-Hinds

by E.T.N

## Pilot Light Devices‡

### Factory Sealed

| Description                                                                                                                                                   | Diagram              | Cat. #      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------|
| With one pilot light                                                                                                                                          |                      | DSD948 ①    |
| With two pilot lights (Not available with a transformer)                                                                                                      |                      | DSD947 ①    |
| With one pilot light and transformer                                                                                                                          |                      | DSD948 ① ②  |
| With one pilot light and pushbutton station                                                                                                                   |                      | DSD958 ①    |
| With one pilot light and 1 double pushbutton station                                                                                                          |                      | DSD961 ①    |
| With one pilot light & transformer and 1 double pushbutton station                                                                                            |                      | DSD961 ① ②  |
| Triple pilot light                                                                                                                                            |                      | DS512 ① SA§ |
| Double pilot light - single pushbutton combo                                                                                                                  |                      | DS513 ① SA§ |
| Double pushbutton - single pilot light combo                                                                                                                  |                      | DS514 ① SA§ |
| 2 position selector switch, two circuit (pos. 1 - N.O., pos. 2 - N.C.)                                                                                        | A1<br>A2             | DSD973 ① ④  |
| 2 position selector switch, four circuit (pos. 1 - N.O., pos. 2 - N.C. for both switches)                                                                     | A1<br>A2<br>B1<br>B2 | DSD974 ① ④  |
| 3 position selector switch, two circuit (pos. 1 - N.O., pos. 2 - open, pos. 3 - N.C.)                                                                         | A1<br>A2             | DSD975 ① ④  |
| 3 position selector switch, four circuit (pos. 1 - N.O., pos. 2 - open, pos. 3 - N.C. for both switches)                                                      | A1<br>A2<br>B1<br>B2 | DSD976 ① ④  |
| 3 position selector switch, four circuit (pos. 1 - N.C., pos. 2 - N.O., pos. 3 - N.O. for switch A; pos. 1 - N.O., pos. 2 - N.O., pos. 3 - N.C. for switch B) | A1<br>A2<br>B1<br>B2 | DSD977 ① ④  |

## Blank Cover

| Description | Cat. # |
|-------------|--------|
|-------------|--------|

Blank Cover DSD957

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

②Add suffix below for transformer primary voltage:

### Transformers – Voltages above 125

| Nom. Volts 50–60Hz Transformer | Primary Voltage Range | Suffix |
|--------------------------------|-----------------------|--------|
| 220 / 110                      | 220–240               | T2     |
| 440 / 110                      | 440–480               | T4     |
| 550 / 110                      | 550–600               | T5     |

③ If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

④ Specify indicating plate markings. Standard indicating plate markings available are as follows:

### Two-Position

|                  |             |              |
|------------------|-------------|--------------|
| RUN, JOG         | FAST, SLOW  | IN, OUT      |
| HAND, AUTOMATIC  | OPEN, CLOSE | RAISE, LOWER |
| FORWARD, REVERSE | UP, DOWN    | START, STOP  |
|                  | ON, OFF     |              |

### Three-Position

|                       |                  |
|-----------------------|------------------|
| JOG, OFF, RUN         | 1, OFF, 2        |
| AUTOMATIC, OFF, HAND  | OPEN, OFF, CLOSE |
| FORWARD, OFF, REVERSE | UP, OFF, DOWN    |
| FAST, OFF, SLOW       |                  |

4C

## EDS / EFS Series Control Stations

**DSD-SR Series Horsepower Rated Selector Switch\***  
**30 A, 600 V; Front Operated**

Cl. I, Groups C & D  
Cl. II, Groups E, F & G  
Cl. III  
Enclosure 3, 5 & 12

### Ordering Information

| Switch Function                                                       | Cat. #      | Number of Poles | Number of Positions | Connecting Diagram |
|-----------------------------------------------------------------------|-------------|-----------------|---------------------|--------------------|
| ON/OFF                                                                | DSD SR30120 | 1               | 2                   |                    |
|                                                                       | DSD SR30220 | 2               | 2                   |                    |
|                                                                       | DSD SR30320 | 3               | 2                   |                    |
|                                                                       | DSD SR30420 | 4               | 2                   |                    |
|                                                                       | DSD SR30520 | 5               | 2                   |                    |
|                                                                       | DSD SR30620 | 6               | 2                   |                    |
|                                                                       |             |                 |                     | 1-6 Pole           |
| DOUBLE-THROW<br>without OFF                                           | DSD SR30121 | 1               | 2                   |                    |
|                                                                       | DSD SR30221 | 2               | 2                   |                    |
|                                                                       | DSD SR30321 | 3               | 2                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |
| DOUBLE-THROW<br>without OFF<br>with electrically<br>isolated contacts | DSD SR30123 | 1               | 2                   |                    |
|                                                                       | DSD SR30223 | 2               | 2                   |                    |
|                                                                       | DSD SR30323 | 3               | 2                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |
| DOUBLE-THROW<br>with OFF                                              | DSD SR30132 | 1               | 3                   |                    |
|                                                                       | DSD SR30232 | 2               | 3                   |                    |
|                                                                       | DSD SR30332 | 3               | 3                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |
| DOUBLE-THROW<br>with OFF<br>and electrically<br>isolated contacts     | DSD SR30134 | 1               | 3                   |                    |
|                                                                       | DSD SR30234 | 2               | 3                   |                    |
|                                                                       | DSD SR30334 | 3               | 3                   |                    |
|                                                                       |             |                 |                     | 1-3 Pole           |

### Electrical Specification

| Voltage | Horsepower Rating |     |
|---------|-------------------|-----|
|         | 3PH               | 1PH |
| 120     | 3                 | 1.5 |
| 240     | 7.5               | 3   |
| 480     | 10                | 5   |
| 600     | 10                | 5   |

Maximum Current: 30 A

Heavy-duty A600 rating

### Options:

#### Description

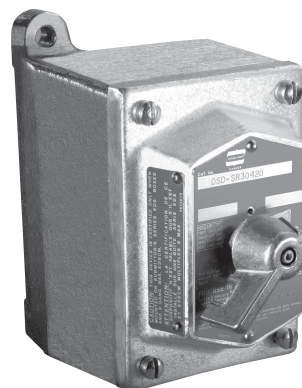
Lockout for 2 position switch, handle in either position

Lockout for 3 position switch, handle in either position

\*For CEC applications only.

Suffix  
**SX178**

**S349**



**DSD-SR cover assembly shown  
mounted to an EDS back box**

# EDS / EFS Series Control Stations

## Fully Assembled EFS and EDS Factory Sealed Devices

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C

### Applications:

Factory sealed enclosures are installed in a rigid metallic conduit system for surface mounting adjacent to or remote from equipment being controlled and are used:

- To prevent arcing of enclosed device from causing ignition of a specific hazardous atmosphere or atmospheres external to the enclosure
- In industrial areas such as chemical plants, oil and gas refineries, paint and varnish manufacturing plants, gasoline bulk loading terminals, grain elevators, grain processing industries, coal processing or handling areas, or metal handling or finishing areas where atmosphere may contain hazardous gases and/or dust
- In non-hazardous areas where sturdy, durable enclosures are required
- In conjunction with magnetic starters or contactors for remote control of motors

Manual motor starting switch enclosures are used:

- For manual starting of small AC or DC motors
- To provide manual starting and stopping and, in the case of units with heaters, motor running protection

### Features:

Factory sealed devices have many distinct advantages:

- Reduce installation problems
- Eliminate external seals
- Lower installation costs
- Improve safety
- Are used with general purpose snap and pushbutton type switches
- Standard neoprene covers for front operated pushbuttons. Prevents accumulation of dirt and entrance of water around operating shafts
- Mounting lugs and taper tapped hubs with integral bushings
- Large machine screws for fastening covers to bodies
- Lockout provisions on front operated pushbutton (marked "STOP" and "OFF") and selector switch covers
- Lockout hole for padlock having 1/4" hasp is provided when used with covers for front lever and side rocker type operation
- Close tolerances in machining of wide, mating flanges and journaled shafts and bearings for front button operation, produces flamtightness of enclosure joints
- On enclosures with front lever and side rocker type operating handles, threaded type shafts and bushings are used to ensure flamtightness
- Dead end (EFS or EDS) or through feed (EFSC or EDSC) hubs – 1/2" to 1" sizes
- When STOP is indicated, button is automatically red. When START is indicated, button is automatically green. Otherwise, black buttons are standard.

### Certifications and Compliances:

- NEC/CEC:
  - Class I, Division 1 & 2, Groups B\*, C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA/EMAC: 3, 7B\*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

### Standard Materials:

- Bodies – *Feraloy*® iron alloy; copper-free aluminum
- Front operated pushbutton and pilot light covers – *Feraloy* iron alloy
- Side operated type pushbutton covers – copper-free aluminum
- Shafts – stainless steel
- Shaft bushings – stainless steel
- Rocker handle and pushbutton guards – type 6 / 6 nylon
- Sealing enclosures – copper-free aluminum

### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Type 6 / 6 nylon – black
- Stainless steel – natural

### Options:

The following special options are available from the factory by adding suffix to Cat. #:

| Description                                                                                                                                                                                                    | Suffix      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| • Emergency "Stop" button (momentary) – front operated red mushroom button.....                                                                                                                                | <b>S111</b> |
| • Lockout provision on front operated pushbutton cover (standard on buttons marked "OFF" and "STOP").....                                                                                                      | <b>S153</b> |
| • For 24 VDC operation on pilot lights .....                                                                                                                                                                   | <b>S300</b> |
| • Three-position selector switches with modified operation: Momentary contact clockwise operation, spring return to center, maintained contact counter-clockwise operation                                     | <b>S634</b> |
| • Momentary contact counter-clockwise operation, spring return to center, maintained contact clockwise operation....                                                                                           | <b>S635</b> |
| • Bodies and covers (single and two gang units) – copper-free aluminum.....                                                                                                                                    | <b>SA</b>   |
| • Where indicated in the catalog listings, EDS units suitable for Class I, Division 1, Group B usage can be supplied, add suffix -GB, EFS units are suitable for Class I, Division 1, Group B as standard..... | <b>GB</b>   |
| • Maintained contact mushroom head with lockout and guard. May not be combined with a pilot light if a transformer is required. (Push to stop only) .....                                                      | <b>S769</b> |
| • Spring return to center from right and left .....                                                                                                                                                            | <b>S842</b> |

EDS bodies and factory sealed cover and device sub-assemblies are available for field assembly (see page 521).

\*See suffix GB in Options section



4C

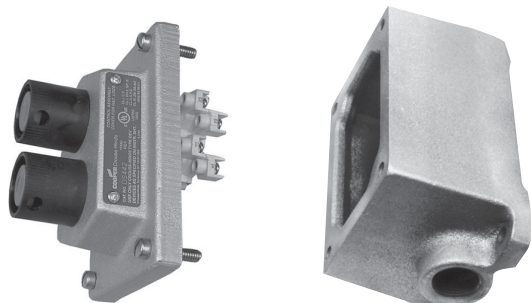
## EDS / EFS Series Control Stations

Fully Assembled EFS and  
EDS Factory Sealed Devices

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

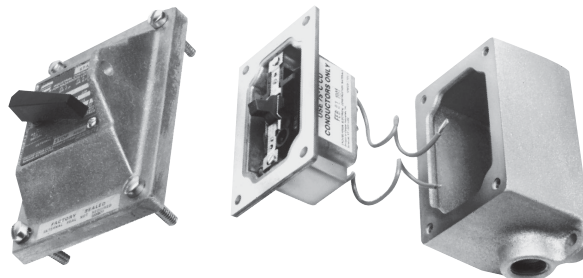
### Methods of Factory Sealing

#### EFS/EDS Series



Factory sealed EDS and EFS pilot light, pushbutton and selector switch control stations do not need external sealing. Device contacts are factory sealed in explosionproof ESWP contact blocks. Small, compact enclosures have accurately ground wide flanges on both the body and cover for a flame-tight joint.

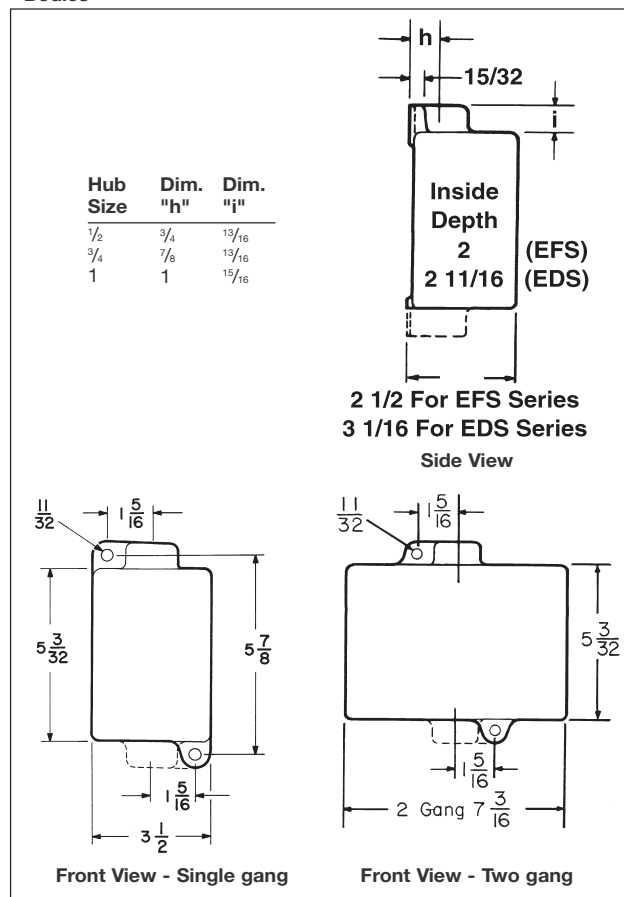
#### EDS Series



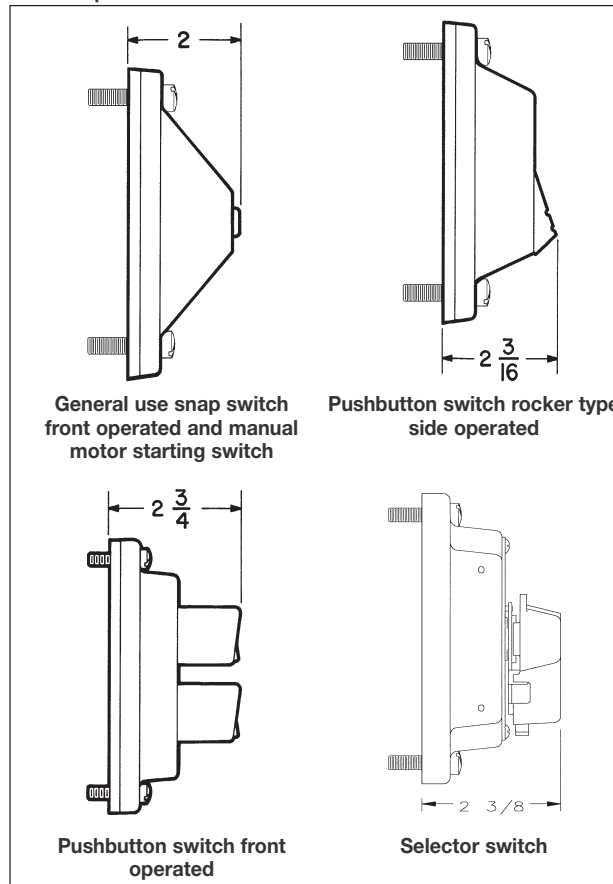
EDS factory sealed snap switches or manual motor starting switches do not need external sealing. The switches are enclosed in a unique sealing well with double flanges which mate with the cover and the body. Small, compact enclosures have accurately ground wide flanges on body, cover and sealing well for flame-tight joints. Wiring pigtails are factory sealed from under the sealing well. Reliable pouring of seals at the factory ensures safe sealing.

### Dimensions (Inches) ‡

#### Bodies



#### Covers†



\*See suffix GB in Options section.

‡Dimensions are approximate, not for construction purposes.

† Surface covers have same length and width as bodies.

# EDS / EFS Series Control Stations

**Fully Assembled EDS Factory Sealed  
Pushbutton Stations  
Front Operated, 600VAC Heavy Duty**

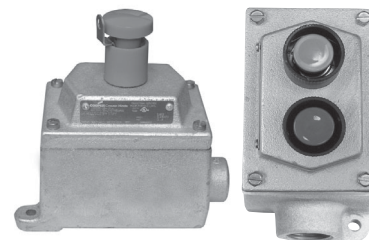
Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**4C**

## Ordering Information - Single Gang

| Normal Pos. | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                           | 2 Circuits<br>Universal | 2 Circuits■ |
|-------------|------------------------|-------------------------|---------------------------------------|-------------------------|-------------|
| Marking     | Specify                | Specify                 | START-STOP unless otherwise specified | Specify                 | Specify     |
| Diagram     |                        |                         |                                       |                         |             |

Replacement Pushbutton Contacts - see page 571



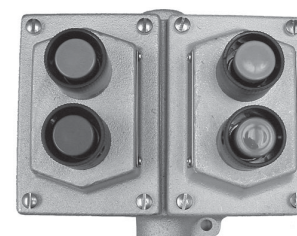
EDS2184 S769

EDS215

Maintained  
Mushroom Head

## Enclosure with Pushbuttons

| Hub Size | Cat. #              | Cat. #     | Cat. #    | Cat. #§    | Cat. #§    |
|----------|---------------------|------------|-----------|------------|------------|
|          | <b>Dead End</b>     |            |           |            |            |
| 1/2      | EDS1184 ①           |            | EDS115 ①  |            | EDS1155 ①  |
| 3/4      | EDS2184 ①           | EDS2190 ①  | EDS215 ①  | EDS2192 ①  | EDS2155 ①  |
| 1        | EDS3184 ①           | EDS3190 ①  | EDS315 ①  | EDS3192 ①  | EDS3155 ①  |
|          | <b>Through Feed</b> |            |           |            |            |
| 1/2      | EDSC1184 ①          | EDSC1190 ① | EDSC115 ① | EDSC1192 ① | EDSC1155 ① |
| 3/4      | EDSC2184 ①          | EDSC2190 ① | EDSC215 ① | EDSC2192 ① | EDSC2155 ① |
| 1        | EDSC3184 ①          | EDSC3190 ① | EDSC315 ① | EDSC3192 ① | EDSC3155 ① |



EDSC225

## Ordering Information - Two Gang

| Normal Pos. | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                           |
|-------------|------------------------|-------------------------|---------------------------------------|
| Marking     | Specify                | Specify                 | START-STOP unless otherwise specified |
| Diagram     |                        |                         |                                       |

Replacement Pushbuttons‡ ED11 ED12 ED12■

## Enclosure with Pushbuttons

| Hub Size | Cat. #              | Cat. #     | Cat. #    |
|----------|---------------------|------------|-----------|
|          | <b>Dead End</b>     |            |           |
| 3/4      | EDS2284 ①           | EDS2290 ①  | EDS225 ①  |
| 1        | EDS3284 ①           | EDS3290 ①  | EDS325 ①  |
|          | <b>Through Feed</b> |            |           |
| 1/2      | EDSC1284 ①          | EDSC1290 ① | EDSC125 ① |
| 3/4      | EDSC2284 ①          | EDSC2290 ① | EDSC225 ① |
| 1        | EDSC3284 ①          | EDSC3290 ① | EDSC325 ① |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

\* Class I, Group B: Consider using EFS series pushbuttons, see page 528. All enclosures listed above can be modified for Class I, Group B, Div. 1 usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. These products are suitable for Group B, Div. 2 as listed, without external seals. In Canada, for Group B applications consult factory.

■ Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

§ Single external button operates both inner buttons simultaneously.

## Dimensions

see page 526

# 4C EDS / EFS Series Control Stations

**Fully Assembled EFS Factory Sealed  
Pushbutton Stations  
Front Operated, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

## Ordering Information

| Normal Pos.                | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                                        | 2 Circuits<br>Universal | 2 Circuits■ |
|----------------------------|------------------------|-------------------------|----------------------------------------------------|-------------------------|-------------|
| Marking                    | Specify                | Specify                 | START-<br>STOP<br>unless<br>otherwise<br>specified | Specify                 | Specify     |
| Diagram                    |                        |                         |                                                    |                         |             |
| Replacement<br>Pushbutton§ | ED11                   | ED12                    | ED12■                                              | ED12                    | ED12■       |
| Enclosure with Pushbuttons |                        |                         |                                                    |                         |             |
| Hub Size                   | Cat. #                 | Cat. #                  | Cat. #                                             | Cat. #§                 | Cat. #§     |
| <b>Dead End</b>            |                        |                         |                                                    |                         |             |
| 1/2                        | EFS1184 ①              |                         | EFS115 ①                                           |                         | EFS1155 ①   |
| 3/4                        | EFS2184 ①              | EFS2190 ①               | EFS215 ①                                           | EFS2192 ①               | EFS2155 ①   |
| 1                          | EFS3184 ①              | EFS3190 ①               | EFS315 ①                                           | EFS3192 ①               | EFS3155 ①   |
| <b>Through Feed</b>        |                        |                         |                                                    |                         |             |
| 1/2                        | EFSC1184 ①             | EFSC1190 ①              | EFSC115 ①                                          | EFSC1192 ①              | EFSC1155 ①  |
| 3/4                        | EFSC2184 ①             | EFSC2190 ①              | EFSC215 ①                                          | EFSC2192 ①              | EFSC2155 ①  |
| 1                          | EFSC3184 ①             | EFSC3190 ①              | EFSC315 ①                                          | EFSC3192 ①              | EFSC3155 ①  |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

\*Class I, Group B: All enclosures listed above are suitable for Class I, Group B, Div. 1 usage. Seals only have to be installed on 1 inch conduit within 5 ft. in Division 1.

‡For replacement contact blocks, see page 571.

■Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

§Single external button operates both inner buttons simultaneously.



**EFS2184 START**  
Standard black  
pushbutton



**EFS215**

## Dimensions

see page 526

# EDS / EFS Series Control Stations

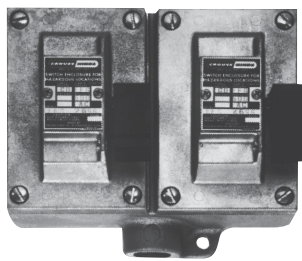
**Fully Assembled EDS Factory Sealed  
Pushbutton Stations  
Side Rocker Handle, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**4C**



EDSC2162



EDS2696

## Dimensions

see page 526

## Ordering Information - Single Gang

| Normal Pos.                 | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits■                                    |
|-----------------------------|------------------------|-------------------------|------------------------------------------------|
| Marking                     | Specify                | Specify                 | START-STOP<br>unless<br>otherwise<br>specified |
| Diagram                     |                        |                         |                                                |
| Replacement<br>Pushbuttons‡ | ED11                   | ED12                    | ED12■                                          |

### Enclosure with Pushbuttons

| Hub Size            | Cat. #     | Cat. #     | Cat. #     |
|---------------------|------------|------------|------------|
| <b>Dead End</b>     |            |            |            |
| 1/2                 | EDS1596 ①  |            | EDS1162 ①  |
| 3/4                 | EDS2596 ①  | EDS2194 ①  | EDS2162 ①  |
| 1                   | EDS3596 ①  | EDS3194 ①  | EDS3162 ①  |
| <b>Through Feed</b> |            |            |            |
| 1/2                 | EDSC1596 ① | EDSC1194 ① | EDSC1162 ① |
| 3/4                 | EDSC2596 ① | EDSC2194 ① | EDSC2162 ① |
| 1                   | EDSC3596 ① | EDSC3194 ① | EDSC3162 ① |

## Two Gang

| Normal Pos.                 | 1 Circuit<br>Universal | 2 Circuits<br>Universal | 2 Circuits                                     |
|-----------------------------|------------------------|-------------------------|------------------------------------------------|
| Marking                     | Specify                | Specify                 | START-STOP<br>unless<br>otherwise<br>specified |
| Diagram                     |                        |                         |                                                |
| Replacement<br>Pushbuttons‡ | ED11                   | ED12                    | ED12■                                          |

### Enclosure with Pushbuttons

| Hub Size            | Cat. #     | Cat. #     | Cat. #     |
|---------------------|------------|------------|------------|
| <b>Dead End</b>     |            |            |            |
| 3/4                 | EDS2696 ①  | EDS2294 ①  | EDS2262 ①  |
| 1                   | EDS3696 ①  | EDS3294 ①  | EDS3262 ①  |
| <b>Through Feed</b> |            |            |            |
| 1/2                 | EDSC1696 ① | EDSC1294 ① | EDSC1262 ① |
| 3/4                 | EDSC2696 ① | EDSC2294 ① | EDSC2262 ① |
| 1                   | EDSC3696 ① | EDSC3294 ① | EDSC3262 ① |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

\*Class I, Group B: All enclosures listed above can be modified for Class I, Group B, Div. 1 usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. These products are suitable for Group B, Div. 2 as listed, without external seals.

‡For replacement contact blocks, see page 571.

■ Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

## 4C

## EDS / EFS Series Control Stations

### Fully Assembled EFS Pilot Lights

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

### Applications:

EFS pilot lights are used:

- In areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To visually indicate at a remote location that the desired function is being performed

### Features:

- Small, compact enclosures with accurately ground flange on both body and cover for flame-tight joint
- Pilot lights are factory sealed. Conventional external seals are not required
- Dead end (EFS) or through feed (EFSC) hubs – 1/2" to 1" sizes

### Certifications and Compliances:

- NEC/CEC:
  - Class I, Groups B\*, C, D
  - Class II, Groups E, F, G
  - Class III
- NEMA/EEMAC: 3, 7B\*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2

### Standard Materials:

- Bodies – *Feraloy*® iron alloy (U.S.) and copper-free aluminum (Canada)
- Pilot light covers – *Feraloy* iron alloy
- Operating shafts – stainless steel

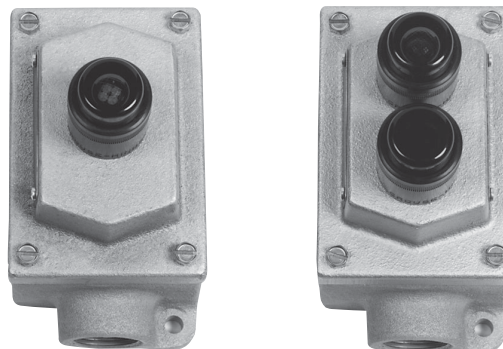
### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized with aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

### Electrical Rating Range:

- Pilot lights – 110 to 600VAC

\* External conduit seal required for 1 inch hub size in Division 1, Group B within 5 feet (1.5 meters) of enclosure.



### Options:

The following special options are available from factory by adding suffix to Cat. #:

| Description                                                                                               | Suffix |
|-----------------------------------------------------------------------------------------------------------|--------|
| Pilot lights for circuit voltages up to 600 volts maximum (standard voltage range 110–125) – See Listings |        |
| LED pilot lights in place of standard incandescent pilot lamps                                            | LED    |
| Bodies and covers – copper-free aluminum                                                                  | SA     |
| 24 VDC operation on pilot lights                                                                          | S300   |

# EDS / EFS Series Control Stations

## Fully Assembled EFS Pilot Lights

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C

Pilot lights listed below are factory sealed and do not require external seals\*. Lamps are 6 watt, miniature bayonets, incandescent lamps for use on 110–125 volt circuits.

LED pilot lights can be provided in place of standard incandescent lamps by adding suffix LED after the color symbols. For Options see pages 530–531.

Enclosures with single pilot covers **only** can be equipped with a transformer for each lamp for high voltages as shown.

### Transformer Voltages Above 125

| Nominal Volts<br>50–60 Hertz<br>Transformer | Primary<br>Voltage<br>Range | Cat. #<br>Suffix |
|---------------------------------------------|-----------------------------|------------------|
| 220 / 110                                   | 220–240                     | T2               |
| 440 / 110                                   | 440–480                     | T4               |
| 550 / 110                                   | 550–600                     | T5               |

## Ordering Information

### Enclosure with Single Pilot Light†

| Hub Size | Dead End Cat. # | Through Feed Cat. # |
|----------|-----------------|---------------------|
| 1/2      | EFS11524 ①      | EFSC11524 ①         |
| 3/4      | EFS21524 ①      | EFSC21524 ①         |
| 1        | EFS31524 ①      | EFSC31524 ①         |

### Enclosure with Double Pilot Lights†

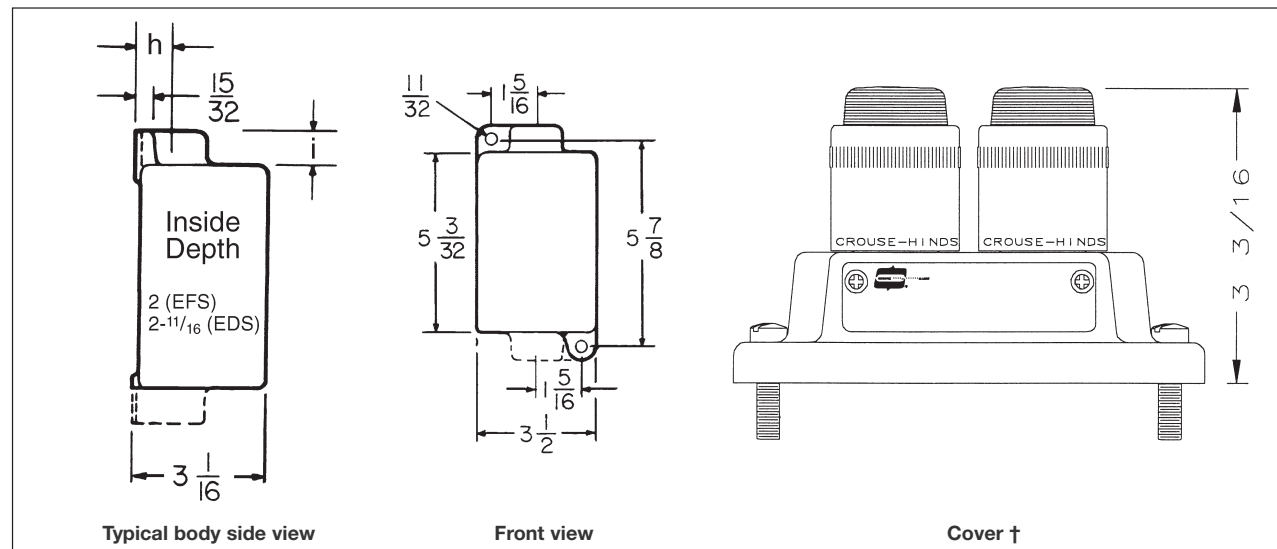
| Hub Size | Dead End Cat. # | Through Feed Cat. # |
|----------|-----------------|---------------------|
| 1/2      | EFS11561 ①      | EFSC11561 ①         |
| 3/4      | EFS21561 ①      | EFSC21561 ①         |
| 1        | EFS31561 ①      | EFSC31561 ①         |

① Add color symbol for each pilot light from table below. Example: EFS11561 with red and green lights is EFS11561-J1-J3

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

## Dimensions

### In Inches:



Dimensions are approximate, not for construction purposes.

| Hub Size | Dim. "h" | Dim. "i" |
|----------|----------|----------|
| 1/2      | 3/4      | 13/16    |
| 3/4      | 7/8      | 13/16    |
| 1        | 1        | 15/16    |

\* External conduit seal required for 1 inch hub size in Division 1, Group B within 5 feet (1.5 meters) of enclosure.

† LED pilot lights can be furnished in place of standard incandescent pilot lamps.

‡ Add suffix LED to catalog number after color symbol.

† Surface covers have same length and width dimensions as bodies.

## Crouse-Hinds

by E.T.N

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4C

## 4C EDS / EFS Series Control Stations

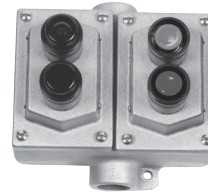
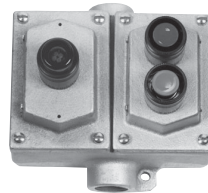
**Fully Assembled EDS Factory Sealed  
Combination Pushbutton and Pilot Light  
Stations 600VAC, Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

Pushbutton contacts and pilot light receptacles are sealed in separate chambers. External seals are not required. Lamps† are 6 watt, type S6, candelabra base for use on 110–125 volt circuits.

Two gang units with single pilot light covers can be furnished with transformers. Specify markings for each button. See table below listings.



**Dimensions**  
see page 526

4C

### Ordering Information - Single Gang

| Description       | Dead End | Through Feed |
|-------------------|----------|--------------|
| No. Pushbuttons   | 1        | 1            |
| No. Pilot Lights† | 1        | 1            |
| Diagram           |          |              |

| Hub Size | Cat. #      | Cat. #       |
|----------|-------------|--------------|
| 1/2      | EDS11473 ①② | EDSC11473 ①② |
| 3/4      | EDS21473 ①② | EDSC21473 ①② |
| 1        | EDS31473 ①② | EDSC31473 ①② |

### Ordering Information - Two Gang

|                   | Dead End | Through Feed | Dead End | Through Feed |
|-------------------|----------|--------------|----------|--------------|
| No. Pushbuttons   | 2        | 2            | 2        | 2            |
| No. Pilot Lights† | 1        | 1            | 2        | 2            |
| Diagram           |          |              |          |              |

| Hub Size | Cat. #      | Cat. #       | Hub Size | Cat. #      | Cat. #       | Cat. #      | Cat. #       |
|----------|-------------|--------------|----------|-------------|--------------|-------------|--------------|
| 1/2      | EDS12471 ①② | EDSC12471 ①② | 1/2      | EDS22471 ①② | EDSC22471 ①② | EDS22868 ①② | EDSC22868 ①② |
| 3/4      | EDS22471 ①② | EDSC22471 ①② | 3/4      | EDS32471 ①② | EDSC32471 ①② | EDS32868 ①② | EDSC32868 ①② |
| 1        | EDS32471 ①② | EDSC32471 ①② | 1        |             |              |             |              |

① Add color symbol for each pilot light from table below. Example: EDS21473 with a red light is EDS21473-J1

| Color | Symbol | Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|-------|--------|
| Red   | J1     | Amber | J6     | Blue  | J11    |
| Green | J3     | Clear | J10    |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |           |       |      |          |      |           |     |
|-------|-----------|-------|------|----------|------|-----------|-----|
| START | LIGHT ON  | DOWN  | RUN  | FORWARD  | ON   | AUTOMATIC | OUT |
| STOP  | EMERGENCY | RAISE | TRIP | CLOSE IN | JOG  | REVERSE   |     |
| RESET | OPEN      | STOP  | HAND | LOWER    | TEST | UP        |     |

\* All enclosures listed above can be modified for Class I, Group B, Division 1 usage. Add suffix GB to the Cat. No. Example: EDS11473-J1-GB. Conduit seal(s) must be installed within 1 1/2" of each conduit opening. These products are suitable for Group B, Div. 2 as listed, without external conduit seals.

† LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED to catalog number after color symbol. For 24 VDC operation on pilot lights add suffix S300.



# EDS / EFS Series Control Stations

**Fully Assembled EDS Factory Sealed  
Selector Switches  
Maintained Contact, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

**4C**

Furnished with pushbuttons, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below. Specify indicating plate markings. See table below listings.



EDS11273

## Dimensions

see page 526

## Ordering Information - Single Gang

| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks† | Enclosure with Switch |                 |                     |
|--------------------------------|------------|------------|------------|-----------------------------|-----------------------|-----------------|---------------------|
|                                |            |            |            |                             | Hub Size              | Dead End Cat. # | Through Feed Cat. # |
| Two-Position, Two-Circuit      | A1         |            |            | ED11                        | 1/2                   | EDS11271 ①      | EDSC11271 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21271 ①      | EDSC21271 ①         |
|                                |            |            |            |                             | 1                     | EDS31271 ①      | EDSC31271 ①         |
| Two-Position, Four-Circuit     | A1         |            |            | ED12                        | 1/2                   | EDS11272 ①      | EDSC11272 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21272 ①      | EDSC21272 ①         |
|                                | B1         |            |            |                             | 1                     | EDS31272 ①      | EDSC31272 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
| Three-Position, Two-Circuit ‡  | A1         |            |            | ED11                        | 1/2                   | EDS11273 ①      | EDSC11273 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21273 ①      | EDSC21273 ①         |
|                                |            |            |            |                             | 1                     | EDS31273 ①      | EDSC31273 ①         |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED12                        | 1/2                   | EDS11274 ①      | EDSC11274 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21274 ①      | EDSC21274 ①         |
|                                | B1         |            |            |                             | 1                     | EDS31274 ①      | EDSC31274 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
|                                | A1         |            |            | ED12                        | 1/2                   | EDS11275 ①      | EDSC11275 ①         |
|                                | A2         |            |            |                             | 3/4                   | EDS21275 ①      | EDSC21275 ①         |
|                                | B1         |            |            |                             | 1                     | EDS31275 ①      | EDSC31275 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Two-Position

RUN, JOG  
HAND, AUTOMATIC  
FORWARD, REVERSE

FAST, SLOW  
OPEN, CLOSE  
UP, DOWN  
ON, OFF

IN, OUT  
RAISE, LOWER  
START, STOP

### Three-Position

RUN, OFF, JOG  
HAND, OFF, AUTOMATIC  
FORWARD, OFF, REVERSE  
FAST, OFF, SLOW

1, OFF, 2  
OPEN, OFF, CLOSE  
UP, OFF, DOWN

\*For Class I, Group B: Consider using EFS series selector switches, see page 534. All enclosures listed above can be modified for Class I, Group B, Div. 1 usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. These products are suitable for Group B, Div. 2 as listed, without external seals. In Canada, for Group B applications consult factory.

† For replacement contact blocks, see page 571.

‡ Suffixes S634 or S635 may be used on these catalog numbers. See page 525 for explanation of options.

**Crouse-Hinds**

by **Eaton**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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# 4C EDS / EFS Series Control Stations

**Fully Assembled EFS Factory Sealed  
Selector Switches  
Maintained Contact, 600VAC Heavy Duty**

Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

Furnished with pushbuttons, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below. Specify indicating plate markings. See table below listings.



EFS11273

**Dimensions**  
see page 526

## Ordering Information - Single Gang

| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks† | Enclosure with Switch |                 |                     |
|--------------------------------|------------|------------|------------|-----------------------------|-----------------------|-----------------|---------------------|
|                                |            |            |            |                             | Hub Size              | Dead End Cat. # | Through Feed Cat. # |
| Two-Position, Two-Circuit      | A1         |            |            | ED11                        | 1/2                   | EFS11271 ①      | EFSC11271 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21271 ①      | EFSC21271 ①         |
|                                |            |            |            |                             | 1                     | EFS31271 ①      | EFSC31271 ①         |
| Two-Position, Four-Circuit     | A1         |            |            | ED12                        | 1/2                   | EFS11272 ①      | EFSC11272 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21272 ①      | EFSC21272 ①         |
|                                | B1         |            |            |                             | 1                     | EFS31272 ①      | EFSC31272 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
| Three-Position, Two-Circuit ‡  | A1         |            |            | ED11                        | 1/2                   | EFS11273 ①      | EFSC11273 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21273 ①      | EFSC21273 ①         |
|                                |            |            |            |                             | 1                     | EFS31273 ①      | EFSC31273 ①         |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED12                        | 1/2                   | EFS11274 ①      | EFSC11274 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21274 ①      | EFSC21274 ①         |
|                                | B1         |            |            |                             | 1                     | EFS31274 ①      | EFSC31274 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |
|                                | A1         |            |            | ED12                        | 1/2                   | EFS11275 ①      | EFSC11275 ①         |
|                                | A2         |            |            |                             | 3/4                   | EFS21275 ①      | EFSC21275 ①         |
|                                | B1         |            |            |                             | 1                     | EFS31275 ①      | EFSC31275 ①         |
|                                | B2         |            |            |                             |                       |                 |                     |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Two-Position

|                  |             |              |
|------------------|-------------|--------------|
| RUN, JOG         | FAST, SLOW  | IN, OUT      |
| HAND, AUTOMATIC  | OPEN, CLOSE | RAISE, LOWER |
| FORWARD, REVERSE | UP, DOWN    | START, STOP  |
|                  | ON, OFF     |              |

### Three-Position

|                       |                  |
|-----------------------|------------------|
| RUN, OFF, JOG         | 1, OFF, 2        |
| HAND, OFF, AUTOMATIC  | OPEN, OFF, CLOSE |
| FORWARD, OFF, REVERSE | UP, OFF, DOWN    |
| FAST, OFF, SLOW       |                  |

\*Class I, Group B: All enclosures listed above are suitable for Class I, Group B, Div. 1 usage. Seals only have to be installed on 1 inch conduit within 5 ft. in Division 1.

† For replacement contact blocks, see page 571.

‡ Suffixes S634 or S635 may be used on these catalog numbers. See page 525 for explanation of options.

EDS / EFS Series Control Stations

Fully Assembled EDS Factory Sealed  
General Use Snap Switches

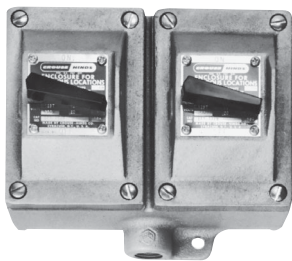
Cl. I, Div. 1 & 2, Groups B\*, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 7B\*CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

4C



EDSC2129



EDS2229

Dimensions  
see page 526

Ordering Information - General Use Snap Switch – Front Operated

| Hub<br>Size | Style† | Amperes |         | Single Gang        |                        | Two Gang‡          |                        | Factory Sealed<br>Replacement<br>Switch |
|-------------|--------|---------|---------|--------------------|------------------------|--------------------|------------------------|-----------------------------------------|
|             |        | 120VAC§ | 277VAC§ | Dead End<br>Cat. # | Through<br>Feed Cat. # | Dead End<br>Cat. # | Through<br>Feed Cat. # |                                         |
|             |        |         |         |                    |                        |                    |                        |                                         |
| ¾           | 1-pole | 20      | 20      | EDS2129            | EDSC2129†              | EDS2229            | EDSC2229†              | SW5                                     |
| ¾           | 2-pole | 20      | 20      | EDS218             | EDSC218†               |                    | EDSC228†               | SW6                                     |
| ¾           | 3-way  | 20      | 20      | EDS2130            | EDSC2130               | EDS2230            | EDSC2230               | SW7                                     |
| ¾           | 4-way  | 20      | 20      | EDS2140            | EDSC2140               |                    | EDSC2240               | SW8                                     |
| 1           | 1-pole | 20      | 20      | EDS3129            | EDSC3129†              | EDS3229            | EDSC3229†              | SW5                                     |
| 1           | 2-pole | 20      | 20      | EDS318             | EDSC318†               | EDS328             | EDSC328†               | SW6                                     |
| 1           | 3-way  | 20      | 20      | EDS3130            | EDSC3130               | EDS3230            | EDSC3230               | SW7                                     |
| 1           | 4-way  | 20      | 20      | EDS3140            | EDSC3140               | EDS3240            | EDSC3240               | SW8                                     |

\*Standard as Class I, Division 2, Group B. No seals required. For Class I, Division 1, Group B: All units on this page can be modified for Class I, Division 1, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1.  
† ON-OFF standard marking for 1-pole and 2-pole units.  
‡ Combinations of switches can be furnished.  
§ AC rated switches are tested for resistive, inductive and tungsten filament loads up to the full current rating and for motor loads up to 80% of the ampere rating.

4C

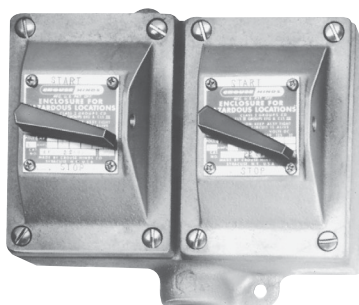
## 4C EDS / EFS Series Control Stations

**Fully Assembled EDS Factory Sealed  
Manual Motor Starting Switches  
and Enclosures**

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG



EDS2199



EDS2229

4C

### Ordering Information

**With Allen-Bradley Bulletin 600 Switches**  
Maximum HP Ratings

| Poles              | 115-230<br>Volts AC | 115-230<br>Volts DC   | Allen-Bradley Switch<br>Cat. # |                                         |
|--------------------|---------------------|-----------------------|--------------------------------|-----------------------------------------|
| 1                  | 1 hp                |                       | A B BUL 600 T0X4               |                                         |
| 2                  | 1 hp                | ¾ hp                  | A B BUL 600 T0X5               |                                         |
| Poles              | Hub<br>Size<br>in.  | Dead<br>End<br>Cat. # | Through<br>Feed<br>Cat. #      | Factory Sealed<br>Replacement<br>Switch |
| <b>Single Gang</b> |                     |                       |                                |                                         |
| 1                  | ¾                   | EDS2199 ①             | EDSC2199 ①                     | SW9                                     |
|                    | 1                   | EDS3199 ①             | EDSC3199 ①                     | SW9                                     |
| 2                  | ¾                   | EDS21100 ①            | EDSC21100 ①                    | SW10                                    |
|                    | 1                   | EDS31100 ①            | EDSC31100 ①                    | SW10                                    |
| <b>Two Gang</b>    |                     |                       |                                |                                         |
| 1                  | ¾                   | EDS2299 ①             | EDSC2299 ①                     | SW9                                     |
|                    | 1                   | EDS3299 ①             | EDSC3299 ①                     | SW9                                     |
| 2                  | ¾                   | EDS22100 ①            | EDSC22100 ①                    | SW10                                    |
|                    | 1                   | EDS32100 ①            | EDSC32100 ①                    | SW10                                    |

### ① Heater Table (Allen Bradley)

| Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number | Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number |
|------------------------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------|
| 0.17                               | P1                                              | 2.40                               | P20                                             |
| 0.21                               | P2                                              | 2.58                               | P21                                             |
| 0.25                               | P3                                              | 2.92                               | P22                                             |
| 0.32                               | P4                                              | 3.09                               | P23                                             |
| 0.39                               | P5                                              | 3.32                               | P24                                             |
| 0.46                               | P6                                              | 3.77                               | P25                                             |
| 0.57                               | P7                                              | 4.16                               | P26                                             |
| 0.71                               | P8                                              | 4.51                               | P27                                             |
| 0.79                               | P9                                              | 4.93                               | P28                                             |
| 0.87                               | P10                                             | 5.43                               | P29                                             |
| 0.98                               | P11                                             | 6.03                               | P30                                             |
| 1.08                               | P12                                             | 6.83                               | P31                                             |
| 1.19                               | P13                                             | 7.72                               | P32                                             |
| 1.30                               | P14                                             | 8.24                               | P33                                             |
| 1.43                               | P15                                             | 8.90                               | P34                                             |
| 1.58                               | P16                                             | 9.60                               | P35                                             |
| 1.75                               | P17                                             | 10.80                              | P36                                             |
| 1.88                               | P18                                             | 12.00                              | P37                                             |
| 2.13                               | P19                                             | 13.50                              | P38                                             |
|                                    |                                                 | 15.20                              | P39                                             |

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted. Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS21101-W5. Insert symbol 0 (zero) to omit heater.

\* Class I, Group B: All units on this page can be modified for Class I, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1½" of each conduit opening in Division 1. In Canada, for Group B applications consult factory.  
① Includes one interchangeable heater. Select from the heater table and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

# EDS / EFS Series Control Stations

## Fully Assembled EDS Factory Sealed Manual Motor Starting Switches and Enclosures

Cl. I, Div. 1 & 2, Groups B\*, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7B\*CD, 9EFG

**4C**

### Ordering Information With General Electric Switches Maximum HP Ratings

| Poles              | 115-230<br>Volts AC | 115<br>Volts DC       | 230<br>Volts DC           | G.E. Switch<br>Cat. #                   |
|--------------------|---------------------|-----------------------|---------------------------|-----------------------------------------|
| 1                  | 1 hp                | 1 hp                  | 1/4 hp                    | CR101 Y                                 |
| 2                  | 1 hp                | 1 hp                  | 1 hp                      | CR101 H                                 |
| Poles              | Hub<br>Size<br>in.  | Dead<br>End<br>Cat. # | Through<br>Feed<br>Cat. # | Factory Sealed<br>Replacement<br>Switch |
| <b>Single Gang</b> |                     |                       |                           |                                         |
| 1                  | 3/4                 | EDS21093 ①            | EDSC21093 ①               | SW11                                    |
|                    | 1                   | EDS31093 ①            | EDSC31093 ①               | SW11                                    |
| 2                  | 3/4                 | EDS21094 ①            | EDSC21094 ①               | SW12                                    |
|                    | 1                   | EDS31094 ①            | EDSC31094 ①               | SW12                                    |
| <b>Two Gang</b>    |                     |                       |                           |                                         |
| 1                  | 3/4                 | EDS22093 ①            | EDSC22093 ①               | SW11                                    |
|                    | 1                   | EDS32093 ①            | EDSC32093 ①               | SW11                                    |
| 2                  | 3/4                 | EDS22094 ①            | EDSC22094 ①               | SW12                                    |
|                    | 1                   | EDS32094 ①            | EDSC32094 ①               | SW12                                    |

### ① Heater Table (General Electric)

| Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number | Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number |
|------------------------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------|
| .48                                | G2                                              | 3.01                               | G22                                             |
| .53                                | G3                                              | 3.27                               | G23                                             |
| .58                                | G4                                              | 3.56                               | G24                                             |
| .65                                | G5                                              | 3.88                               | G25                                             |
| .71                                | G6                                              | 4.22                               | G26                                             |
| .78                                | G7                                              | 4.60                               | G27                                             |
| .86                                | G8                                              | 5.00                               | G28                                             |
| .95                                | G9                                              | 5.43                               | G29                                             |
| 1.04                               | G10                                             | 5.90                               | G30                                             |
| 1.14                               | G11                                             | 6.41                               | G31                                             |
| 1.25                               | G12                                             | 6.98                               | G32                                             |
| 1.37                               | G13                                             | 7.60                               | G33                                             |
| 1.49                               | G14                                             | 8.25                               | G34                                             |
| 1.63                               | G15                                             | 8.95                               | G35                                             |
| 1.78                               | G16                                             | 9.75                               | G36                                             |
| 1.95                               | G17                                             | 10.60                              | G37                                             |
| 2.13                               | G18                                             | 11.40                              | G38                                             |
| 2.32                               | G19                                             | 12.50                              | G39                                             |
| 2.53                               | G20                                             | 13.60                              | G40                                             |
| 2.76                               | G21                                             | 14.80                              | G41                                             |
|                                    |                                                 | 16.00                              | G42                                             |

### Dimensions

see page 526

These heaters are for motors rated 40°C continuously. For motors rated 50°C or 55°C, multiply full load motor current by 0.9 and use this value to select heaters. Symbol 0 (zero) must be used to indicate heater omitted. Includes one interchangeable heater. Select heater from the table below individual listings and use symbol number as second section of the Cat. No. Example: EDS21101-W5. Insert symbol 0 (zero) to omit heater.

\*Class I, Group B: All units on this page can be modified for Class I, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1 1/2" of each conduit opening in Division 1. In Canada, for Group B applications consult factory.

① Includes one interchangeable heater. Select from the heater table and use symbol number as second section of the Cat. No. Example: EDS2199-P5. Insert symbol 0 (zero) to omit heater.

### Ordering Information With Cutler-Hammer Switches Maximum HP Ratings

|             | 120-240            | 32                    | 120                       | 240                                     | Cutler-Hammer |
|-------------|--------------------|-----------------------|---------------------------|-----------------------------------------|---------------|
| Poles       | Volts AC           | Volts DC              | Volts DC                  | Volts DC                                | Switch Cat. # |
| 1           | 1 hp               | ¼ hp                  |                           | ¼ hp                                    | MST01         |
| 2           | 1 hp               | ¼ hp                  | 1 hp                      | 1 hp                                    | MST02         |
| Poles       | Hub<br>Size<br>in. | Dead<br>End<br>Cat. # | Through<br>Feed<br>Cat. # | Factory Sealed<br>Replacement<br>Switch |               |
| Single Gang |                    |                       |                           |                                         |               |
| 1           | ¾                  | EDS21101 ①            | EDSC21101 ①               | SW13                                    |               |
|             | 1                  | EDS31101 ①            | EDSC31101 ①               | SW13                                    |               |
| 2           | ¾                  | EDS21102 ①            | EDSC21102 ①               | SW14                                    |               |
|             | 1                  | EDS31102 ①            | EDSC31102 ①               | SW14                                    |               |
| Two Gang    |                    |                       |                           |                                         |               |
| 1           | ¾                  | EDS22101 ①            | EDSC22101 ①               | SW13                                    |               |
|             | 1                  | EDS32101 ①            | EDSC32101 ①               | SW13                                    |               |
| 2           | ¾                  | EDS22102 ①            | EDSC22102 ①               | SW14                                    |               |
|             | 1                  | EDS32102 ①            | EDSC32102 ①               | SW14                                    |               |

### ① Heater Table (Cutler-Hammer)

| Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number | Max.<br>Motor<br>Full-Load<br>Amps | Eaton's<br>Crouse-<br>Hinds<br>Symbol<br>Number |
|------------------------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------|
| .43                                | W1                                              | 2.95                               | W21                                             |
| .48                                | W2                                              | 3.27                               | W22                                             |
| .53                                | W3                                              | 3.59                               | W23                                             |
| .58                                | W4                                              | 3.99                               | W24                                             |
| .64                                | W5                                              | 4.39                               | W25                                             |
| .71                                | W6                                              | 4.79                               | W26                                             |
| .78                                | W7                                              | 5.26                               | W27                                             |
| .87                                | W8                                              | 5.83                               | W28                                             |
| .95                                | W9                                              | 6.39                               | W29                                             |
| 1.03                               | W10                                             | 7.03                               | W30                                             |
| 1.15                               | W11                                             | 7.74                               | W31                                             |
| 1.27                               | W12                                             | 8.46                               | W32                                             |
| 1.35                               | W13                                             | 9.35                               | W33                                             |
| 1.51                               | W14                                             | 10.30                              | W34                                             |
| 1.67                               | W15                                             | 11.35                              | W35                                             |
| 1.83                               | W16                                             | 12.47                              | W36                                             |
| 1.99                               | W17                                             | 13.67                              | W37                                             |
| 2.23                               | W18                                             | 15.12                              | W38                                             |
| 2.47                               | W19                                             | 16.00                              | W39                                             |
| 2.71                               | W20                                             |                                    |                                                 |

## Crouse-Hinds

by **EATON**

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4C

# 4C EDS / EFS Series Control Stations

## Fully Assembled EFS Fire Alarm Station

Cl. I, Div. 1, Groups B\*, C, D Explosionproof  
 Cl. I, Div. 2, Groups B, C, D Dust-Ignitionproof  
 Cl. II, Div. 1, Groups E, F, G Raintight  
 Cl. II, Div. 2, Groups F, G Wet Locations  
 Cl. III  
 NEMA 3, 7B\*CD, 9EFG

### Applications:

EFS Fire Alarm Stations are used:

- In areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- To indicate at a remote location that a fire exists in the area

### Features:

- Small, compact enclosures with accurately ground flange on both body and cover for flame-tight joint
- Available in red for fire alarm applications

### Certifications and Compliances:

- NEC
  - Class I, Groups B\*, C, D
  - Class II, Groups E, F, G
  - Class III
- NEMA 3, 7B\*CD, 9EFG
- UL Standard: 1203
- As indicated under catalog listings, certain units can be supplied for Class I, Division 1, Group B (NEMA 7B). Seals must be installed within 1 1/2" of each conduit opening.

### Standard Materials:

- Bodies – *Feraloy*® iron alloy (U.S.) and copper-free aluminum (Canada)

### Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized with aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

### Options:

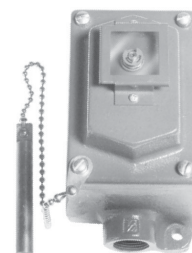
The following special option is available from factory by adding suffix to Cat. #:

#### Description

Where indicated in the catalog listings, units suitable for Class I, Division 1, Group B usage can be supplied.....

#### Suffix

GB\*



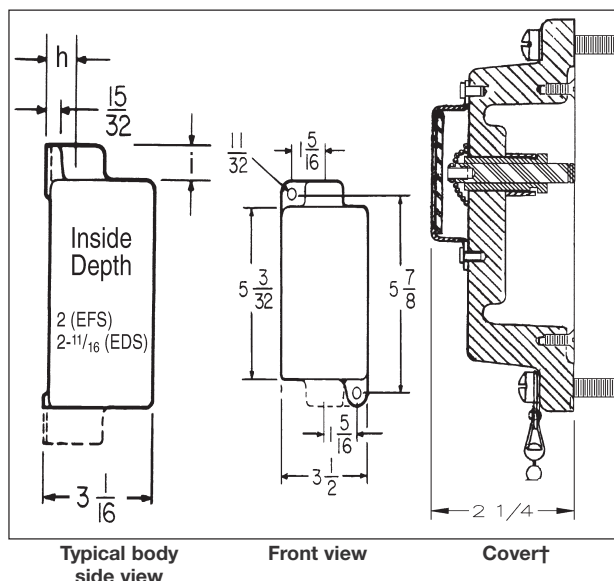
EFS21095

### Ordering Information

| Hub Size | Dead End Cat. # | Through Feed Cat. # |
|----------|-----------------|---------------------|
| 3/4      | EFS21095        | EFSC21095           |

### Dimensions

In Inches:



| Hub Size | Dim. "h" | Dim. "i" |
|----------|----------|----------|
| 1/2      | 3/4      | 13/16    |
| 3/4      | 7/8      | 13/16    |
| 1        | 1        | 13/16    |

Dimensions are approximate, not for construction purposes.

†Surface covers have same length and width dimensions as bodies.

\*Class I, Group B option: Units listed above can be modified for Class I, Division 1, Group B usage. Add suffix GB to the Cat. No. Example: EFS21095-GB. Seals must be installed within 1 1/2" of each conduit opening.

# EDS / EFS Series Control Stations

## Sub-assembly Reference Guide

For a complete list of components for EDS & EFS Control Stations, see page 514 for FlexStation™ Series

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### Control Stations and their Sub-assemblies

| Complete Control Station              | Sub-assembly          |               | Notes and Requirements                                                                                                                                          |
|---------------------------------------|-----------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | Cover & Device        | Cast Back Box |                                                                                                                                                                 |
| PUSHBUTTONS                           |                       |               |                                                                                                                                                                 |
| EDS2184                               | DSD918                | EDS271        |                                                                                                                                                                 |
| EDSC2184                              | DSD918                | EDSC271       |                                                                                                                                                                 |
| EDS215                                | DSD922                | EDS271        | Start/ Stop Legend included                                                                                                                                     |
| EDSC215                               | DSD922                | EDSC271       | Start/ Stop Legend included                                                                                                                                     |
| EDS2190                               | DSD921                | EDS271        |                                                                                                                                                                 |
| EDSC2190                              | DSD921                | EDSC271       |                                                                                                                                                                 |
| EDS2184-S769-EM-SP                    | DSD918-S769-EM-SP     | EDS271        | Emergency Stop Legend included                                                                                                                                  |
| EDSC2184-S769-EM-SP                   | DSD918-S769-EM-SP     | EDSC271       | Emergency Stop Legend included                                                                                                                                  |
| EDS2284                               | (2) DSD918            | EDS272        |                                                                                                                                                                 |
| EDSC2284                              | (2) DSD918            | EDSC272       |                                                                                                                                                                 |
| EDS225                                | (2) DSD922            | EDS272        | Start/ Stop Legend included                                                                                                                                     |
| EDSC225                               | (2) DSD922            | EDSC272       | Start/ Stop Legend included                                                                                                                                     |
| EDS2290                               | (2) DSD921            | EDS272        |                                                                                                                                                                 |
| EDSC2290                              | (2) DSD921            | EDSC272       |                                                                                                                                                                 |
| PILOT LIGHTS                          |                       |               |                                                                                                                                                                 |
| EFS21524-J*                           | DSD948-J*             | EDS271 †      | * Insert pilot light color<br>† When using the EFS Series pilot light in Cl. I, Div. 1, Group B applications, the EFS back box is required in place of the EDS. |
| EFSC21524-J*                          | DSD948-J*             | EDSC271 †     |                                                                                                                                                                 |
| EFS21561-J*-J*                        | DSD947-J*-J*          | EDS271 †      |                                                                                                                                                                 |
| EFSC21561-J*-J*                       | DSD947-J*-J*          | EDSC271 †     |                                                                                                                                                                 |
| PUSHBUTTON / PILOT LIGHT COMBINATIONS |                       |               |                                                                                                                                                                 |
| EDS21473-J*                           | DSD958-J*             | EDS271        | * Insert pilot light color                                                                                                                                      |
| EDSC21473-J*                          | DSD958-J*             | EDSC271       | * Insert pilot light color                                                                                                                                      |
| EDS22471-J*                           | DSD948-J* & DSD921    | EDS272        | * Insert pilot light color                                                                                                                                      |
| EDSC22471-J*                          | DSD948-J* & DSD921    | EDSC272       | * Insert pilot light color                                                                                                                                      |
| EDS22868-J*-J*                        | DSD947-J*-J* & DSD921 | EDS272        | * Insert pilot light color                                                                                                                                      |
| EDSC22868-J*-J*                       | DSD947-J*-J* & DSD921 | EDSC272       | * Insert pilot light color                                                                                                                                      |
| SELECTOR SWITCHES                     |                       |               |                                                                                                                                                                 |
| EDS21271                              | DSD923                | EDS271        |                                                                                                                                                                 |
| EDSC21271                             | DSD923                | EDSC271       |                                                                                                                                                                 |
| EDS21272                              | DSD924                | EDS271        |                                                                                                                                                                 |
| EDSC21272                             | DSD924                | EDSC271       |                                                                                                                                                                 |
| EDS21273                              | DSD925                | EDS271        |                                                                                                                                                                 |
| EDSC21273                             | DSD925                | EDSC271       |                                                                                                                                                                 |
| EDS21274                              | DSD926                | EDS271        |                                                                                                                                                                 |
| EDSC21274                             | DSD926                | EDSC271       |                                                                                                                                                                 |
| EDS21275                              | DSD927                | EDS271        |                                                                                                                                                                 |
| EDSC21275                             | DSD927                | EDSC271       |                                                                                                                                                                 |
| MANUAL MOTOR STARTER WITH O/L         |                       |               |                                                                                                                                                                 |
| EDS21101                              | DS415A & SW13         | EDS271        | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21101                             | DS415A & SW13         | EDSC271       | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21102                              | DS415A & SW14         | EDS271        | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21102                             | DS415A & SW14         | EDSC271       | "-W * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21093                              | DS415A & SW11         | EDS271        | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21093                             | DS415A & SW11         | EDSC271       | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21094                              | DS415A & SW12         | EDS271        | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21094                             | DS415A & SW12         | EDSC271       | "-G * " for heater, or "-0" distributor provided                                                                                                                |
| EDS2199                               | DS415A & SW9          | EDS271        | "-P * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC2199                              | DS415A & SW9          | EDSC271       | "-P * " for heater, or "-0" distributor provided                                                                                                                |
| EDS21100                              | DS415A & SW10         | EDS271        | "-P * " for heater, or "-0" distributor provided                                                                                                                |
| EDSC21100                             | DS415A & SW10         | EDSC271       | "-P * " for heater, or "-0" distributor provided                                                                                                                |



**Sub-assembly  
Reference Guide**

**Control Stations and their Sub-assemblies**

|                          | Sub-assembly            |               |                                     |
|--------------------------|-------------------------|---------------|-------------------------------------|
| Complete Control Station | Cover & Device          | Cast Back Box | Notes and Requirements              |
| MANUAL MOTOR STARTER     |                         |               |                                     |
| EFD218-T8                | DSD916                  | EDS271        |                                     |
| Alternative              | DS415A & SQ D 2510 KO-1 | EDS271        | SQ D switch provided by distributor |
| EFDC218-T8               | DSD916                  | EDSC271       |                                     |
| Alternative              | DS415A & SQ D 2510 KO-1 | EDSC271       | SQ D switch provided by distributor |
| EFD2419                  | DSD917                  | EDS271        |                                     |
| Alternative              | DS415A & GE 2368S       | EDS271        | GE switch provided by distributor   |
| EFDC2419                 | DSD917                  | EDSC271       |                                     |
| Alternative              | DS415A & GE 2368S       | EDSC271       | GE switch provided by distributor   |
| SNAP SWITCHES            |                         |               |                                     |
| EDS2129                  | DS652 & SW5             | EDS271        |                                     |
| Alternative              | DSD933                  | EDS271        | External Sealing Fitting Required   |
| EDSC2129                 | DS652 & SW5             | EDSC271       |                                     |
| Alternative              | DSD933                  | EDSC271       | External Sealing Fitting Required   |
| EDS218                   | DS652 & SW6             | EDS271        |                                     |
| Alternative              | DSD634                  | EDS271        | External Sealing Fitting Required   |
| EDSC218                  | DS652 & SW6             | EDSC271       |                                     |
| Alternative              | DSD634                  | EDSC271       | External Sealing Fitting Required   |
| EDS2130                  | DS652 & SW7             | EDS271        |                                     |
| Alternative              | DSD936                  | EDS271        | External Sealing Fitting Required   |
| EDSC2130                 | DS652 & SW7             | EDSC271       |                                     |
| Alternative              | DSD936                  | EDSC271       | External Sealing Fitting Required   |
| EDS2140                  | DS652 & SW8             | EDS271        |                                     |
| Alternative              | DSD937                  | EDS271        | External Sealing Fitting Required   |
| EDSC2140                 | DS652 & SW8             | EDSC271       |                                     |
| Alternative              | DSD937                  | EDSC271       | External Sealing Fitting Required   |
| EDS2229                  | (2) DS652 & (2) SW5     | EDS272        |                                     |
| Alternative              | (2) DSD933              | EDS272        | External Sealing Fitting Required   |
| EDSC2229                 | (2) DS652 & (2) SW5     | EDSC272       |                                     |
| Alternative              | (2) DSD933              | EDSC272       | External Sealing Fitting Required   |
| EDSC228                  | (2) DS652 & (2) SW6     | EDSC272       |                                     |
| Alternative              | (2) DSD634              | EDSC272       | External Sealing Fitting Required   |
| EDS2230                  | (2) DS652 & (2) SW7     | EDS272        |                                     |
| Alternative              | (2) DSD936              | EDS272        | External Sealing Fitting Required   |
| EDSC2230                 | (2) DS652 & (2) SW7     | EDSC272       |                                     |
| Alternative              | (2) DSD936              | EDSC272       | External Sealing Fitting Required   |
| EDSC2240                 | (2) DS652 & (2) SW8     | EDSC272       |                                     |
| Alternative              | (2) DSD937              | EDSC272       | External Sealing Fitting Required   |
| ROCKER SWITCHES          |                         |               |                                     |
| EDS2596                  | DSD949                  | EDS271        |                                     |
| EDSC2596                 | DSD949                  | EDSC271       |                                     |
| EDS2162                  | DSD951                  | EDS271        | Start/ Stop Legend included         |
| EDSC2162                 | DSD951                  | EDSC271       | Start/ Stop Legend included         |
| EDS2194                  | DSD950                  | EDS271        |                                     |
| EDSC2194                 | DSD950                  | EDSC271       |                                     |
| EDS2696                  | (2) DSD949              | EDS272        | Start/ Stop Legend included         |
| EDSC2696                 | (2) DSD949              | EDSC272       | Start/ Stop Legend included         |
| EDS2262                  | (2) DSD951              | EDS272        |                                     |
| EDSC2262                 | (2) DSD951              | EDSC272       |                                     |
| EDS2294                  | (2) DSD950              | EDS272        |                                     |
| EDSC2294                 | (2) DSD950              | EDSC272       |                                     |

Additional notes:

- See Eaton's Crouse-Hinds' installation instructions for any possible additional sealing requirements.
- Part numbers listed with 3/4" hub in back box (Ex. EDS2184). For 1/2" hub, change the "2" to "1" (EDS1184). For 1" hub, change the "2" to "3" (EDS3184).
- Control Stations with "Stop" legend have lockout provided as standard.
- Pilot Light Colors J"-- J1= Red, J3= Green, J6= Amber, J10= Clear, J11= Blue. LED pilot lights are available with LED suffix.
- Pilot Light Transformers for voltages over 125V. Suffix T2= 240/220 - 110V, T4= 480/440 - 110V, T5= 600/500 - 110V (not available on double pilot cover).
- Standard legend plate markings are available by adding nomenclature after the part number (EDS2184-Run).
- Selector switch nameplate kits available. 2-Pos = "SS2KIT", 3-Pos = "SS3KIT". See Replacement Parts book for additional information.
- Copper-free aluminum bodies and covers available with SA suffix.
- Additional control station options may be found in Section 4C.
- Group B ratings may be achieved by adding the GB suffix or using the EFS back box. See part number instructions for the item required.
- Group B ratings may already be achieved when used in Class I, Division 2 applications. See Certifications and Compliances for item required.
- Additional control station configurations available through the FlexStation Component Series.

MC and MCC Series

NEMA 3, 4  
Watertight

4C

Pushbutton Stations, Selector Switches  
and Pilot Lights  
600 VAC Heavy Duty

Applications:

MC pushbuttons or selector switches are used:

- In conjunction with magnetic starters or contactors for remote control of motors

MC pilot lights are used:

- To visually indicate at a remote point that the desired function is being performed (motor running, etc.)

MC pushbuttons, selector switches or pilot lights are used:

- In damp, wet or corrosive locations such as dairies, meat packing plants, chemical plants and outdoor locations

Features:

- Enclosures are compact in design, and gasketed to meet NEMA/EEMAC 3 or 4 requirements as noted in catalog listings
- Pushbutton stations with side rocker handle are furnished with a lockout arrangement on "STOP" position as standard
- Dead end (MC) or through feed (MCC) hubs - 1/2" and 3/4" sizes - with mounting feet
- Standard lockout on "STOP" and "OFF" button on front operated pushbutton covers
- Standard lockout on selector switch covers. Locks two or three position switch handle in any position.

Certifications and  
Compliances:

- NEMA/EEMAC 3, 4
- UL Standard: 508
- CSA Encl. 3, 4, 5

Standard Materials:

- Bodies - Feraloy® iron alloy
- Cover with side rocker handle - copper-free aluminum
- Front pushbutton, selector switch and pilot light covers - Feraloy iron alloy
- Rocker handle and pushbutton guards - type 6 / 6 nylon
- Selector switch handle - copper-free aluminum
- Operating shafts - stainless steel

Standard Finishes:

- Feraloy iron alloy - electrogalvanized and aluminum acrylic paint
- Copper-free aluminum - natural
- Type 6 / 6 nylon - black
- Stainless steel - natural

Options:

The following special options are available by adding suffix to Cat. #:

Description

Suffix

Lockout provision on front operated pushbutton (standard on buttons marked "OFF" and "STOP").....

S153

Neoprene covers for front operated pushbuttons. Meets NEMA 4 requirements and prevents accumulation of dirt around operating shafts.....

S323

Three-position selector switches with modified operation:

    Momentary contact clockwise operation, spring return to center, maintained contact counter-clockwise operation.....

S634

    Momentary contact counter-clockwise operation, spring return to center, maintained contact clockwise operation.....

S635

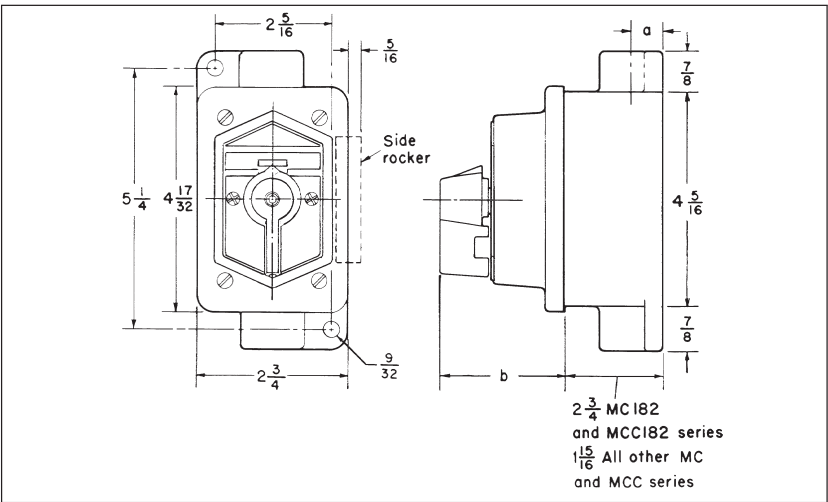
Multiple gang bodies. Two gang, two gang tandem and three, four or five gang bodies can be supplied with combinations of single gang devices.....

Specify  
LED

LED pilot lights in place of standard incandescent pilot lamps.....

Dimensions

In Inches\*:



| Hub size | a   | Type of Cover      | b      |
|----------|-----|--------------------|--------|
| 1/2      | 5/8 | Side Rocker Handle | 1 1/2  |
| 3/4      | 3/4 | Front Pushbutton   | 2 3/8  |
|          |     | Selector Switch    | 2 3/8  |
|          |     | Pilot Light        | 1 1/16 |

\*Dimensions are approximate, not for construction purposes.

Pushbutton Stations, Selector Switches  
and Pilot Lights  
600 VAC Heavy DutyMC dead end  
side rocker handleMCC through feed  
side rocker handleMC dead end  
front pushbuttonMCC through feed  
front pushbutton

## Ordering Information - With Side Rocker Handles

Watertight, NEMA 3, 4

| Normal Positions                      | Marking   | Diagram | Replacement Contact Blocks‡ | Enclosure with Rocker Handles |                          |                            |
|---------------------------------------|-----------|---------|-----------------------------|-------------------------------|--------------------------|----------------------------|
|                                       |           |         |                             | Hub Size                      | Dead End Cat. #          | Through Feed Cat. #        |
| 1 Circuit Universal                   | Specify   |         | ED11                        | 1/2<br>3/4                    | MC1810U1 ①<br>MC2810U1 ① | MCC1810U1 ①<br>MCC2810U1 ① |
| 2 Circuits Universal                  | Specify   |         | ED12                        | 1/2<br>3/4                    | MC1810U ①<br>MC2810U ①   | MCC1810U ①<br>MCC2810U ①   |
| START-STOP unless otherwise specified |           |         |                             |                               |                          |                            |
| 2 Circuits                            |           |         |                             |                               |                          |                            |
| 1 Open - A                            | otherwise |         | ED12*                       | 1/2<br>3/4                    | MC1810 ①<br>MC2810 ①     | MCC1810 ①<br>MCC2810 ①     |
| 1 Closed - B                          | specified |         |                             |                               |                          |                            |

## Ordering Information - With Front Pushbuttons

Weather Resistant, NEMA 3 §

| Normal Positions                      | Marking   | Diagram | Replacement Contact Blocks‡ | Enclosure with Pushbuttons |                          |                            |
|---------------------------------------|-----------|---------|-----------------------------|----------------------------|--------------------------|----------------------------|
|                                       |           |         |                             | Hub Size                   | Dead End Cat. #          | Through Feed Cat. #        |
| 1 Circuit Universal                   | Specify   |         | ED11                        | 1/2<br>3/4                 | MC1910U1 ①<br>MC2910U1 ① | MCC1910U1 ①<br>MCC2910U1 ① |
| 2 Circuits Universal                  | Specify   |         | ED12                        | 1/2<br>3/4                 | MC1910U ①<br>MC2910U ①   | MCC1910U ①<br>MCC2910U ①   |
| START-STOP unless otherwise specified |           |         |                             |                            |                          |                            |
| 2 Circuits                            |           |         |                             |                            |                          |                            |
| 1 Open - A                            | otherwise |         | ED12*                       | 1/2<br>3/4                 | MC1910 ①<br>MC2910 ①     | MCC1910 ①<br>MCC2910 ①     |
| 1 Closed - B                          | specified |         |                             |                            |                          |                            |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

\*Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

§ For Watertight NEMA 4 rating, use suffix S323 (Neoprene button covers). See Options section.

‡For replacement pushbuttons see page 571.

## Pushbutton Stations, Selector Switches and Pilot Lights 600 VAC Heavy Duty



MC dead end  
selector switch

### Ordering Information - Selector Switches

Furnished with pushbutton contact blocks, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below.

| Maintained Contact             |            |            |            | Enclosure with Selector Switch |          |                 |                     |
|--------------------------------|------------|------------|------------|--------------------------------|----------|-----------------|---------------------|
| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks*    | Hub Size | Dead End Cat. # | Through Feed Cat. # |
| Two-Position, Two-Circuit      | A1         |            |            | ED11                           | 1/2      | MC11271 ①       | MCC11271 ①          |
|                                | A2         |            |            |                                | 3/4      | MC21271 ①       | MCC21271 ①          |
| Two-Position, Four-Circuit     | A1         |            |            | ED12                           | 1/2      | MC11272 ①       | MCC11272 ①          |
|                                | A2         |            |            |                                | 3/4      | MC21272 ①       | MCC21272 ①          |
|                                | B1         |            |            |                                |          |                 |                     |
|                                | B2         |            |            |                                |          |                 |                     |
| Three-Position, Two-Circuit †  | A1         |            |            | ED11                           | 1/2      | MC11273 ①       | MCC11273 ①          |
|                                | A2         |            |            |                                | 3/4      | MC21273 ①       | MCC21273 ①          |
|                                | A3         |            |            |                                |          |                 |                     |
|                                | A4         |            |            |                                |          |                 |                     |
| Three-Position, Four-Circuit † | A1         |            |            | ED12                           | 1/2      | MC11274 ①       | MCC11274 ①          |
|                                | A2         |            |            |                                | 3/4      | MC21274 ①       | MCC21274 ①          |
|                                | A3         |            |            |                                |          |                 |                     |
|                                | A4         |            |            |                                |          |                 |                     |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |



MC dead end  
pilot light

### Ordering Information - Pilot Lights‡

| Enclosure with Jewel Cover and Lamp |              |            |          |                 |                     |
|-------------------------------------|--------------|------------|----------|-----------------|---------------------|
| Primary Voltage Range               | Lamp Base    | Lamp Watts | Hub Size | Dead End Cat. # | Through Feed Cat. # |
| 110-125                             | Candelabra   | 6          | 1/2      | MC180 J1        | MCC180 J1           |
| 110-125                             | Candelabra   | 6          | 3/4      | MC-280-J1       | MCC280 J1           |
| 220-250                             | Intermediate | 10         | 1/2      | MC184 J1        | MCC184 J1           |
| 220-250                             | Intermediate | 10         | 3/4      | MC-284-J1       | MCC284 J1           |
| 440-480                             | Candelabra   | 6          | 1/2      | MC182 J1        | MCC182 J1           |
| 440-480                             | Candelabra   | 6          | 3/4      | MC282 J1        | MCC282 J1           |

\* For replacement contact blocks see page 571.

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

‡ LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED after color symbol (J1).

# N2S and N2SC Series Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

## Applications:

N2S and N2SC pushbutton stations, selector switches and pilot lights are suitable for use:

- In Class I, Groups B, C, D; Division 2 hazardous areas where flammable vapors or gases may be present due to accidental or abnormal operation
- In damp, wet, or corrosive locations
- Indoors or outdoors in Division 2 areas of petroleum refineries, chemical plants and other process industry facilities where similar hazards exist

N2S and N2SC pushbutton stations and selector switches are used:

- In conjunction with magnetic starters or contactors for remote control of motors
- N2S and N2SC pilot lights are used:
- To visually indicate at a remote location that the desired function is being performed

Optional maintained stop pushbutton(s) are used: As emergency or normal stop button(s) in motor control circuits for positive shutdown.

## Features:

- Pushbutton stations, pilot lights, and selector switch devices are factory sealed. External seals are not required.
- Enclosures are made of Krydon® fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat and sunlight.
- Optional maintained stop feature operates by depressing the mushroom head pushbutton. Pushbutton must be manually pulled before start button can be actuated.
- Lockout is standard on selector switch devices.
- Factory installed dead end (N2S) or through feed (N2SC) hubs – 1/2", 3/4", and 1" sizes.
- Indicating plates are available with a choice of 40 standard markings.
- Grounding plate included with each hub.

## Certifications and Compliances:

- NEC:
  - Class I, Division 2, Groups B, C & D
- NEMA: 3, 4X, 7BCD (Division 2) and 12
- UL Standard: 1203
- CSA Standard: C22.2 Nos. 14 & 30

## Electrical Rating Ranges:

- Pushbutton stations and selector switches – heavy duty 600 VAC maximum
- Pilot lights – 120 to 600 VAC



## Options:

The following special options are available from factory by adding suffix to Cat. #:

### Description

Padlock attachments for all pushbuttons. For "START-STOP" stations, only "STOP" button provided with lockout (lockout standard with STOP)..... **S708**

### Three position selector switches with modified operation:

Momentary contact clockwise operation, spring return to center, maintained contact counterclockwise operation ..... **S634**

Momentary contact counterclockwise operation, spring return to center, maintained contact clockwise operation ..... **S635**

### Control station with maintained stop pushbutton (requires NCD type enclosure):

One maintained stop pushbutton ..... **MSR1**

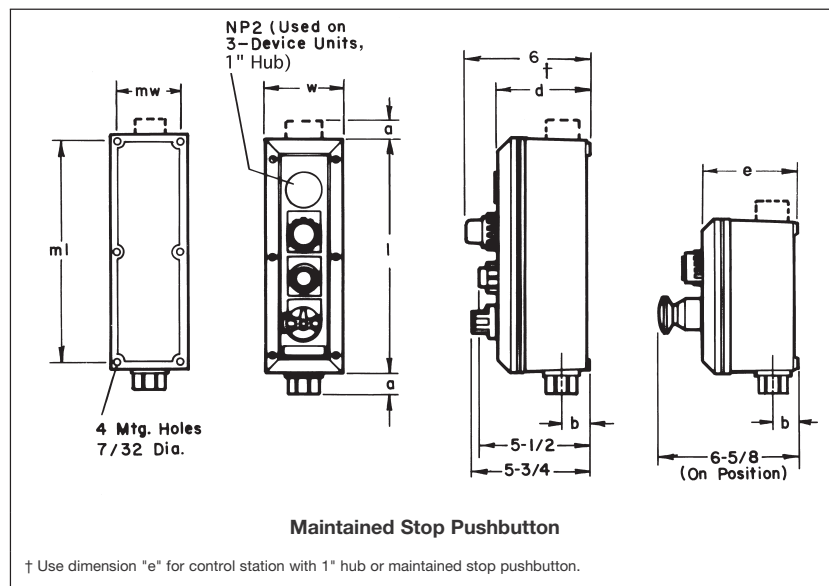
Two maintained stop pushbuttons ..... **MSR2**

Maintained stop pushbuttons are installed at bottom position(s) of control station unless otherwise specified.

LED pilot lights in place of standard incandescent pilot lamps ..... **LED**

## Dimensions

### In Inches:



Dimensions are approximate, not for construction purposes.

| N2S(C)<br>Body<br>Style | Outside<br>Dims.<br>l | w       | (NCS)*<br>d | (NCD)*<br>e | Mounting<br>Dims.<br>ml | mw      | 1/2" & 3/4"<br>Hubs<br>a b | 1"<br>Hubs<br>a b |
|-------------------------|-----------------------|---------|-------------|-------------|-------------------------|---------|----------------------------|-------------------|
| 1 or 2<br>devices       | 7 1/4                 | 3 13/16 | 4 3/8       | 5 3/8       | 6 3/8                   | 2 15/16 | 1 1/8 1 1/16               | 1 1/4 1 5/16      |
| 3 or 4<br>devices       | 11 1/4                | 3 13/16 | 4 3/8       | 5 3/8       | 10 7/8                  | 2 15/16 | 1 1/8 1 1/16               | 1 1/4 1 5/16      |

\*NCS box is supplied with units using 1/2" and 3/4" hubs. NCD box is supplied with units using 1" hubs or MSR option.

‡ NCD 4 device box used with 1" hubs or MSR option.

**Crouse-Hinds**  
by **Eaton**

# N2S and N2SC Series Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

4C

## Ordering Information - With Pilot Lights†\*

| No.<br>Units | Diagram | Volts | Enclosure with Pilot Lights<br>1/2" Hubs |                        | 3/4" Hubs          |                        | 1" Hubs            |                        |
|--------------|---------|-------|------------------------------------------|------------------------|--------------------|------------------------|--------------------|------------------------|
|              |         |       | Dead End<br>Cat. #                       | Through<br>Feed Cat. # | Dead End<br>Cat. # | Through<br>Feed Cat. # | Dead End<br>Cat. # | Through<br>Feed Cat. # |
| 1            |         | 120   | N2S1131 ①                                | N2SC1131 ①             | N2S2131 ①          | N2SC2131 ①             | N2S3131 ①          | N2SC3131 ①             |
|              |         | 240   | N2S1132 ①                                | N2SC1132 ①             | N2S2132 ①          | N2SC2132 ①             | N2S3132 ①          | N2SC3132 ①             |
|              |         | 480   | N2S1134 ①                                | N2SC1134 ①             | N2S2134 ①          | N2SC2134 ①             | N2S3134 ①          | N2SC3134 ①             |
|              |         | 600   | N2S1135 ①                                | N2SC1135 ①             | N2S2135 ①          | N2SC2135 ①             | N2S3135 ①          | N2SC3135 ①             |
| 2            |         | 120   | N2S1231 ①                                | N2SC1231 ①             | N2S2231 ①          | N2SC2231 ①             | N2S3231 ①          | N2SC3231 ①             |
|              |         | 240   | N2S1232 ①                                | N2SC1232 ①             | N2S2232 ①          | N2SC2232 ①             | N2S3232 ①          | N2SC3232 ①             |
|              |         | 480   | N2S1234 ①                                | N2SC1234 ①             | N2S2234 ①          | N2SC2234 ①             | N2S3234 ①          | N2SC3234 ①             |
|              |         | 600   | N2S1235 ①                                | N2SC1235 ①             | N2S2235 ①          | N2SC2235 ①             | N2S3235 ①          | N2SC3235 ①             |
| 3            |         | 120   | N2S1331 ①                                | N2SC1331 ①             | N2S2331 ①          | N2SC2331 ①             | N2S3331 ①          | N2SC3331 ①             |
|              |         | 240   | N2S1332 ①                                | N2SC1332 ①             | N2S2332 ①          | N2SC2332 ①             | N2S3332 ①          | N2SC3332 ①             |
|              |         | 480   | N2S1334 ①                                | N2SC1334 ①             | N2S2334 ①          | N2SC2334 ①             | N2S3334 ①          | N2SC3334 ①             |
|              |         | 600   | N2S1335 ①                                | N2SC1335 ①             | N2S2335 ①          | N2SC2335 ①             | N2S3335 ①          | N2SC3335 ①             |
| 4            |         | 120   | N2S1431 ①                                | N2SC1431 ①             | N2S2431 ①          | N2SC2431 ①             | N2S3431 ①          | N2SC3431 ①             |
|              |         | 240   | N2S1432 ①                                | N2SC1432 ①             | N2S2432 ①          | N2SC2432 ①             | N2S3432 ①          | N2SC3432 ①             |
|              |         | 480   | N2S1434 ①                                | N2SC1434 ①             | N2S2434 ①          | N2SC2434 ①             | N2S3434 ①          | N2SC3434 ①             |
|              |         | 600   | N2S1435 ①                                | N2SC1435 ①             | N2S2435 ①          | N2SC2435 ①             | N2S3435 ①          | N2SC3435 ①             |

## Ordering Information - With Selector Switches

| Style                             | Switch Position |   |   | Marking<br>Unless<br>Otherwise<br>Specified | Enclosure With Selector Switch |                    |                        |
|-----------------------------------|-----------------|---|---|---------------------------------------------|--------------------------------|--------------------|------------------------|
|                                   | 1               | 2 | 3 |                                             | Hub<br>Size                    | Dead End<br>Cat. # | Through Feed<br>Cat. # |
| Two-Position,<br>Two-Circuit      | A1              |   |   | START-STOP<br>(or Specify)                  | 1/2                            | N2S1121 ②          | N2SC1121 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2121 ②          | N2SC2121 ②             |
| Two-Position,<br>Four-Circuit     | A1              |   |   | START-STOP<br>(or Specify)                  | 1/2                            | N2S1122 ②          | N2SC1122 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2122 ②          | N2SC2122 ②             |
| Three-Position,<br>Two-Circuit †  | A1              |   |   | Specify                                     | 1/2                            | N2S1123 ②          | N2SC1123 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2123 ②          | N2SC2123 ②             |
| Three-Position,<br>Four-Circuit † | A1              |   |   | Specify                                     | 1/2                            | N2S1124 ②          | N2SC1124 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2124 ②          | N2SC2124 ②             |
| Three-Position,<br>Four-Circuit † | A1              |   |   | Specify                                     | 1/2                            | N2S1125 ②          | N2SC1125 ②             |
|                                   | A2              |   |   |                                             | 3/4                            | N2S2125 ②          | N2SC2125 ②             |

① Specify lens color for each pilot light. As an example, N2S1231 with one red and one green would be ordered as N2S1231-J1-J3.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Marking

|              |         |                                   |                                     |
|--------------|---------|-----------------------------------|-------------------------------------|
| Pushbuttons: | REVERSE | Selector Switches – Two-Position: | Selector Switches – Three-Position: |
| START        | OPEN    | RUN-JOG                           | RUN-OFF-JOG                         |
| STOP         | CLOSE   | HAND-AUTO                         | HAND-OFF-AUTO                       |
| ON           | UP      | FOR-REV                           | FOR-OFF-REV                         |
| OFF          | DOWN    | FAST-SLOW                         | FAST-OFF-SLOW                       |
| RUN          | IN      | OPEN-CLOSE                        | 1-OFF-2                             |
| JOG          | OUT     | UP-DOWN                           | OPEN-OFF-CLOSE                      |
| TRIP         | RAISE   | ON-OFF                            | UP-OFF-DOWN                         |
| RESET        | LOWER   | IN-OUT                            |                                     |
| TEST         |         | RAISE-LOWER                       |                                     |
| LIGHT ON     |         | START-STOP                        |                                     |
| HAND         |         |                                   |                                     |
| AUTOMATIC    |         |                                   |                                     |
| EMERGENCY    |         |                                   |                                     |
| FORWARD      |         |                                   |                                     |

† Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

\* LED pilot lights are available. Add suffix LED after last color symbol. See Options Sections for more information.

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

## Crouse-Hinds

by **E.T.N**

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545



4C

# N2S and N2SC Series Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

## Ordering Information - With Pushbuttons – Momentary Contact

| No. Units | Contact Symbol                                                                                                                                                                                                                                                                                                                          | Marking Unless Otherwise Specified | Enclosure with Pushbuttons |                 |                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------|-----------------|---------------------|
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | Hub Size                   | Dead End Cat. # | Through Feed Cat. # |
| 1         |                                                                                                                                                                                                                                                        | START<br>(or Specify)              | 1/2                        | N2S1110 ②       | N2SC1110 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2110 ②       | N2SC2110 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3110 ②       | N2SC3110 ②          |
| 2         |                                                                                                                                                                       | START-STOP<br>(or Specify)         | 1/2                        | N2S1210 ②       | N2SC1210 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2210 ②       | N2SC2210 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3210 ②       | N2SC3210 ②          |
| 3         |                                                                                      | Specify                            | 1/2                        | N2S1310 ②       | N2SC1310 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2310 ②       | N2SC2310 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3310 ②       | N2SC3310 ②          |
| 4         |     | Specify                            | 1/2                        | N2S1410 ②       | N2SC1410 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 3/4                        | N2S2410 ②       | N2SC2410 ②          |
|           |                                                                                                                                                                                                                                                                                                                                         |                                    | 1                          | N2S3410 ②       | N2SC3410 ②          |

## Ordering Information - Combination Control Stations

### Enclosure With Pushbuttons and Pilot Lights

| Pilot Lights* | Pushbuttons | Diagram                                                                                                                                                                 | Markings | Hub Size | Volts | Dead End Cat. # | Through Feed Cat. # | Volts | Dead End Cat. # | Through Feed Cat. # |
|---------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------|-----------------|---------------------|-------|-----------------|---------------------|
| 1             | 1           |                                                                                        | Specify  | 1/2      | 120   | N2S12411 ①②     | N2SC12411 ①②        | 480   | N2S12414 ①②     | N2SC12414 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S22411 ①②     | N2SC22411 ①②        |       | N2S22414 ①②     | N2SC22414 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S32411 ①②     | N2SC32411 ①②        |       | N2S32414 ①②     | N2SC32414 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S12412 ①②     | N2SC12412 ①②        | 600   | N2S12415 ①②     | N2SC12415 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S22412 ①②     | N2SC22412 ①②        |       | N2S22415 ①②     | N2SC22415 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S32412 ①②     | N2SC32412 ①②        |       | N2S32415 ①②     | N2SC32415 ①②        |
| 1             | 2           |                                                                                      | Specify  | 1/2      | 120   | N2S13421 ①②     | N2SC13421 ①②        | 480   | N2S13424 ①②     | N2SC13424 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S23421 ①②     | N2SC23421 ①②        |       | N2S23424 ①②     | N2SC23424 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S33421 ①②     | N2SC33421 ①②        |       | N2S33424 ①②     | N2SC33424 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S13422 ①②     | N2SC13422 ①②        | 600   | N2S13425 ①②     | N2SC13425 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S23422 ①②     | N2SC23422 ①②        |       | N2S23425 ①②     | N2SC23425 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S33422 ①②     | N2SC33422 ①②        |       | N2S33425 ①②     | N2SC33425 ①②        |
| 2             | 1           |   | Specify  | 1/2      | 120   | N2S13411 ①②     | N2SC13411 ①②        | 480   | N2S13414 ①②     | N2SC13414 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S23411 ①②     | N2SC23411 ①②        |       | N2S23414 ①②     | N2SC23414 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S33411 ①②     | N2SC33411 ①②        |       | N2S33414 ①②     | N2SC33414 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S13412 ①②     | N2SC13412 ①②        | 600   | N2S13415 ①②     | N2SC13415 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S23412 ①②     | N2SC23412 ①②        |       | N2S23415 ①②     | N2SC23415 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S33412 ①②     | N2SC33412 ①②        |       | N2S33415 ①②     | N2SC33415 ①②        |
| 2             | 2           |   | Specify  | 1/2      | 120   | N2S14421 ①②     | N2SC14421 ①②        | 480   | N2S14424 ①②     | N2SC14424 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S24421 ①②     | N2SC24421 ①②        |       | N2S24424 ①②     | N2SC24424 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S34421 ①②     | N2SC34421 ①②        |       | N2S34424 ①②     | N2SC34424 ①②        |
|               |             |                                                                                      | Specify  | 1/2      | 240   | N2S14422 ①②     | N2SC14422 ①②        | 600   | N2S14425 ①②     | N2SC14425 ①②        |
|               |             |                                                                                                                                                                         |          | 3/4      |       | N2S24422 ①②     | N2SC24422 ①②        |       | N2S24425 ①②     | N2SC24425 ①②        |
|               |             |                                                                                                                                                                         |          | 1        |       | N2S34422 ①②     | N2SC34422 ①②        |       | N2S34425 ①②     | N2SC34425 ①②        |

① See pages 545–547

② See pages 545–547

‡ Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.



# N2S and N2SC Series Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

4C

## Ordering Information - Combination Control Stations

|                                                                                   |                                                                                   | Selector Switches Position No.† |                                                                                   |    | Enclosure With Pilot Light, Pushbuttons and Selector Switch                       |          |       |                 |                     |       |                 |                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|----------|-------|-----------------|---------------------|-------|-----------------|---------------------|
| Pilot Lights*‡                                                                    | Push buttons                                                                      | 1                               | 2                                                                                 | 3  | Markings                                                                          | Hub Size | Volts | Dead End Cat. # | Through Feed Cat. # | Volts | Dead End Cat. # | Through Feed Cat. # |
| 1                                                                                 | 2                                                                                 | 2-Pos, 2-Cct                    |                                                                                   |    |                                                                                   | 1/2      |       | N2S145211 ①②    | N2SC145211 ①②       |       | N2S145214 ①②    | N2SC145214 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 3/4      | 120   | N2S245211 ①②    | N2SC245211 ①②       | 480   | N2S245214 ①②    | N2SC245214 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 1        |       | N2S345211 ①②    | N2SC345211 ①②       |       | N2S345214 ①②    | N2SC345214 ①②       |
|  |  | A1                              |  | A2 |  | Specify  | 1/2   | N2S145212 ①②    | N2SC145212 ①②       |       | N2S145215 ①②    | N2SC145215 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 3/4      | 240   | N2S245212 ①②    | N2SC245212 ①②       | 600   | N2S245215 ①②    | N2SC245215 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 1        |       | N2S345212 ①②    | N2SC345212 ①②       |       | N2S345215 ①②    | N2SC345215 ①②       |
| 1                                                                                 | 2                                                                                 | 3-Pos, 2-Cct                    |                                                                                   |    |                                                                                   | 1/2      |       | N2S145231 ①②    | N2SC145231 ①②       |       | N2S145234 ①②    | N2SC145234 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 3/4      | 120   | N2S245231 ①②    | N2SC245231 ①②       | 480   | N2S245234 ①②    | N2SC245234 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 1        |       | N2S345231 ①②    | N2SC345231 ①②       |       | N2S345234 ①②    | N2SC345234 ①②       |
|  |  | A1                              |  | A2 |  | Specify  | 1/2   | N2S145232 ①②    | N2SC145232 ①②       |       | N2S145235 ①②    | N2SC145235 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 3/4      | 240   | N2S245232 ①②    | N2SC245232 ①②       | 600   | N2S245235 ①②    | N2SC245235 ①②       |
|                                                                                   |                                                                                   |                                 |                                                                                   |    |                                                                                   | 1        |       | N2S345232 ①②    | N2SC345232 ①②       |       | N2S345235 ①②    | N2SC345235 ①②       |

① Specify lens color for each pilot light. As an example, N2S1231 with one red and one green would be ordered as N2S1231-J1-J3.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

| Marking      |         |                                   |                                     |
|--------------|---------|-----------------------------------|-------------------------------------|
| Pushbuttons: | REVERSE | Selector Switches – Two-Position: | Selector Switches – Three-Position: |
| START        | OPEN    |                                   |                                     |
| STOP         | CLOSE   | RUN-JOG                           | RUN-OFF-JOG                         |
| ON           | UP      | HAND-AUTO                         | HAND-OFF-AUTO                       |
| OFF          | DOWN    | FOR-REV                           | FOR-OFF-REV                         |
| RUN          | IN      | FAST-SLOW                         | FAST-OFF-SLOW                       |
| JOG          | OUT     | OPEN-CLOSE                        | 1-OFF-2                             |
| TRIP         | RAISE   | UP-DOWN                           | OPEN-OFF-CLOSE                      |
| RESET        | LOWER   | ON-OFF                            | UP-OFF-DOWN                         |
| TEST         |         | IN-OUT                            |                                     |
| LIGHT ON     |         | RAISE-LOWER                       |                                     |
| HAND         |         | START-STOP                        |                                     |
| AUTOMATIC    |         |                                   |                                     |
| EMERGENCY    |         |                                   |                                     |
| FORWARD      |         |                                   |                                     |

‡ Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

\* LED pilot lights are available. Add suffix LED after last color symbol. See Options Sections for more information.

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

Crouse-Hinds

by E.T.N

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4C

## N2S and N2SC Series Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

### Ordering Information - Custom-Built, Factory Assembled Control Stations

To order your custom-built factory assembled control station, select the enclosure required and add the desired devices from listings below.

Custom-built factory assembled control stations may thus be ordered as follows:

#### Requirements:

3-device control station on *Krydon*® material enclosure with 3/4" through feed hubs, with 1 pilot light with green jewel, rated at 120V; 1 three position, two circuit selector switch marked HAND-OFF-AUTO; and 1 green single circuit pushbutton marked START.

#### ORDER:

NCDC23FA

N2P310-J3

N2SW11311-HAND-OFF-AUTO

N2PS1111G-START

Pilot light jewel symbol, pushbutton and selector switch plate markings are selected from footnote tables. Suffix FA indicates factory assembled.

Note that order of assembly of control stations should be listed in desired mounting order, reading from top to bottom of enclosure.

### Enclosures (NCD or NCDC enclosures must be used with MSR1 or MSR2)

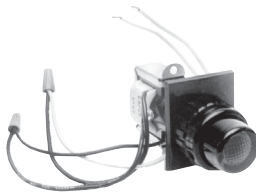
| No. of Devices | Without Hubs<br>Cat. # | With One Hub 1/2"<br>Cat. # | With Two Hub 1/2"<br>Cat. # | With One Hub 3/4"<br>Cat. # | With Two Hub 3/4"<br>Cat. # | With One Hub 1"<br>Cat. # | With Two Hub 1"<br>Cat. # |
|----------------|------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------|---------------------------|
| 1              | NCD01                  | NCD11                       | NCDC11                      | NCD21                       | NCDC21                      | NCD31                     | NCDC31                    |
| 2              | NCD02                  | NCD12                       | NCDC12                      | NCD22                       | NCDC22                      | NCD32                     | NCDC32                    |
| 3              | NCD03                  | NCD13                       | NCDC13                      | NCD23                       | NCDC23                      | NCD33                     | NCDC33                    |
| 4              | NCD04                  | NCD14                       | NCDC14                      | NCD24                       | NCDC24                      | NCD34                     | NCDC34                    |

| No. of Devices | Without Hubs<br>Cat. # | With One Hub (3/4")<br>Cat. # | With Two Hub (3/4")<br>Cat. # | With One Hub (1/2")<br>Cat. # | With Two Hub (1/2")<br>Cat. # |
|----------------|------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1              | NCS01                  | NCS21                         | NCSC21                        | NCS11                         | NCSC11                        |
| 2              | NCS02                  | NCS22                         | NCSC22                        | NCS12                         | NCSC12                        |
| 3              | NCS03                  | NCS23                         | NCSC23                        | NCS13                         | NCSC13                        |
| 4              | NCS04                  | NCS24                         | NCSC24                        | NCS14                         | NCSC14                        |

### Pilot Lights†\* Transformer Type

| Volts | Cat. #   |
|-------|----------|
| 120   | N2PL10 ① |
| 240   | N2PL20 ① |
| 480   | N2PL40 ① |
| 600   | N2PL50 ① |



### Pilot lights to be used in N2SU Series:

|       |                 |
|-------|-----------------|
| Red   | N2PLU10 J1 LED  |
| Green | N2PLU10 J3 LED  |
| Amber | N2PLU10 J6 LED  |
| Clear | N2PLU10 J10 LED |
| Blue  | N2PLU10 J11 LED |

① Specify lens color for each pilot light using symbols below.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

† Pilot lights are transformer type except those rated 120 volts. Lamp type is 120MB, 120 volts, 3 watts.

\* LED pilot lights are available. Add suffix LED after last color symbol. See Options Sections for more information.

N2S and N2SC Series  
Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

4C

Pushbutton Stations – Momentary Contact

| Color of Operator | 1 Circuit      |                  | 2 Circuit      |                  |
|-------------------|----------------|------------------|----------------|------------------|
|                   | Contact Symbol | Universal Cat. # | Contact Symbol | Universal Cat. # |
| Natural           |                | N2PS1111 ②       |                | N2PS1211 ②       |
| Red               |                | N2PS1111R ②      |                | N2PS1211R ②      |
| Green             |                | N2PS1111G ②      |                | N2PS1211G ②      |
| Red Mushroom Head |                | N2PM1111 S111 ②  |                |                  |



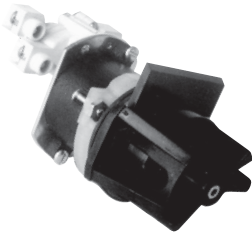
Closure Plug



| Description  | Cat. # |
|--------------|--------|
| Closure Plug | NP2    |

Selector Switches

| Style                            | Position 1 | Position 2 | Position 3 | Cat. #      |
|----------------------------------|------------|------------|------------|-------------|
| Two Position<br>Two Circuit      | A1         |            |            | N2SW11211 ② |
|                                  | A2         |            |            |             |
| Two Position<br>Four Circuit     | A1         |            |            | N2SW12221 ② |
|                                  | A2         |            |            |             |
|                                  | B1         |            |            |             |
|                                  | B2         |            |            |             |
| Three Position<br>Two Circuit †  | A1         |            |            | N2SW11311 ② |
|                                  | A2         |            |            |             |
| Three Position<br>Four Circuit † | A1         |            |            | N2SW12321 ② |
|                                  | A2         |            |            |             |
|                                  | B1         |            |            |             |
|                                  | B2         |            |            |             |
| Three Position<br>Four Circuit † | A1         |            |            | N2SW12322 ② |
|                                  | A2         |            |            |             |
|                                  | B1         |            |            |             |
|                                  | B2         |            |            |             |



② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

Marking

|              |         |                     |                     |
|--------------|---------|---------------------|---------------------|
| Pushbuttons: | REVERSE | Selector Switches – | Selector Switches – |
| START        | OPEN    | Two-Positions:      | Three-Position:     |
| STOP         | CLOSE   | RUN-JOG             | RUN-OFF-JOG         |
| ON           | UP      | HAND-AUTO           | HAND-OFF-AUTO       |
| OFF          | DOWN    | FOR-REV             | FOR-OFF-REV         |
| RUN          | IN      | FAST-SLOW           | FAST-OFF-SLOW       |
| JOG          | OUT     | OPEN-CLOSE          | 1-OFF-2             |
| TRIP         | RAISE   | UP-DOWN             | OPEN-OFF-CLOSE      |
| RESET        | LOWER   | ON-OFF              | UP-OFF-DOWN         |
| TEST         |         | IN-OUT              |                     |
| LIGHT ON     |         | RAISE-LOWER         |                     |
| HAND         |         | START-STOP          |                     |
| AUTOMATIC    |         |                     |                     |
| EMERGENCY    |         |                     |                     |
| FORWARD      |         |                     |                     |

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

4C

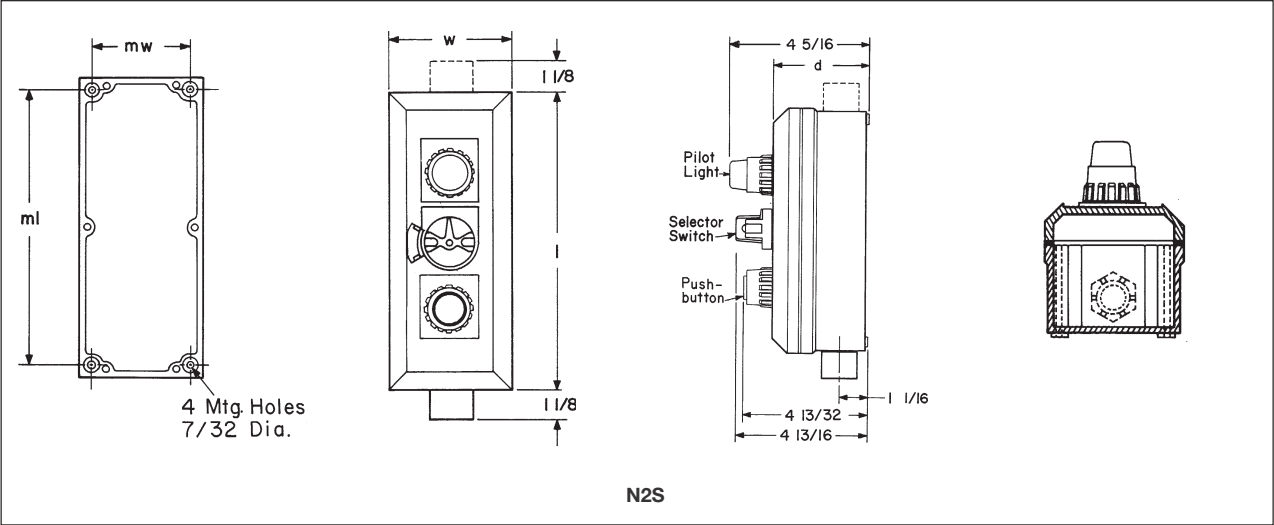
4C

N2S and N2SC Series  
Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 4X, 7BCD (Div. 2), 12  
Watertight  
Weatherproof  
Dust-tight

Dimensions  
In Inches:



For 1/2" and 3/4" hub sizes (for 1" hub and/or MSR option, see page 544).

| NCS(C) Body Style | Outside Dimensions |         |       | Mounting Dimensions |         |
|-------------------|--------------------|---------|-------|---------------------|---------|
|                   | l                  | w       | d     | ml                  | mw      |
| 1 device          | 7 1/4              | 3 13/16 | 4 3/8 | 6 3/8               | 2 15/16 |
| 2 devices         | 7 1/4              | 3 13/16 | 4 3/8 | 6 3/8               | 2 15/16 |
| 3 devices         | 9 1/2              | 3 13/16 | 4 3/8 | 8 3/8               | 2 15/16 |
| 4 devices         | 11 3/4             | 3 13/16 | 4 3/8 | 10 7/8              | 2 15/16 |

# N2SU/N2SCU Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

4C

## Applications:

N2SU and N2SCU pushbutton stations, selector switches and pilot lights are suitable for use:

- In Class I, Groups B, C, D; Division 2 and Class I, Zones 1 and 2 hazardous areas where flammable vapors or gases may be present due to accidental or abnormal operation
- In damp, wet, or corrosive locations
- Indoors or outdoors in Division 2 and Class I, Zones 1 and 2 areas of petroleum refineries, chemical plants and other process industry facilities where similar hazards exist

N2SU and N2SCU pushbutton stations and selector switches are used:

- In conjunction with magnetic starters or contactors for remote control of motors

N2SU and N2SCU pilot lights are used:

- To visually indicate at a remote location that the desired function is being performed

Optional maintained stop pushbutton(s) are used: As emergency or normal stop button(s) in motor control circuits for positive shutdown.

## Features:

- Compact, strong, durable enclosures are made of *Vestamid*™ – a black molded high impact strength, polyester material having excellent corrosion resistance and stability to heat.
- Exterior parts of pushbuttons, pilot lights, and selector switches are made of *Krydon* material. See pages 552–553 for device part numbers
- Pushbutton design uses a unique internal neoprene boot which completely encloses all internal parts. A wiping gasket around the pushbutton cleans the wall of the pushbutton guard of any foreign material accumulation as the button is operated.
- Formed-in-place gasket, and stainless steel screws for added corrosion resistance.
- Pushbutton and pilot light guards are fluted for no-slip installation.
- Factory installed dead end (N2SU) or through feed (N2SCU) hubs – 1/2" and 3/4" sizes.
- Legend plates are available with 40 standard markings.
- Lockout is standard on selector switch devices.
- LED lamps are standard to provide longer life.

## Certifications and Compliances:

- NEMA: 3, 4X, 7BCD and 12
- UL Standard: 508
- CSA C22.2 No. 14 & 30

## Size Ranges:

- 1, 2, 3 and 4-device units

## Electrical Rating Ranges:

- Pushbutton stations and selector switches – heavy duty 600VAC maximum
- Pilot lights – 120 to 600 VAC

## Options:

### Description

Padlock attachments for all pushbuttons. For "START-STOP" stations, only "STOP" button provided with lockout (lockout standard with STOP).....

### Three-position selector switches with modified operation:

Momentary contact clockwise operation, spring return to center, maintained contact counterclockwise operation.....

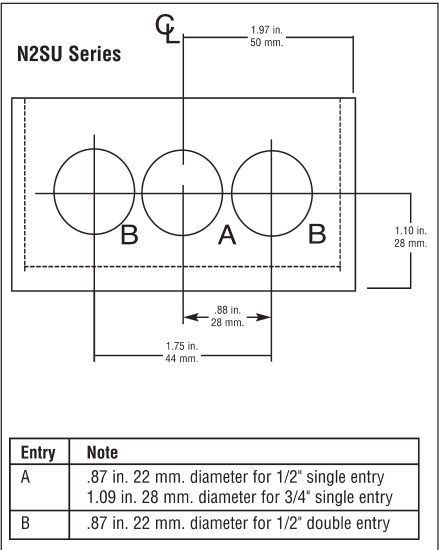
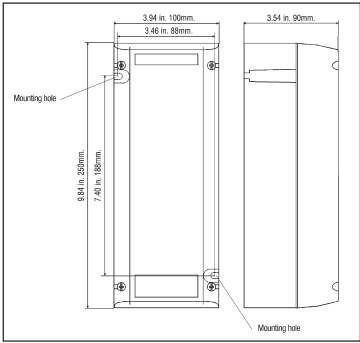
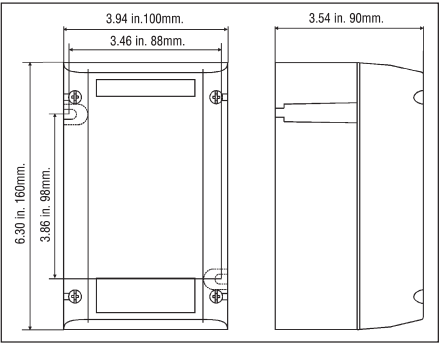
Momentary contact counterclockwise operation, spring return to center, maintained contact clockwise operation.....

One maintained stop pushbutton.....

**Note:** In addition to hub arrangements shown, the following can be obtained by inserting these codes for the 4th and 5th character in the catalog number:  
D = Double 1/2" hubs at bottom  
CD = Single hub at top, double 1/2" hubs at bottom  
DD = Double 1/2" hubs at each end

## Dimensions

### In Inches:



# 4C N2SU/N2SCU Control Stations

**Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty**

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

## Ordering Information - With Pushbuttons – Momentary Contact

| No. Units | Contact Symbol | Marking Unless Otherwise Specified | Enclosure with Pushbuttons |                          |                            |
|-----------|----------------|------------------------------------|----------------------------|--------------------------|----------------------------|
|           |                |                                    | Hub Size                   | Dead End Cat. #          | Through Feed Cat. #        |
| 1         |                | START<br>(or Specify)              | 1/2<br>3/4                 | N2S1110U ②<br>N2S2110U ② | N2SC1110U ②<br>N2SC2110U ② |
| 2         |                | START-STOP<br>(or Specify)         | 1/2<br>3/4                 | N2S1210U ②<br>N2S2210U ② | N2SC1210U ②<br>N2SC2210U ② |
| 3         |                | Specify                            | 1/2<br>3/4                 | N2S1310U ②<br>N2S2310U ② | N2SC1310U ②<br>N2SC2310U ② |
| 4         |                | Specify                            | 1/2<br>3/4                 | N2S1410U ②<br>N2S2410U ② | N2SC1410U ②<br>N2SC2410U ② |



Maintained pushbutton with pilot light control station

## Ordering Information - With Selector Switches\*

| Style                        | Position |   |   | Marking Unless Otherwise Specified | Enclosure with One Selector Switch |                          |                            |
|------------------------------|----------|---|---|------------------------------------|------------------------------------|--------------------------|----------------------------|
|                              | 1        | 2 | 3 |                                    | Hub Size                           | Dead End Cat. #          | Through Feed Cat. #        |
| Two-Position, Two-Circuit    | A1       |   |   | START-STOP<br>(or Specify)         | 1/2<br>3/4                         | N2S1121U ②<br>N2S2121U ② | N2SC1121U ②<br>N2SC2121U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
| Two-Position, Four-Circuit   | A1       |   |   | START-STOP<br>(or Specify)         | 1/2<br>3/4                         | N2S1122U ②<br>N2S2122U ② | N2SC1122U ②<br>N2SC2122U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
|                              | B1       |   |   |                                    |                                    |                          |                            |
| Three-Position, Two-Circuit  | A1       |   |   | Specify                            | 1/2<br>3/4                         | N2S1123U ②<br>N2S2123U ② | N2SC1123U ②<br>N2SC2123U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
| Three-Position, Four-Circuit | A1       |   |   | Specify                            | 1/2<br>3/4                         | N2S1124U ②<br>N2S2124U ② | N2SC1124U ②<br>N2SC2124U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |
|                              | B1       |   |   |                                    |                                    |                          |                            |
| Three-Position, Four-Circuit | A1       |   |   | Specify                            | 1/2<br>3/4                         | N2S1125U ②<br>N2S2125U ② | N2SC1125U ②<br>N2SC2125U ② |
|                              | A2       |   |   |                                    |                                    |                          |                            |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

### Marking

|               |         |                     |                     |
|---------------|---------|---------------------|---------------------|
| Push Buttons: | REVERSE | Selector Switches – | Selector Switches – |
| START         | OPEN    | Two-Position:       | Three-Position      |
| STOP          | CLOSE   | RUN-JOG             | RUN-OFF-JOG         |
| ON            | UP      | HAND-AUTO           | HAND-OFF-AUTO       |
| OFF           | DOWN    | FOR-REV             | FOR-OFF-REV         |
| RUN           | IN      | FAST-SLOW           | FAST-OFF-SLOW       |
| JOG           | OUT     | OPEN-CLOSE          | 1-OFF-2             |
| TRIP          | RAISE   | UP-DOWN             | OPEN-OFF-CLOSE      |
| RESET         | LOWER   | ON-OFF              | UP-OFF-DOWN         |
| TEST          |         | IN-OUT              |                     |
| LIGHT ON      |         | RAISE-LOWER         |                     |
| HAND          |         | START-STOP          |                     |
| AUTOMATIC     |         |                     |                     |
| EMERGENCY     |         |                     |                     |
| FORWARD       |         |                     |                     |

\*Replacement switch for selector switches is Cat. No. ESWP126.

N2SU/N2SCU  
Control Stations

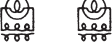
Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

4C

Ordering Information - With Pilot Lights - Transformer Type

|           |                                                                                   |       | Enclosure with Pilot Lights† |                     |                 |                     |
|-----------|-----------------------------------------------------------------------------------|-------|------------------------------|---------------------|-----------------|---------------------|
| No. Units | Diagram                                                                           | Volts | 1/2" Hubs                    |                     | 3/4" Hubs       |                     |
|           |                                                                                   |       | Dead End Cat. #              | Through Feed Cat. # | Dead End Cat. # | Through Feed Cat. # |
| 1         |  | 120   | N2S1131U ①                   | N2SC1131U ①         | N2S2131U ①      | N2SC2131U ①         |
|           |                                                                                   | 240   | N2S1132U ①                   | N2SC1132U ①         | N2S2132U ①      | N2SC2132U ①         |
| 2         |  | 120   | N2S1231U ①                   | N2SC1231U ①         | N2S2231U ①      | N2SC2231U ①         |
|           |                                                                                   | 240   | N2S1232U ①                   | N2SC1232U ①         | N2S2232U ①      | N2SC2232U ①         |
| 3         |  | 120   | N2S1331U ①                   | N2SC1331U ①         | N2S2331U ①      | N2SC2331U ①         |
|           |                                                                                   | 240   | N2S1332U ①                   | N2SC1332U ①         | N2S2332U ①      | N2SC2332U ①         |
| 4         |  | 120   | N2S1431U ①                   | N2SC1431U ①         | N2S2431U ①      | N2SC2431U ①         |
|           |                                                                                   | 240   | N2S1432U ①                   | N2SC1432U ①         | N2S2432U ①      | N2SC2432U ①         |

① Specify lens color for each pilot light. As an example, N2S1231U with one red and one green would be ordered as N2S1231U-J1-J3

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

†Pilot lights are transformer type except those rated 120 volts.

4C



# 4C N2SU/N2SCU Control Stations

Factory Sealed, Corrosion-Resistant  
600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D  
Corrosion-Resistant  
Dust-tight  
Watertight  
Weatherproof  
NEMA 3, 4X, 7BCD (Div. 2), 12

Cl. II, Div. 2, Groups F, G  
Cl. I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>  
IP66

## Ordering Information - Combination Control Stations†\*

| Pilot Lights* | Pushbuttons | Diagram                                                                           | Marking Unless Otherwise Specified | Volts | Enclosure with Push Buttons and Pilot Lights† |                     |                 |                     |
|---------------|-------------|-----------------------------------------------------------------------------------|------------------------------------|-------|-----------------------------------------------|---------------------|-----------------|---------------------|
|               |             |                                                                                   |                                    |       | 1/2" Hubs                                     |                     | 3/4" Hubs       |                     |
|               |             |                                                                                   |                                    |       | Dead End Cat. #                               | Through Feed Cat. # | Dead End Cat. # | Through Feed Cat. # |
|               |             |                                                                                   |                                    |       |                                               |                     |                 |                     |
| 1             | 1           |  | Specify                            | 120   | N2S12411U ①②                                  | N2SC12411U ①②       | N2S22411U ①②    | N2SC22411U ①②       |
|               |             |                                                                                   |                                    | 240   | N2S12412U ①②                                  | N2SC12412U ①②       | N2S22412U ①②    | N2SC22412U ①②       |
| 1             | 2           |  | START-STOP (or Specify)            | 120   | N2S13421U ①②                                  | N2SC13421U ①②       | N2S23421U ①     | N2SC23421U ①②       |
|               |             |                                                                                   |                                    | 240   | N2S13422U ①②                                  | N2SC13422U ①②       | N2S23422U ①     | N2SC23422U ①②       |
| 2             | 1           |  | Specify                            | 120   | N2S13411U ①②                                  | N2SC13411U ①②       | N2S23411U ①②    | N2SC23411U ①②       |
|               |             |                                                                                   |                                    | 240   | N2S13412U ①②                                  | N2SC13412U ①②       | N2S23412U ①②    | N2SC23412U ①②       |
| 2             | 2           |  | START-STOP (or Specify)            | 120   | N2S14421U ①②                                  | N2SC14421U ①②       | N2S24421U ①②    | N2SC24421U ①②       |
|               |             |                                                                                   |                                    | 240   | N2S14422U ①②                                  | N2SC14422U ①②       | N2S24422U ①②    | N2SC24422U ①②       |

|                                                                                     |                                                                                                                                                                         | Selector Switches<br>Position No.                                                      |                                                                                     |                                                                                     |          | Enclosure With Pilot Light, Pushbuttons and Selector Switch |       |                                |                                  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|-------------------------------------------------------------|-------|--------------------------------|----------------------------------|
| Pilot Lights*                                                                       | Pushbuttons                                                                                                                                                             | 1                                                                                      | 2                                                                                   | 3                                                                                   | Markings | Hub Size in.                                                | Volts | Dead End Cat. #                | Through Feed Cat. #              |
| 1                                                                                   | 2                                                                                                                                                                       | Two-Position, Two-Circuit                                                              |                                                                                     |                                                                                     |          | ½<br>¾                                                      | 120   | N2S145211U ①②<br>N2S245211U ①② | N2SC145211U ①②<br>N2SC245211U ①② |
|  |   | A1  |  |                                                                                     | Specify  | ½<br>¾                                                      | 240   | N2S145212U ①②<br>N2S245212U ①② | N2SC145212U ①②<br>N2SC245212U ①② |
| 1                                                                                   | 2                                                                                                                                                                       | Three-Position, Two-Circuit                                                            |                                                                                     |                                                                                     |          | ½<br>¾                                                      | 120   | N2S145231U ①②<br>N2S245231U ①② | N2SC145231U ①②<br>N2SC245231U ①② |
|  |   | A1  |  |  | Specify  | ½<br>¾                                                      | 240   | N2S145232U ①②<br>N2S245232U ①② | N2SC145232U ①②<br>N2SC245232U ①② |

① Specify lens color for each pilot light. As an example, N2S1231U with one red and one green would be ordered as N2S1231U-J1-J3

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

| Marking       |                                   |                                     |
|---------------|-----------------------------------|-------------------------------------|
| Push Buttons: | Selector Switches – Two-Position: | Selector Switches – Three-Position: |
| START         | FORWARD                           | RUN-JOG                             |
| STOP          | REVERSE                           | HAND-AUTO                           |
| ON            | OPEN                              | FOR-OFF-REV                         |
| OFF           | CLOSE                             | FAST-SLOW                           |
| RUN           | UP                                | OPEN-CLOSE                          |
| JOG           | DOWN                              | UP-DOWN                             |
| TRIP          | IN                                | ON-OFF                              |
| RESET         | OUT                               | IN-OUT                              |
| TEST          | RAISE                             | RAISE-LOWER                         |
| LIGHT ON      | LOWER                             | START-STOP                          |
| HAND          |                                   |                                     |
| AUTOMATIC     |                                   |                                     |
| EMERGENCY     |                                   |                                     |

\*Replacement switch for selector switches is Cat. No. ESWP126.

†Pilot lights are transformer type except those rated 120 volts.

Crouse-Hinds  
by **E.T.N**

# N2FA and N2FAC Fire Alarm Stations

Cl. I, Div. 2, Groups B, C, D  
NEMA 3, 7BCD (Div. 2), 12  
Raintight  
Wet Locations

4C

Factory Sealed, Corrosion-Resistant

### Applications:

- N2FA and N2FAC fire alarm stations are used:
- As break-glass fire alarm stations
  - In conjunction with audible and/or visible signaling devices to alert personnel of a fire hazard
  - In Class I, Division 2, Groups B, C, D hazardous areas where flammable vapors or gases may be present due to an accident or abnormal operation
  - In damp, wet or corrosive locations
  - Indoors or outdoors in Division 2 areas of petroleum refineries, chemical plants and other process industry facilities where similar hazards exist

### Features:

- Factory sealed. External seals are not required.
- Enclosures are made of *Krydon*® fiberglass-reinforced polyester material having excellent corrosion resistance and stability to heat and sunlight.
- Highly visible molded-in red color for quick identification.
- Break-glass rod is attached to station with a chain for ready access during an emergency.
- Factory installed dead end (N2FA) or through feed (N2FAC) hubs – 1/2", 3/4" and 1" sizes.

### Certifications and Compliances:

- NEC:  
Class I, Division 2, Groups B, C, D
- NEMA 3, 7BCD (Division 2), 12

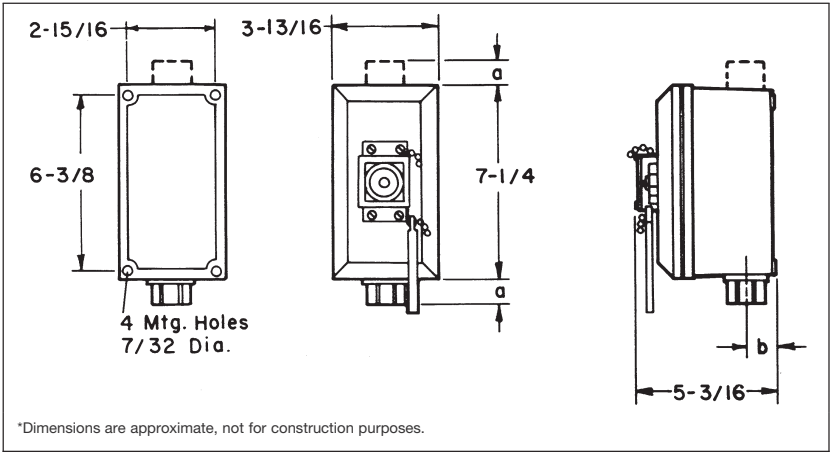


4C

### Ordering Information

| Hub Size | Dead End Cat. # | Through Feed Cat. # | Replacement Glass Cat. # |
|----------|-----------------|---------------------|--------------------------|
| 1/2      | N2FA11          | N2FAC11             | DS K14                   |
| 3/4      | N2FA21          | N2FAC21             | DS K14                   |
| 1        | N2FA31          | N2FAC31             | DS K14                   |

### Dimensions\* In Inches:



| 1/2" & 3/4" Hubs |        | 1" Hubs |        |
|------------------|--------|---------|--------|
| a                | b      | a       | b      |
| 1 1/8            | 1 1/16 | 1 1/4   | 1 5/16 |

## 4C GHG43 Series Control Stations

**Nonmetallic or 316L Stainless  
Steel Corrosion Resistant**

UL/cUL listed  
Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zones 1 and 2,  
(A) Ex de IIB + H<sub>2</sub> T6  
Cl. II, Div. 1, Groups E, F, G (cUL)

PTB ATEX CERTIFIED 3117  
Ex de IIC, T6,  
Zones 1 and 2  
Ex de IIC, T6 Zones 21 and 22  
IP 66, NEMA 4X

### Applications:

Control stations are used as a remote means of:

- Motor control
- Visual indication of equipment performance
- On-off control of circuits
- Circuit selection

Common applications include:

- Areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- For installation at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist

### Features:

- NEMA 4X, IP66 enclosure with formed-in-place gasket
- Available with all operators: indicator lights, potentiometers, control switches, pushbuttons, terminal blocks and meters
- Base-mounted contact blocks
- Easy change-out components snap in place on DIN rail
- Enclosure meets UL 94-VO. Also available in anti-static Ex e materials
- Inserts for mounting DIN rails
- Available with a maximum of 2 entries - top and bottom for conduit fittings or cable glands
- Suitable for universal mounting plates on pipes, conduit, wall or channels
- Mounting dimensions data molded on back
- Captive, corrosion-resistant cover screws
- Built-in mounting slots for wall installation
- Available in 316L stainless steel

### Certifications and Compliances:

- UL/cUL Listed
- Class I, Div. 2, Groups A, B, C, D
- Class II, Div. 1, Groups E, F, G (cUL)
- Class I, Zones 1 and 2, Ex de IIB + H<sub>2</sub>, T6
- AEx de IIB + H<sub>2</sub>, T6
- Type 3, 4, 4X; IP66
- CENELEC-PTB 00 ATEX 3117
- Ex de IIC, T6, Zones 1 and 2, IP66

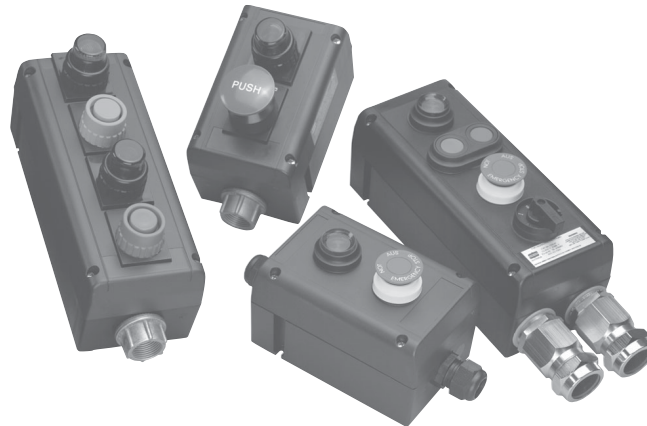
### Options:

#### Description

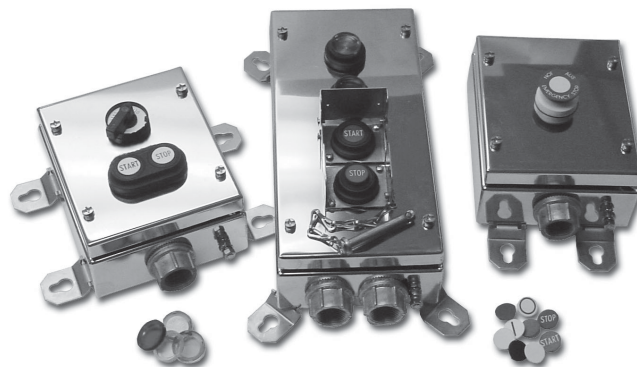
Eaton's Crouse-Hinds GHG43 Series control stations are now available with 316L stainless steel enclosures, making them ideal for corrosive and adverse locations - especially offshore platform applications

#### Suffix

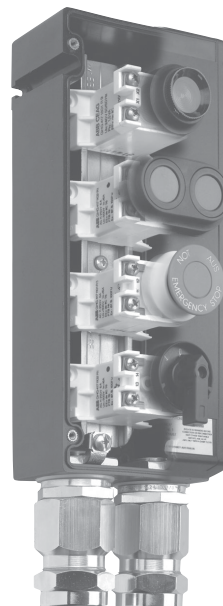
**S860**



**GHG43 Nonmetallic Control Stations**

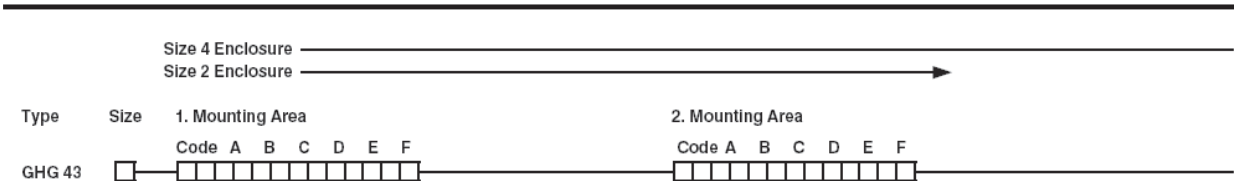


**GHG43 Stainless Steel Control Stations**

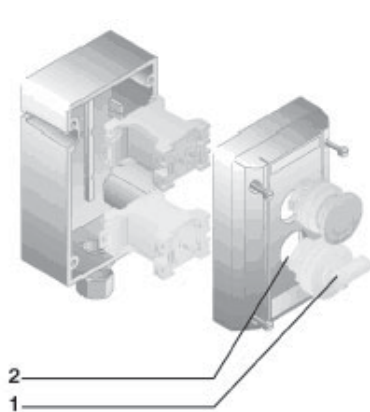


**Crouse-Hinds**  
by **Eaton**

Nonmetallic or 316L Stainless  
Steel Corrosion Resistant



GHG43 2 - Size 2 Enclosure



Mounting Area\*



Pushbutton DRT

Code A     B   C   D

Codes see page 559

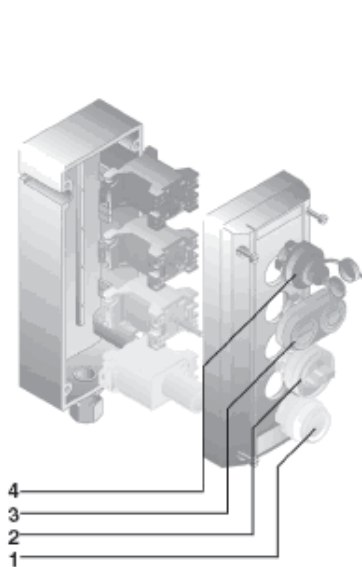


Double Pushbutton

Code A      B   C   D   E

Codes see page 559

GHG43 4 - Size 4 Enclosure



Mounting Area\*



Key Operated Pushbutton

Code A     B   C

Codes see page 559



Mushroom-Head Pushbutton

Code A      B   C   D   E   F

Codes see page 560



Signal Lamp

Code A     B   C

Codes see page 560

‡For a GHG43 control station with 316L stainless steel enclosure, add suffix "S860" to end of catalog number.  
\*Unoccupied spaces must be filled in with KLM for correct positioning of devices.

### Nonmetallic or 316L Stainless Steel Corrosion Resistant

| 3. Mounting Area |   |   |   |   |   |   | 4. Mounting Area |   |   |   |   |   |   | Cable Entries |        |
|------------------|---|---|---|---|---|---|------------------|---|---|---|---|---|---|---------------|--------|
| Code             | A | B | C | D | E | F | Code             | A | B | C | D | E | F | Top           | Bottom |
|                  |   |   |   |   |   |   |                  |   |   |   |   |   |   |               |        |



Potentiometer

Code A **P** **O** **T**    B ☐

Codes see page 561



Measuring Instrument

Code A **M** **7** **2**    B ☐    C ☐

Codes see page 562  
Requires 2 spaces

Switch

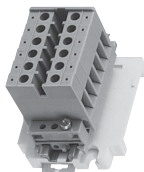
Code A **S** **C** **T**    B ☐    C ☐    D ☐

Codes see pages 563–564



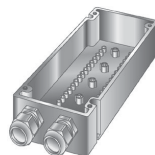
Control Switch Ex 23 10A

Code A **E** **X** **2** **3**    B ☐    C ☐    D ☐    E ☐

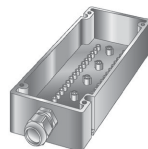
Codes see pages 563–564  
Requires 2 spacesTerminals and cover  
blanking plug

Code A **K** **L** **M**    B ☐

Code see page 561



Two entries



One entry

### Cable Entries

#### NPT

**00**

No entries

**12**2 x 1/2" Myers Hub,  
STGK1 Zinc Gland  
plate**13**2 x 3/4" Myers Hub,  
STGK2 Zinc Gland  
plate  
(Stainless Steel  
Control Stations only)**22**2 x 1/2" Myers Hub,  
SSTGK1 Stainless  
steel  
Gland plate**23**2 x 3/4" Myers Hub,  
SSTGK2 Stainless  
steel  
Gland plate  
(Stainless Steel  
Control Stations only)**26**1 x 1/4" Myers Hub,  
STGK2, Zone 1  
Gland plate**30**1 x 1/2" Myers Hub,  
STGK1, Zone 1  
Gland plate**31**1 x 1/2" Myers Hub,  
SSTGK1 Stainless st.  
Gland plate**32**1 x 3/4" Myers Hub,  
SSTGK2 Stainless st.  
Gland plate

#### Metric

**00**

No entries

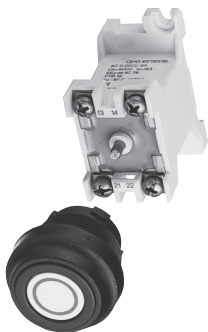
**01**2 x M25 Plastic  
Cable gland M25  
Blanking plug**02**2 x M20  
Threaded entries  
Gland plate**03**2 x M25  
Threaded entries  
Gland plate**04**1 x M32 Plastic  
Cable gland**27**1 x M25  
Threaded Entry,  
Blanking plug and  
Gland plate**29**2 x M25  
Threaded Entry,  
1 blanking plug and  
Gland plate**33**1 x M20  
Threaded entry  
Blanking plug and  
Gland plate**34**1 x 3/4"  
Myers Hub  
SSTGK2 stainless  
steel,  
Gland plate

‡For a GHG43 control station with 316L stainless steel enclosure, add suffix "S860" to end of catalog number.  
\*Unoccupied spaces must be filled in with KLM for correct positioning of devices.

## Nonmetallic or 316L Stainless Steel Corrosion Resistant

### Pushbuttons:

- Used for logic controls in hazardous areas
- Single or double units
- Used with all operators
- Base mounting



| Pushbutton                     |
|--------------------------------|
| Type of Protection             |
| Certificate of Conformity      |
| Approvals                      |
| Rated Voltage                  |
| Rated Current                  |
| Terminal Wiring                |
| Mechanical and Electrical Life |

Ex de IIC T6  
PTB No. Ex-87.B.1007U  
PTB, UL, cUL  
Up to 400V  
NEC/CEC 10A IEC 16 A  
2 x 2.5mm<sup>2</sup> / 14AWG  
>10<sup>5</sup> Operations

See page 564 for explanation of contact symbols.

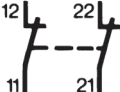
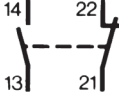
### Pushbutton DRT

|                      |                                                                               |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
|----------------------|-------------------------------------------------------------------------------|----|----|----|------|-------------------------------------------------------------------------------|-------------------------|----|--------------------------------------------|----|-------------------------------------------------------------------------------|-----------------------------------|----|----|----|
|                      | <table><tr><td>D</td><td>R</td><td>T</td><td>O</td></tr></table>              | D  | R  | T  | O    | <table><tr><td></td><td></td></tr></table>                                    |                         |    | <table><tr><td></td><td></td></tr></table> |    |                                                                               | <table><tr><td></td></tr></table> |    |    |    |
| D                    | R                                                                             | T  | O  |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
|                      |                                                                               |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
|                      |                                                                               |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
|                      |                                                                               |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| Code                 | A                                                                             | B  | C  | D  |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| Contact System       | <table><tr><td>12</td><td>22</td></tr><tr><td>11</td><td>21</td></tr></table> | 12 | 22 | 11 | 21   | <table><tr><td>14</td><td>24</td></tr><tr><td>13</td><td>23</td></tr></table> | 14                      | 24 | 13                                         | 23 | <table><tr><td>14</td><td>22</td></tr><tr><td>13</td><td>21</td></tr></table> | 14                                | 22 | 13 | 21 |
| 12                   | 22                                                                            |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| 11                   | 21                                                                            |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| 14                   | 24                                                                            |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| 13                   | 23                                                                            |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| 14                   | 22                                                                            |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| 13                   | 21                                                                            |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| Code B               | 13                                                                            | 14 | 15 |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |
| Inscription          | ALL *                                                                         | 0  | I  | II | Stop | Start                                                                         | Special-Text On Order † |    |                                            |    |                                                                               |                                   |    |    |    |
| Code C               | 01                                                                            | 02 | 03 | 04 | 06   | 07                                                                            | 99                      |    |                                            |    |                                                                               |                                   |    |    |    |
| Lockout see page 565 |                                                                               |    |    |    |      |                                                                               |                         |    |                                            |    |                                                                               |                                   |    |    |    |

Lockout see page 565

Code D (leave blank if no lockout required)

### Double Pushbutton DDTO

|                      |                                                                                     |                                                                                       |                                                                                       |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
|----------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----|------|--------------------------------------------|-------------------------|--|--------------------------------------------|--|--|--------------------------------------------|--|--|-----------------------------------|--|
|                      | <table><tr><td>D</td><td>D</td><td>T</td><td>O</td></tr></table>                    | D                                                                                     | D                                                                                     | T  | O    | <table><tr><td></td><td></td></tr></table> |                         |  | <table><tr><td></td><td></td></tr></table> |  |  | <table><tr><td></td><td></td></tr></table> |  |  | <table><tr><td></td></tr></table> |  |
| D                    | D                                                                                   | T                                                                                     | O                                                                                     |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
|                      |                                                                                     |                                                                                       |                                                                                       |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
|                      |                                                                                     |                                                                                       |                                                                                       |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
|                      |                                                                                     |                                                                                       |                                                                                       |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
|                      |                                                                                     |                                                                                       |                                                                                       |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
| Code                 | A                                                                                   | B                                                                                     | C                                                                                     | D  | E    |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
| Contact System       |  |  |  |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
| Code B               | 43                                                                                  | 44                                                                                    | 45                                                                                    |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |
| Inscription          | ALL *                                                                               | 0                                                                                     | I                                                                                     | II | Stop | Start                                      | Special-Text on Order † |  |                                            |  |  |                                            |  |  |                                   |  |
| Code C, D Left/Right | 01                                                                                  | 02                                                                                    | 03                                                                                    | 04 | 06   | 07                                         | 99                      |  |                                            |  |  |                                            |  |  |                                   |  |
| Lockout see page 565 |                                                                                     |                                                                                       |                                                                                       |    |      |                                            |                         |  |                                            |  |  |                                            |  |  |                                   |  |

Lockout see page 565

Code E (leave blank if no lockout required)

### Key-Operated Pushbutton SLT

|                |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
|----------------|------------------------------------------------------------------|-----|-----|-----|-----|--------------------------------------------|-----|--|-----------------------------------|--|
|                | <table><tr><td>S</td><td>L</td><td>T</td><td>O</td></tr></table> | S   | L   | T   | O   | <table><tr><td></td><td></td></tr></table> |     |  | <table><tr><td></td></tr></table> |  |
| S              | L                                                                | T   | O   |     |     |                                            |     |  |                                   |  |
|                |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
|                |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
| Code           | A                                                                | B   | C   |     |     |                                            |     |  |                                   |  |
| Contact System |                                                                  |     |     |     |     |                                            |     |  |                                   |  |
| Code B         | 23                                                               | 24  | 25  |     |     |                                            |     |  |                                   |  |
| Pushbutton     | Key                                                              |     |     |     |     |                                            |     |  |                                   |  |
| Not Depressed  | Lockable                                                         | Yes | Yes | Yes | No  | No                                         | Yes |  |                                   |  |
|                | Key Removable                                                    | Yes | Yes | No  | No  | Yes                                        | Yes |  |                                   |  |
| Depressed      | Lockable                                                         | Yes | No  | Yes | Yes | Auto                                       | Yes |  |                                   |  |
|                | Key Removable                                                    | No  | No  | Yes | Yes | Yes                                        | Yes |  |                                   |  |
| Code C         |                                                                  | 1   | 2   | 3   | 4   | 5                                          | 6   |  |                                   |  |

\* 01 - Includes the following discs - Start, stop, I, O, and red, green, yellow, white and black blank discs.

† For Marking Guide for Pushbuttons see page 565.

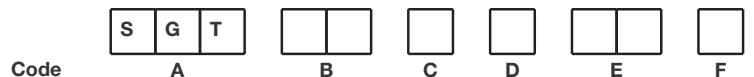
**Crouse-Hinds**

by **Eaton**



Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

## Mushroom-Head Pushbutton SGT



## Contact System



|                                             |               |            |                |
|---------------------------------------------|---------------|------------|----------------|
| Code B                                      | 53            | 54         | 55             |
| Color of Pushbutton                         | Red           | Yellow     | Black Actuator |
| Code C                                      | 1             | 2          | 3              |
| Function                                    | Spring Return | Maintained | Key Release    |
| Code D                                      | 1             | 2          | 3              |
| Inscription                                 | Stop          | Start      | Black Actuator |
| Code E                                      | 06            | 07         | 11             |
| Lockout<br>see page 565                     |               |            |                |
| Code F (leave blank if no lockout required) |               |            |                |

## Signal Lamp

- Used for positive feedback indication
- High intensity with special reflector and optical lens
- Accommodates most input voltages
- Base mounting



|                           | Lamp                                     |
|---------------------------|------------------------------------------|
| Type of Protection        | Ex de IIC T6                             |
| Certificate of Conformity | PTB No. Ex-88.B.2106U                    |
| Approvals                 | PTB, UL, cUL                             |
| Lamp Life                 | >100,000 Hours (11.5 Years)              |
| Rated Voltages            | Up to 240VAC, 50 / 60 Hz<br>Up to 110VDC |
| Rated Current             | Max. 15 mA                               |
| Power Consumption         | <1.2W                                    |
| Terminal Wiring           | 2 x 2.5mm <sup>2</sup> / 14AWG           |
| Colors                    | Red, Green, Yellow, Clear & Blue         |

## Signal Lamp SIL



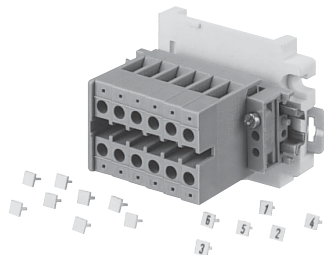
| Colored Lens Cover | White        | Yellow | Red | 1 pkg white, yellow, red, green | Green | Blue |
|--------------------|--------------|--------|-----|---------------------------------|-------|------|
| Code B             | 1            | 2      | 3   | 4                               | 5     | 6    |
| Voltage            | 20-250VAC/DC |        |     | 10-33VAC/DC                     |       |      |
| Code C             | 01           |        |     | 31                              |       |      |



Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

Terminal Blocks

- Terminal block for easy field connections
- Base mounting



| Terminal Blocks           |                       |
|---------------------------|-----------------------|
| Type of Protection        | Ex e II               |
| Certificate of Conformity | PTB No. Ex-88.B.3112U |
| Rated Voltages            | Up to 400V            |
| Rated Current             | 23A                   |
| Conductor Size            | 4mm² / 12AWG          |

Terminals and Cover Plugs  
KLM

|      |   |   |   |   |  |
|------|---|---|---|---|--|
|      | K | L | M |   |  |
| Code | A |   |   | B |  |

|        | 6 Terminals 2 x 4 mm² | Undrilled Cover (No Terminals) |
|--------|-----------------------|--------------------------------|
| Code B | 61                    | 00                             |

Potentiometers

- Used to adjust resistance to vary motor speed or light levels
- Scale 0 to 100%
- Base mounting



| Potentiometers            |                       |
|---------------------------|-----------------------|
| Type of Protection        | Ex de IIC T6          |
| Certificate of Conformity | PTB No. Ex-87.B.1007U |
| Approvals                 | PTB, UL, cUL          |
| Rated Voltages            | >250V                 |
| Power Consumption         | 1.0W                  |
| Resistance                | 100–10,000W           |
| Angle of Rotation         | 270°                  |
| Scale                     | 0–100%                |
| Connection Terminals      | 2 x 2.5mm² / 14AWG    |

Potentiometer POT

|      |   |   |   |   |
|------|---|---|---|---|
|      | P | O | T |   |
| Code | A |   |   | B |

| Power Consumption | 1W    |       |       |        |
|-------------------|-------|-------|-------|--------|
| Resistance W      | 1,000 | 2,200 | 4,700 | 10,000 |
| Code B            | 4     | 7     | 5     | 6      |

**Nonmetallic or 316L Stainless Steel  
Corrosion Resistant****Ammeters**

- Used to measure motor current draw for efficiencies and maintenance
- Slide in scales to accommodate any amperage range
- Red indicator for quick visual indication to compare set points and actual values

**Ammeters**

|                                  |                                  |
|----------------------------------|----------------------------------|
| <b>Type of Protection</b>        | Ex e II T6                       |
| <b>Certificate of Conformity</b> | PTB No. Ex-87.B.2016U            |
| <b>Approvals</b>                 | PTB, UL, cUL                     |
| <b>Movement</b>                  | Moving iron (core)               |
| <b>Accuracy</b>                  | 2.5% of range (class 2.5)        |
| <b>Measuring Range</b>           | 0-16A direct, C.T. n/1 A         |
| <b>Operating Position</b>        | Vertical                         |
| <b>Scale</b>                     | Interchangeable for C.T. n/1 A   |
| <b>Zero Adjustment</b>           | At instrument                    |
| <b>Terminal Wiring</b>           | 2 x 2.5 mm <sup>2</sup> / 14 AWG |
| <b>Rated Current Marking</b>     | Red indicator                    |

**Ammeter Measuring  
Instrument AM 72\***

|   |   |   |  |  |  |
|---|---|---|--|--|--|
| M | 7 | 2 |  |  |  |
|---|---|---|--|--|--|

Code                      A                      B                      C

|                 |               |              |                 |                |
|-----------------|---------------|--------------|-----------------|----------------|
| <b>Movement</b> | <b>Direct</b> | <b>n/1 A</b> | <b>0 - 2 mA</b> | <b>4-20 mA</b> |
| <b>Code B</b>   | 1             | 2            | 3               | 6              |

Movements 0-20 mA and 4-20 mA are only available with 0 - 100 / 120% scale

| <b>Direct Measurement</b> |               | <b>Interchangeable Scale for C.T. n/1A</b> |               |               |               |               |              |
|---------------------------|---------------|--------------------------------------------|---------------|---------------|---------------|---------------|--------------|
| <b>Code C</b>             | <b>Scale</b>  | <b>Code C</b>                              | <b>Scale</b>  | <b>Code C</b> | <b>Scale</b>  | <b>Code C</b> | <b>Scale</b> |
| 02                        | 0 - 1/1.5A    | 02                                         | 0 - 1/1.5A    | 09            | 0 - 30/45A    | 16            | 0 - 200/300A |
| 03                        | 0 - 2.5/3.75A | 03                                         | 0 - 2.5/3.75A | 10            | 0 - 40/60A    | 17            | 0 - 250/375A |
| 04                        | 0 - 5/7.5A    | 04                                         | 0 - 5/7.5A    | 11            | 0 - 50/75A    | 18            | 0 - 300/450A |
| 05                        | 0 - 10/15A    | 05                                         | 0 - 10/15A    | 12            | 0 - 60/90A    | 19            | 0 - 400/600A |
| 07                        | 0 - 16/24A    | 06                                         | 0 - 15/22.5A  | 13            | 0 - 75/112.5A | 20            | 0 - 500/750A |
|                           |               | 08                                         | 0 - 20/30A    | 14            | 0 - 100/150A  | 21            | 0 - 600/900A |
|                           |               |                                            |               | 15            | 0 - 150/225A  | 22            | 0 - 100/150A |

\* Requires 2 spaces.

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

Rotary Control Switches

- Used for selectable operations (i.e. Hand-Off-Auto)
- 2 independent contacts
- Available in any contact configuration
- Spring return or maintained position
- Available with lockout positions



|                           | SCT                                                                           | Ex 23                                                                                                        |
|---------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Type of Protection        | Ex de IIC T6                                                                  | Ex de IIC T6                                                                                                 |
| Certificate of Conformity | Ex.87.B.1007U                                                                 | PTB no. Ex-88.B.1047U                                                                                        |
| Approvals                 | PTB, UL, cUL                                                                  | PTB, UL, cUL                                                                                                 |
| Rated Voltage             | 400 V                                                                         | Up to 500 V                                                                                                  |
| Rated Current             | NEC 10 A<br>IEC 16 A                                                          | NEC 10 A<br>IEC 16 A                                                                                         |
| Terminal Wiring           | 2 x 2.5mm <sup>2</sup> / 14 AWG                                               | 2 x 2.5mm <sup>2</sup> / 14 AWG                                                                              |
| Mechanical Life           | >10 <sup>5</sup> Operations                                                   | >10 <sup>5</sup> Operations                                                                                  |
| Electrical Life           | >10 <sup>5</sup> Operations                                                   | >10 <sup>5</sup> Operations                                                                                  |
| Switching Capacity        | AC II: 20V/6A<br>400V/4A<br>DC II: 24V/6A<br>60V/0.8A<br>110V/.5A<br>220V/.2A | AC I: 500G/10A<br>AC II: 230V/6A<br>500V/6A<br>DC II: 24V/6A<br>48V/4A<br>60V/0.8A<br>110V/0.5A<br>220V/0.4A |

Rotary Control Switch SCT

Code

S

C

T

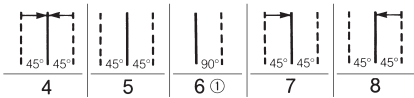
A

B

C

D

Switch Mechanism



| Code B |             |       |        |                                     |        |       |
|--------|-------------|-------|--------|-------------------------------------|--------|-------|
| Code C | Inscription |       | Code C | Inscription                         |        |       |
| 01     | 0           | I     | 07     | I                                   | 0      | II    |
| 03     | STOP        | START | 13     | LOCAL                               | REMOTE | AUTO  |
| 04     | HAND        | AUTO  | 14     | STOP                                | 0      | START |
| 06     | REMOTE      | LOCAL | 15     | HAND                                | 0      | AUTO  |
| 29     | OFF         | ON    | 99     | Special – text to be given on order |        |       |

Same as SCT above except up to 4 independent contacts



Contact System



Code D

1

2

3

4

5

6

Rotary Control Switch Ex 23\*

Code

E

x

2

3

A

B

C

D

E

| Code B | Inscription                         |
|--------|-------------------------------------|
| 01     | 0                                   |
| 03     | STOP                                |
| 04     | HAND                                |
| 06     | remote                              |
| 07     | I                                   |
| 13     | LOCAL                               |
| 14     | STOP                                |
| 23     | OFF                                 |
| 24     | HAND                                |
| 27     | START                               |
| 29     | OFF                                 |
| 32     | ON                                  |
| 99     | Special – text to be given on order |
|        | I                                   |
|        | START                               |
|        | AUTO                                |
|        | local                               |
|        | 0                                   |
|        | REMOTE                              |
|        | 0                                   |
|        | 0                                   |
|        | OFF                                 |
|        | STOP                                |
|        | ON                                  |
|        | OFF                                 |
|        | AUTO                                |
|        | START                               |
|        | ON                                  |
|        | AUTO                                |

\* Requires 2 spaces in cover.

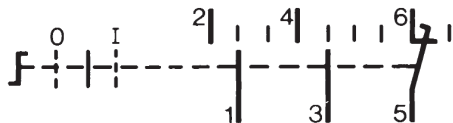
Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

4C

| Code C                           | Contact System | Type                    | Code C | Contact System | Type                              |
|----------------------------------|----------------|-------------------------|--------|----------------|-----------------------------------|
| 00                               |                | 2 Position              | 09     |                | 3 Position                        |
| 01                               |                | 2 Position              | 10     |                | 3 Position                        |
| 02                               |                | 2 Position              | 12     |                | 3 Position                        |
| 03                               |                | Single Pole Changeover  | 13     |                | 2 Position                        |
| 05                               |                | HOA                     | 14     |                | 2 Position                        |
| 07                               |                | 3 Position Single Level | 15     |                | 3 Position Double Pole Changeover |
| <b>Switched Mechanism Code D</b> |                |                         |        |                |                                   |

**Padlocking Facility  
Code E****Contact Configurations**

|                                           |  |  |                                     |
|-------------------------------------------|--|--|-------------------------------------|
| Normally Closed                           |  |  | Normally Open                       |
| Normally Closed Extended Over 2 Positions |  |  | Normally Open Early Make/Late Break |
| Change-Over Break Before Make             |  |  | Change-Over Make Before Break       |

**Example of Switch Type 10**

This example is the switch type 10 Stop-Run-Stop. The switch has 3 positions – the normal position is center and can be switched left or right. An arrow ( $\leftrightarrow$ ) indicates spring return. (See codes for switch mechanism). Contacts 1-2 only close in the Stop position. Contacts 3-4 close only in the Start position. Contacts 5-6 are normally closed and remain closed when switched to the Start position and open when switched to the Stop position.

Nonmetallic or 316L Stainless Steel  
Corrosion Resistant

Lockouts for DRTO Pushbuttons



**X**  
**Code D**  
Shroud Cover For  
Pushbutton  
Y-Lockout with bolt and chain



**Z**  
**Code D**  
Padlocking Fire Alarm  
Cover For Pushbutton

Lockouts for DDTO Double Pushbuttons



**X**  
**Code ED**  
Padlocking Cover For  
Double Pushbutton  
Without Hole



**Z**  
**Code E**  
Padlocking Cover For  
Double Pushbutton  
With Hole

Lockouts for SGT Mushroom-Head Pushbuttons



**X**  
**Code F**  
Padlocking Cover For  
Emergency Stop Pushbutton



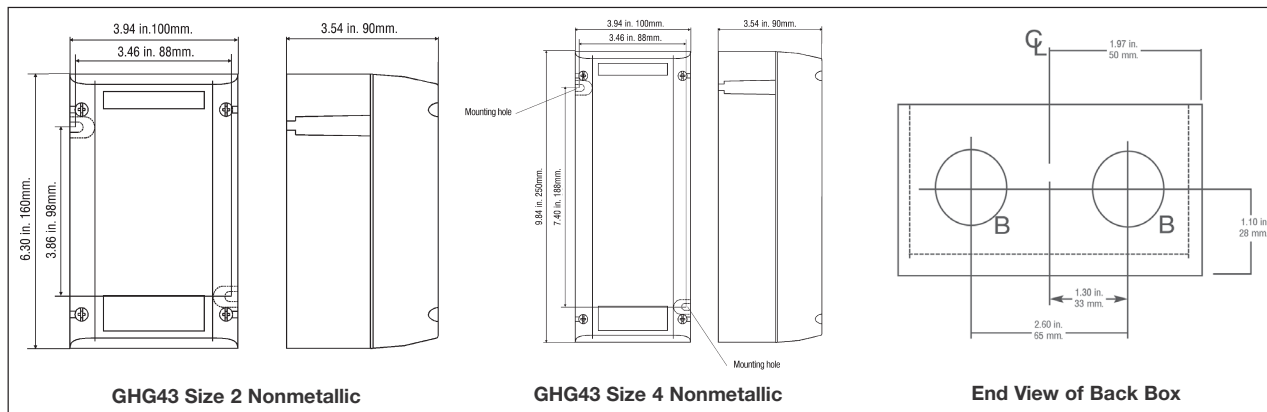
**Z**  
**Code F**  
Padlocking Cover For  
Emergency Stop Pushbutton  
With Bolt & Chain  
Not permitted in IEC hazardous  
locations.

Marking Guide For Pushbuttons  
Special Text

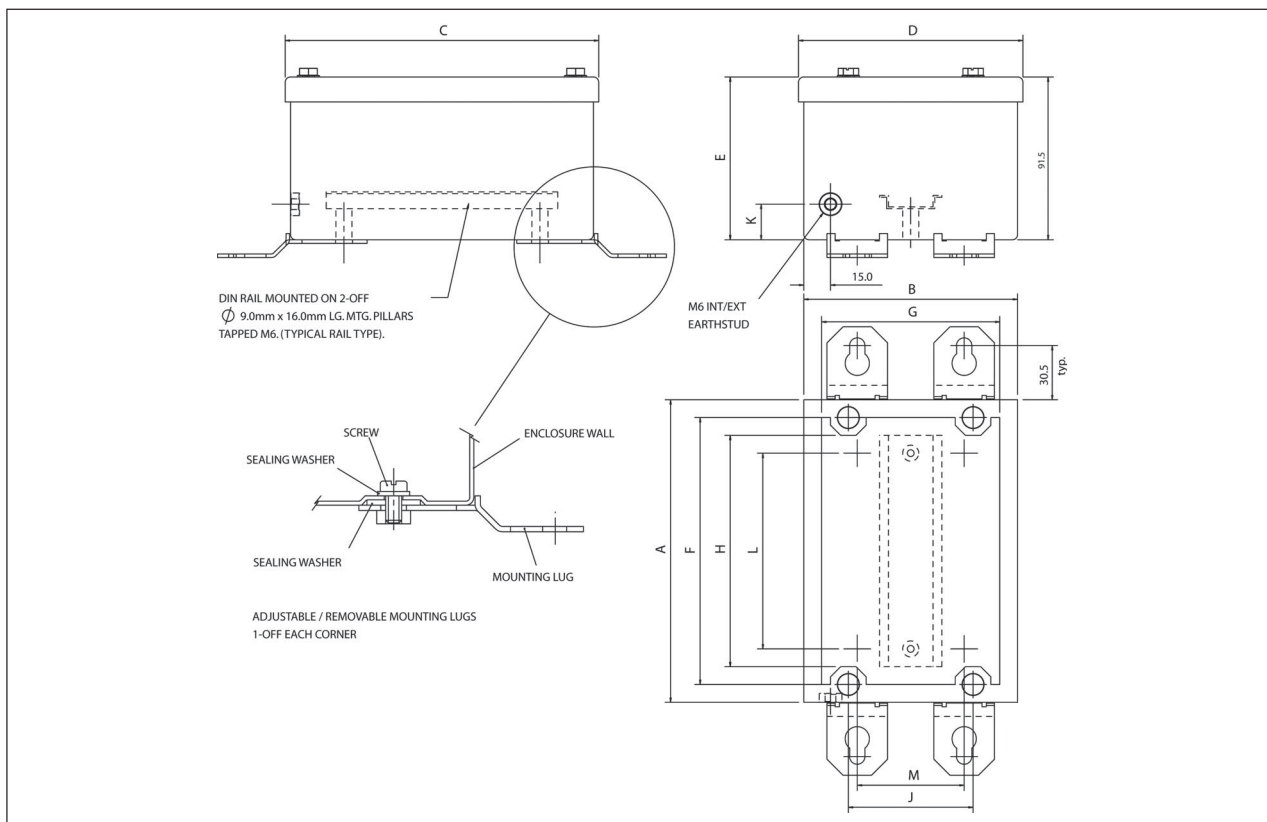
| Marking Required | Standard Abbreviation | Actual Marking on Disc |
|------------------|-----------------------|------------------------|
| Acknowledge      | AK                    | ACK                    |
| Alarm            | AM                    | ALARM                  |
| Automatic        | AU                    | AUTO                   |
| Close            | CL                    | CLOSE                  |
| Down             | DN                    | DOWN                   |
| Fast             | FS                    | FAST                   |
| Forward          | FW                    | FWD                    |
| Hand             | HN                    | HAND                   |
| High             | HI                    | HIGH                   |
| In               | IN                    | IN                     |
| Jog              | JG                    | JOG                    |
| Local            | LC                    | LOCAL                  |
| Lower            | LO                    | LOWER                  |
| Maintain         | MT                    | MAINT                  |
| Manual           | MN                    | MANUAL                 |
| Normal           | NR                    | NORMAL                 |
| Off              | OF                    | OFF                    |
| On               | ON                    | ON                     |
| Open             | OP                    | OPEN                   |
| Out              | OT                    | OUT                    |
| Raise            | RA                    | RAISE                  |
| Remote           | RM                    | REMOTE                 |
| Reset            | RS                    | RESET                  |
| Reverse          | RV                    | REV                    |
| Run              | RN                    | RUN                    |
| Slow             | SL                    | SLOW                   |
| Test             | TT                    | TEST                   |
| Trip             | TP                    | TRIP                   |
| Up               | UP                    | UP                     |

**Nonmetallic or 316L Stainless Steel  
Corrosion Resistant**

### GHG43 Nonmetallic Control Stations



### GHG43 Stainless Steel Control Stations



#### Box Type

#### Dimension (inches)

|                            | A     | B    | C     | D    | E    | F    | G    | H    | J    | K    | L    | M    |
|----------------------------|-------|------|-------|------|------|------|------|------|------|------|------|------|
| 1 Operator Control Station | 4.72  | 4.72 | 4.96  | 4.96 | 3.60 | 3.94 | 3.94 | 3.15 | 2.76 | 0.79 | 2.36 | 2.36 |
| 2 Operator Control Station | 6.69  | 4.72 | 6.93  | 4.96 | 3.60 | 5.90 | 3.94 | 5.12 | 2.76 | 0.79 | 4.33 | 2.36 |
| 3 Operator Control Station | 8.66  | 4.72 | 8.90  | 4.96 | 3.60 | 7.87 | 3.94 | 7.09 | 2.76 | 0.79 | 6.30 | 2.36 |
| 4 Operator Control Station | 10.63 | 4.72 | 10.87 | 4.96 | 3.60 | 9.84 | 3.94 | 9.06 | 2.76 | 0.79 | 8.27 | 2.36 |

# OAC Series Pushbutton Stations and Heavy Duty Selector Switches

**600 VAC Standard  
Factory Sealed†**

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7ABCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

**4C**

## Applications:

OAC Units are used:

- In areas which are hazardous due to the presence of flammable vapors, gases or highly combustible dusts
- In damp, wet or corrosive locations
- Indoors or outdoors at petroleum refineries, chemical and petrochemical plants and other process industry facilities where similar hazards exist
- In areas which are hazardous due to the presence of acetylene and hydrogen, or gases or vapors of equivalent hazard such as manufactured gas
- In conjunction with magnetic starters or contactors for remote control of motors

## Features:

- Water-shedding construction with female threaded bottom opening and male threaded cover
- Threaded cover is deep dome type, which surrounds the enclosed device
- All enclosures are suitable for hazardous area use
- Pushbutton stations have a guarded rocker type operating handle at the front arranged for padlocking to prevent unauthorized operation
- Selector switches have a lever type operating handle at the top
- Provided with vertical through feed conduit hubs of sizes indicated in the listings
- Units are factory sealed for Cl. I, Div. 1 and 2, Groups B, C, D
- Standard lockout on selector switches. Locks two or three-position switch handle in any position.

## Standard Materials:

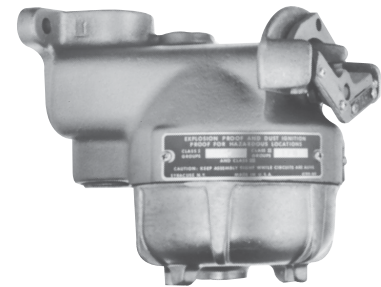
- Bodies – *Feraloy*® iron alloy
- Covers and operating handle – copper-free aluminum
- Operating shafts – stainless steel

## Standard Finishes:

- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

## Certifications and Complies:

- NEC/CEC  
Class I, Division 1 & 2, Groups A, B, C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA/EEMAC: 3, 4, 7ABCD, 9EFG, 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30



## Electrical Rating Ranges:

- Pushbutton stations, and selector switches - Air Break – heavy duty 600VAC maximum

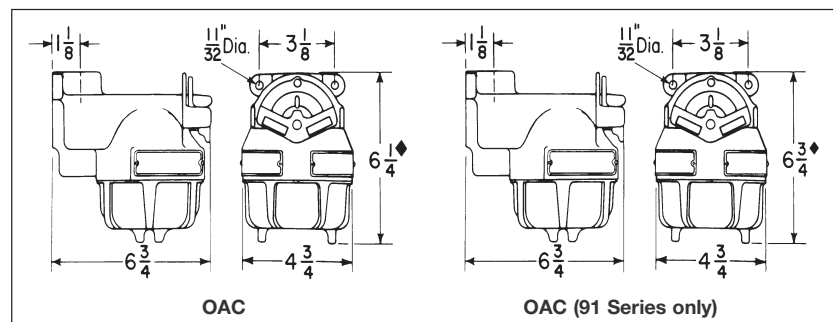
## Options:

The following special options are available from factory by adding suffix to Cat. #:

### Description

| Description                                                             | Suffix  |
|-------------------------------------------------------------------------|---------|
| Back boss drilled and tapped for 3/4" and 1" sizes.....                 | Specify |
| Three-position selector switches with modified operation:               |         |
| Momentary contact clockwise operation, spring return to center,         |         |
| maintained contact counter-clockwise operation.....                     | S634    |
| Momentary contact counter-clockwise operation, spring return to center, |         |
| maintained contact clockwise operation.....                             | S635    |

## Dimensions In Inches\*:



†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D.

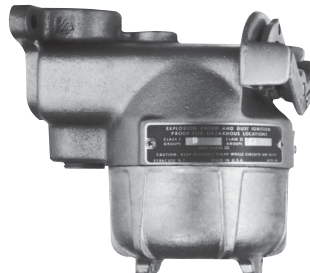
\*Dimensions are approximate, not for construction purposes. For cover removal, add 2 1/2" to dimension.



# 4C OAC Series Pushbutton Stations and Heavy Duty Selector Switches

600 VAC Standard  
Factory Sealed†

Cl. I, Div. 1 & 2, Groups A, B, C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 4, 7ABCD, 9EFG, 12 Watertight



## Ordering Information - Pushbutton Stations

Normal Pos. 1 Circuit Universal 2 Circuits Universal 2 Circuits Universal 2 Circuits\*

Oper.  
Handles

Single Double Single Operating Both Buttons Double

Replacement  
Pushbuttons  
Diagram



| Hub Size | Cat. #    | Cat. #    | Cat. #    | Cat. #    |
|----------|-----------|-----------|-----------|-----------|
| 3/4      | OAC2101 ① | OAC2133 ① | OAC2139 ① | OAC2103 ① |
| 1        | OAC3101 ① | OAC3133 ① | OAC3139 ① | OAC3103 ① |

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|           |       |       |           |
|-----------|-------|-------|-----------|
| START     | OFF   | RESET | LIGHT ON  |
| STOP      | RUN   | TRIP  | HAND      |
| ON        | JOG   | TEST  | AUTOMATIC |
| EMERGENCY | OPEN  | DOWN  | RAISE     |
| FORWARD   | CLOSE | IN    | LOWER     |
| REVERSE   | UP    | OUT   |           |

†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D

\*Two universal contact blocks, must be wired as two circuits, one normally open and one normally closed.

With momentary left handle and maintained right handle. For momentary "START", maintained "STOP" and similar applications.

Normal Pos. 2 Circuit Universal

Diagram



Enclosure with Pushbuttons

| Hub Size | Cat. #    |
|----------|-----------|
| 3/4      | OAC2291 ① |
| 1        | OAC3291 ① |

OAC Series Pushbutton Stations and Heavy Duty Selector Switches

600 VAC Standard  
Factory Sealed†

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7ABCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

4C

Ordering Information - Selector Switches

| Style                          | Position 1 | Position 2 | Position 3 | Replacement Contact Blocks* | Enclosure with Selector Switch |           |
|--------------------------------|------------|------------|------------|-----------------------------|--------------------------------|-----------|
|                                |            |            |            |                             | Hub Size                       | Cat. #    |
| Two-Position, Two-Circuit      | A1         |            |            | ED21                        | 3/4                            | OAC2471 ① |
|                                | A2         |            |            |                             | 1                              | OAC3471 ① |
| Two-Position, Four-Circuit     | A1         |            |            | ED22                        | 3/4                            | OAC2472 ① |
|                                | A2         |            |            |                             | 1                              | OAC3472 ① |
|                                | B1         |            |            |                             |                                |           |
|                                | B2         |            |            |                             |                                |           |
| Three-Position, Two-Circuit ‡  | A1         |            |            | ED21                        | 3/4                            | OAC2473 ① |
|                                | A2         |            |            |                             | 1                              | OAC3473 ① |
| Three-Position, Four-Circuit ‡ | A1         |            |            | ED22                        | 3/4                            | OAC2474 ① |
|                                | A2         |            |            |                             | 1                              | OAC3474 ① |
|                                | B1         |            |            |                             |                                |           |
|                                | B2         |            |            |                             |                                |           |
|                                | A1         |            |            | ED22                        | 3/4                            | OAC2475 ① |
|                                | A2         |            |            |                             | 1                              | OAC3475 ① |
|                                | B1         |            |            |                             |                                |           |
|                                | B2         |            |            |                             |                                |           |



OAC Selector Switches are furnished with pushbutton contact blocks, cam actuated by a maintained contact selector mechanism to operate in the sequences shown in the diagrams below.

4C

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard catalog markings below:

Two-Position

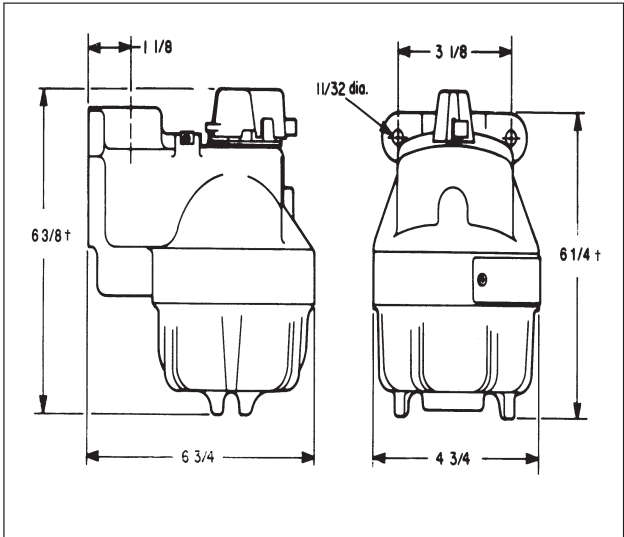
|                  |             |             |
|------------------|-------------|-------------|
| RUN, JOG         | FAST, SLOW  | IN-OUT      |
| HAND, AUTOMATIC  | OPEN, CLOSE | RAISE-LOWER |
| FORWARD, REVERSE | UP, DOWN    | START-STOP  |
|                  | ON, OFF     |             |

Three-Position

|                       |                  |
|-----------------------|------------------|
| RUN, OFF, JOG         | 1, OFF, 2        |
| HAND, OFF, AUTOMATIC  | OPEN, OFF, CLOSE |
| FORWARD, OFF, REVERSE | UP, OFF, DOWN    |
| FAST, OFF, SLOW       |                  |

Dimensions\*

In Inches:



†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D

‡ Suffixes S634 or S635 may be used on these catalog numbers. See page 567 of explanation of options.

\*Dimensions are approximate. Not for construction purposes. For cover removal, add 2 1/2" to dimension.

# 4C Control Station Covers

## Hinged and Open Front



Open Front Cover



Hinged Cover

### Applications:

Added environmental protection for Eaton's Crouse-Hinds control stations is now available from a patented "slip on" series of covers. Easy to install, these enclosures are available in hinged and open front styles, and are ideal for corrosive and adverse areas where product endurance is essential.

#### Secured Access Hinged Cover

- High moisture areas due to weather, steam, or wash down procedures.
- Areas where dirt, dust, mud, sand, etc. interferes with equipment operation.
- Prevention of accidental equipment operation.
- Instances requiring equipment lockout/tagout.

#### Quick Access Open Front Cover

- Areas requiring quick access to control device.
- Areas of high moisture from weather or dripping liquid.
- Prevention of accidental equipment operation.
- Areas with possible damage from bumping or banging.

### Features and Benefits:

- Clear UV stabilized Lexan polycarbonate plastic allows the end-user to see enclosed controls and is strong enough to withstand the rough treatment found in the industrial workplace.
- Downtime due to weather or accidental bumping is eliminated and plant shutdowns caused by inoperable or accidentally operated pushbutton devices are non-existent.
- Lockout/tagout capabilities conform to OSHA requirements and provides increased personnel safety.
- Quick and easy slip on installation requires no tools or interruption of service.
- Hinged cover provides superior sealing through heavy duty neoprene gaskets.
- Colored covers are available (e.g. red for emergency, yellow for fire alarm, etc.).
- Specific chemical-resistant covers available (may not be clear) - consult factory for minimum order quantity.
- Capability to engineer cover to fit any size device - consult factory.

### Hinged Covers

| Single Gang Application            | Cat. #        |
|------------------------------------|---------------|
| EDS(C) and EFD(C) control stations | NC CH1        |
| EFS(C) control stations            | NC CH1 EFS    |
| MC(C) control stations             | NC CH1 MC     |
| FS(C) back box with cover assembly | NC CH1 FS     |
| FD(C) back box with cover assembly | NC CH1 FD     |
| EGF11 and EGF12 (Ground Fault)     | NC CH1 EGF 11 |
| N2S(C) Krydon: 1 & 2 devices       | NC CH1 N2S    |
| N2D(C) Krydon: 1 & 2 devices       | NC CH1 N2D    |
| GHG432 control station             | NC CH1 GHG    |
| Single Gang (Long) Application     | Cat. #        |
| EFD(C) (3 device)                  | NC CH1 3L     |
| N2S(C) Krydon: 3 devices           | NC CH1 N2S 3L |
| N2S(C) Krydon: 4 devices           | NC CH1 N2S 4L |
| Double Gang Application            | Cat. #        |
| EDS(C) control stations            | NC CH2        |
| EDSCM32: 2 gang tandem             | NC CH2L       |
| EDSCM33: 3 gang tandem             | NC CH3L       |
| FS(C) back box with cover          | NC CH2 FS     |
| FD(C) back box with cover          | NC CH2 FD     |
| EDSC378 - 3 gang tandem assembly   | NC CH1 MC3    |

### Open Front Covers

| Single Gang Application            | Cat. #           |
|------------------------------------|------------------|
| EDS(C) and EFD(C) control stations | NC CH1 QA        |
| EFS(C) control stations            | NC CH1 EFS QA    |
| MC(C) control stations             | NC CH1 MC QA     |
| FS(C) back box with cover assembly | NC CH1 FS QA     |
| FD(C) back box with cover assembly | NC CH1 FD QA     |
| EGF11 and EGF12 (Ground Fault)     | NC CH1 EGF QA    |
| N2S(C) Krydon: 2 device assembly   | NC CH1 N2S QA    |
| N2D(C) Krydon: 3 device assembly   | NC CH1 N2D QA    |
| Single Gang (Long) Application     | Cat. #           |
| EFD(C): 3 device control stations  | NC CH1 3L QA     |
| N2S(C) Krydon: 3 device assembly   | NC CH1 N2S 3L QA |
| N2S(C) Krydon: 4 device assembly   | NC CH1 N2S 4L QA |
| Double Gang Application            | Cat. #           |
| EDS(C) control stations            | NC CH2 QA        |
| EDSCM32: 2 gang tandem             | NC CH2L QA       |
| EDSCM 33: 3 gang tandem            | NC CH3L QA       |
| FS(C) back box with cover assembly | NC CH2 FS QA     |
| FD(C) back box with cover assembly | NC CH2 FD QA     |

Custom covers can be supplied but must be accompanied by either a sample of the device to be covered or a copy of a drawing with all actual measurements of the device to be covered. Covers can also be color-coded. Consult factory.

**Crouse-Hinds**  
by **E.T.N**

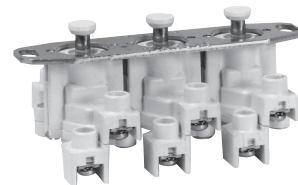
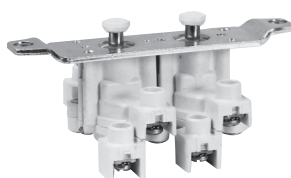
# Replacements for Pushbutton and Selector Switch Control Stations

4C

600 VAC Heavy Duty

## ED Series Pushbutton Contacts (for control stations built in 1996 or earlier)

Complete with Mounting Strap and Hardware



### Where Used

MC pushbutton stations and selector switches  
OAC pushbutton stations and selector switches  
EWC pushbutton stations  
EMP selector switches  
DSD962 pushbutton cover

1 Circuit  
Universal



Cat. #

ED11

ED21

-

ED38

-

2 Circuits  
Universal



Cat. #

ED12†

ED22†

ED32†

-

-

2 Circuits  
1 Open - A  
1 Closed - B



Cat. #

ED12†

ED22†

ED32†

-

-

3 Circuits  
Universal



Cat. #

-

-

-

ED13

-

## FlexStation Series Pushbutton Contacts (for control stations built in 1997 or later)

Contact Block without Mounting Strap



### Where Used

EDS and EFS pushbutton stations and selector switches  
DSD962 pushbutton cover

1 Circuit  
Universal



Cat. #

ESWP126

-

2 Circuits  
Universal



Cat. #

ESWP126 (2)

-

2 Circuits  
1 Open - A  
1 Closed - B

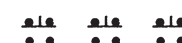


Cat. #

ESWP126 (2)

-

3 Circuits  
Universal



Cat. #

-

ESWP126 (3)

## Contact Ratings

| Volts                          | Max. Current<br>(Amperes) |       | Voltamperes |       | Continuous<br>Current<br>(Amperes) |
|--------------------------------|---------------------------|-------|-------------|-------|------------------------------------|
|                                | Make                      | Break | Make        | Break |                                    |
| 600 VAC Heavy Duty (NEMA A600) |                           |       |             |       |                                    |
| 120                            | 60                        | 6.0   | 7200        | 720   | 10                                 |
| 240                            | 30                        | 3.0   | 7200        | 720   | 10                                 |
| 480                            | 15                        | 1.5   | 7200        | 720   | 10                                 |
| 600                            | 12                        | 1.2   | 7200        | 720   | 10                                 |
| Direct Current (NEMA P150)     |                           |       |             |       |                                    |
| 125                            | 1.1                       | 1.1   | 138         | 138   | 5                                  |

## External Operating Buttons



CF859



CF705

### Where Used

MC, EFS, and EFD – current design with nylon guards

EMPS019, EMP019, EMPS029 and EMP029 – single operator FS, EFS, and EFD – previous design with aluminum guards

### Colors Available

Red, Green, Black

Red, Green, Black

### Cat. #

CF859 K1 ①

CF705-K1 ①

① If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

|       |     |       |           |
|-------|-----|-------|-----------|
| START | OFF | RESET | LIGHT ON  |
| STOP  | RUN | TRIP  | HAND      |
| ON    | JOG | TEST  | AUTOMATIC |

|           |       |      |       |
|-----------|-------|------|-------|
| EMERGENCY | OPEN  | DOWN | RAISE |
| FORWARD   | CLOSE | IN   | LOWER |
| REVERSE   | UP    | OUT  |       |

Note: CF859-K1 and CF705-K1 come with 5 buttons.

† Two universal contact blocks, must be wired as two circuits, with one normally open and one normally closed.

‡ Use CF705-K1 for DEV11 and DEV12. To order DL legend plates see page 516 for markings.

**Crouse-Hinds**

by **E•T•N**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

571



| Description                                             | Page No.          |
|---------------------------------------------------------|-------------------|
| <b>Controls for Bulk Solids Handling</b>                |                   |
| AFA / AFAX Conveyor Alignment Switches                  | see page 589      |
| AFU / AFUX Conveyor Control Safety Switches             | see page 588      |
| <b>Custom Control Panels</b>                            |                   |
| EJB Series                                              | see pages 576–581 |
| <b>Ground Fault Control Stations</b>                    |                   |
| EGF Series                                              | see page 595      |
| <b>Grounding Indication / Control</b>                   |                   |
| EGL Series                                              | see page 587      |
| <b>Lighting Contactors</b>                              |                   |
| XLC Series                                              | see pages 574–575 |
| <b>Mine Signal Switches</b>                             |                   |
| AFU Series                                              | see page 590      |
| <b>Pendant Pushbutton Stations</b>                      |                   |
| FLEXITITE™ Series                                       | see pages 593–594 |
| FLEXITITE™ D2X Series                                   | see pages 591–592 |
| <b>Pushbuttons, Pilot Lights, and Selector Switches</b> |                   |
| EMP Series                                              | see page 584      |
| <b>Timers</b>                                           |                   |
| DSD-TS Series                                           | see page 596      |

Explosionproof lighting contactors provide efficient use of power, greater utilization of daylight, and automated control in the most extreme harsh and hazardous locations while extending lighting lifetime.

## Applications:

- Areas requiring safe and efficient variable lighting control
- Areas with hazardous gas, vapors, and dust
- Indoor or outdoor locations in damp, wet, dusty, or corrosive environments

## Features:

- Variable lighting control utilizing manual on/off or automatic settings
- Photocell option provides maximum utilization of sunlight for energy conservation
- Modular lighting contactor design provides flexibility to add future power poles
- Lighting contacts are electrically held for superior performance
- Power poles convert from NO to NC with a simple 180° turn

### Standard configuration includes:

- EJB121208 enclosure with mounting plate, hinges, and breather/drain
- Captive, triple lead, quick release, hex head stainless steel bolts with spring-loaded action
- Tap-in mounting feet offer simple and secure installation and are easily replaceable
- Special neoprene cover gasket provides a watertight seal to meet NEMA requirements
- Internal neutral and ground bar
- Electrically held modular lighting contactor
- Two 3/4" NPT control conduit entries - one on top and one on bottom
- Twelve 1" NPT power conduit entries - six on top and six on bottom
- DSL nameplates are standard for all operator positions and Lamacoid nameplates are available upon request

## Certifications and Compliances:

- Class I, Divisions 1 & 2, Groups B, C, D
- Class I, Zones 1 & 2
- Class II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- NEMA 3, 7BCD, 9EFG
- UL Standard: 1203
- cUL to CSA Standard C22.2 No. 30
- Ex d IIB + H<sub>2</sub>

## Standard Materials:

- Body and cover – copper-free aluminum
- Gasket – neoprene
- Cover bolts – stainless steel
- Hinges – stainless steel

## Electrical Ratings\*:

- Voltage: 120V
- Amperage: 30A
- Number of Poles: 1-12 standard

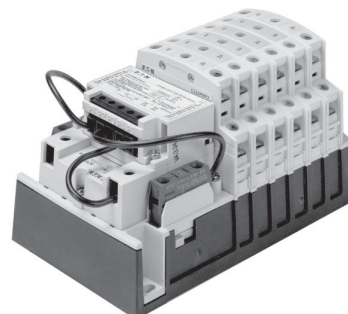
## Options:

| Description                          | Suffix |
|--------------------------------------|--------|
| Terminal block**                     | TB     |
| Timer**                              | TR     |
| EV2IH20 photocell (120V)             | PC1    |
| EV2IH208 277 photocell (208-277V)*   | PC2    |
| Epoxy finish (external)              | S752   |
| Epoxy finish (internal and external) | S753   |
| Lamacoid Nameplate                   | LID    |
| Heater                               | R11    |

## Ordering Information:

Amps = 30A

| Poles | 120V     |
|-------|----------|
| 2     | XLC30A2  |
| 3     | XLC30A3  |
| 4     | XLC30A4  |
| 5     | XLC30A5  |
| 6     | XLC30A6  |
| 7     | XLC30A7  |
| 8     | XLC30A8  |
| 9     | XLC30A9  |
| 10    | XLC30A10 |
| 11    | XLC30A11 |
| 12    | XLC30A12 |



Example of lighting contactor within the XLC solution



## EMP Operator Positions:

|    |    |
|----|----|
| 1. | 2. |
| 3. | 4. |

Additional EMP operators available, see page 581

Photocells are shipped separate for field installation.

\*Additional configurations are available upon request. Please contact Customer Service for details.

\*\*Timer and/or terminal block may require larger enclosure.



XLC Explosionproof  
Lighting Contactors

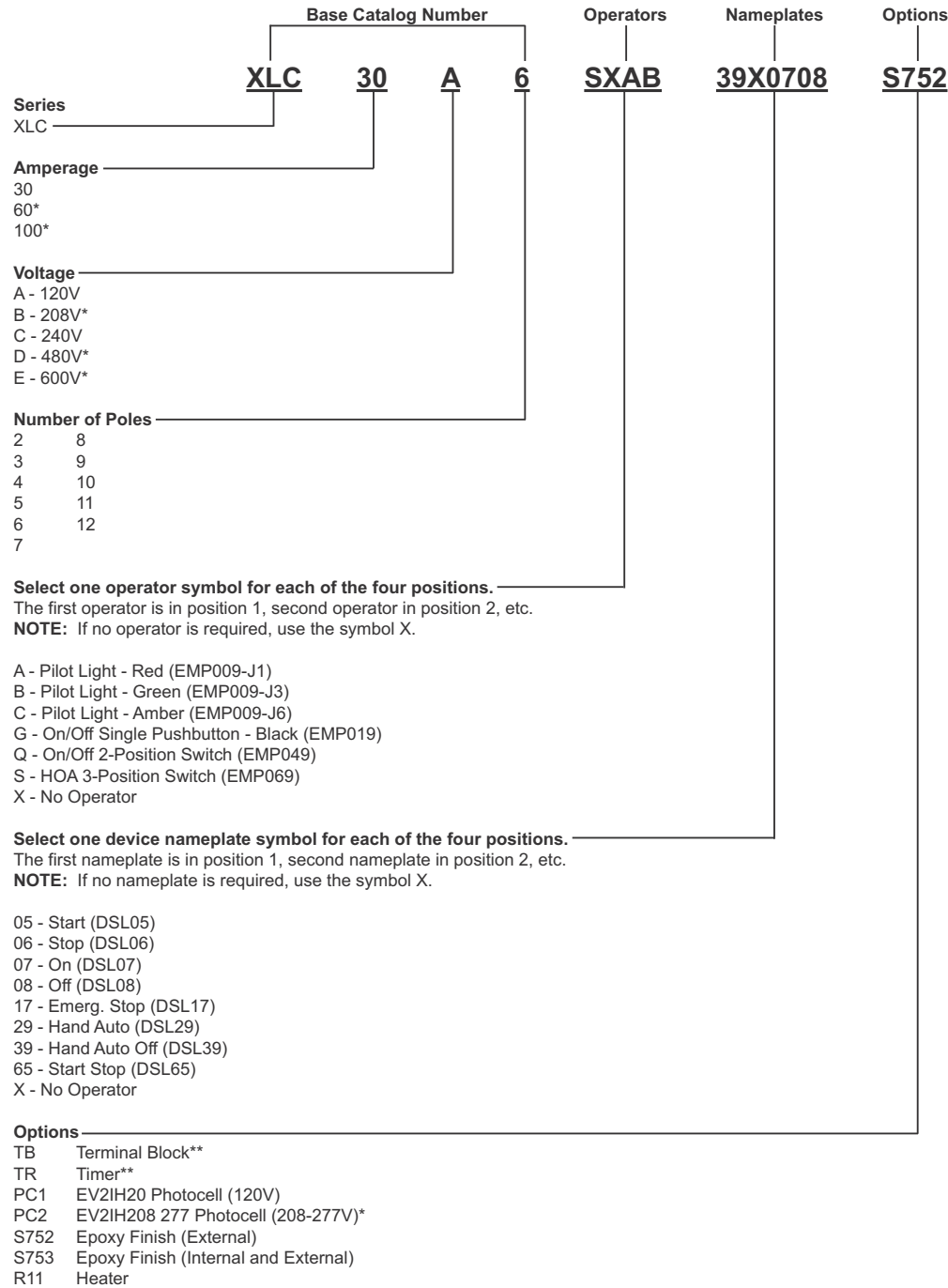
Cl. I, Div. 1 & 2, Groups B, C, D      NEMA 3, 7BCD, 9EFG  
Cl. I, Zones 1 & 2  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III

5C

Catalog Number Example: XLC30A6SXAB39X0708

XLC Lighting Contactor, 30A, 120V, 6 pole, HOA 3-position switch in position 1, no operator in position 2, red pilot light in position 3, green pilot light in position 4, HOA DSL in position 1, no DSL in position 2, ON DSL in position 3, OFF DSL in position 4.

Catalog Numbering Example:



Additional EMP operators available, see page 581  
Photocells are shipped separate for field installation.  
\*Additional configurations are available upon request. Please contact Customer Service for details.  
\*\*Timer and/or terminal block may require larger enclosure.

5C

## 5C EJB Custom-Built Control Panels

**Globally Certified—Individually Customized**

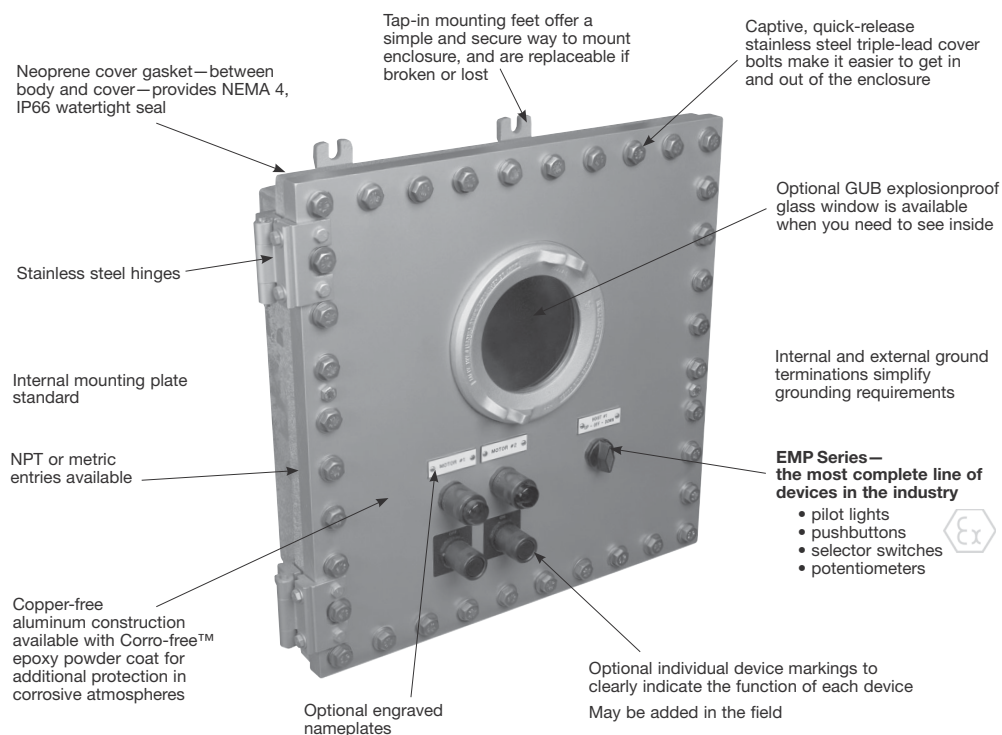
Cl. I, Div. 1 & 2, Groups B\*, C, D    UL and cUL approved  
Cl. I, Zones 1 & 2    Ex d IIB + H<sub>2</sub> T6  
Cl. II, Div. 1, Groups E, F, G    Certified to ATEX Directive†  
Cl. II, Div. 2, Groups F, G    NEMA 3, 7B\*CD, 9EFG  
Cl. III    IP66

The following pages will assist you in choosing the combination of features suited to your needs and requirements. The easy, five-step process will take you through the specification of cover openings, specifying devices, drilled and tapped conduit openings, device locations, and legend and nameplate selection.

After filling out your separate order form for each panel, fax it to your local Eaton's Crouse-Hinds Distributor. Please consult the factory for alternatives not detailed in these pages, such as other conduit arrangements, terminal blocks, or circuit breaker operating handles.

### Features:

- The foundation of the Custom-Built Control Panel is our tried and tested copper-free aluminum EJB enclosure. This corrosion resistant, heavy-duty enclosure features bolted construction, stainless steel hinges, and flexible tap-in mounting feet.



### Certifications and Compliances:

#### EJB Custom Control Panels

- NEC/CEC:
  - Class I, Divisions 1 & 2, Groups B\*, C and D
  - Class I, Zones 1 & 2
  - Class II, Division 1, Groups E, F and G
  - Class II, Division 2, Groups F and G
  - Class III
- NEMA: 3, 4, 7B\*CD, 9EFG
- cUL to CSA Standard C22.2 No. 30—C22.2 No. 25 Cl. II (E, F, G)
- Ex d IIB + H<sub>2</sub> T6
- UL Standard 1203
- IP66
- Certified to the ATEX Directive when ordered with -ATEX suffix.
- Custom Control Panel is component certified only. For assembly certification, please consult factory.

\*Groups C and D only when ordered with GUB window.

† Certified to the ATEX Directive when ordered with ATEX suffix.

### ATEX Certifications

- EJB Enclosure with Conduit Entries & Device Holes  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS08ATEX15797U
- EMP Devices  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS07ATEX15652U
- GUB0108 ATEX Window  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS07ATEX15638U
- ECD Breather/Drain  
 II 2 G Ex d IIB + H<sub>2</sub>    Certificate #: ITS07ATEX15639U

## Globally Certified—Individually Customized

Ordering and receiving Eaton's Crouse-Hinds EJB Custom-Built Control Panels is now easier and faster than ever. Follow the steps below, fill out a separate order form for each panel, and fax it to your local Eaton's Crouse-Hinds Distributor. It's as simple as that!

## Easy Five Step Ordering Process:

- 1 Specify cover openings and devices.
- 2 Specify conduit openings.
- 3 Determine device arrangement.
- 4 Specify device location.
- 5 Specify legend and nameplates.

## Step 1

## Specify the openings required for the cover of the enclosure.

Indicate in Section 1 of the order form the combination of devices, openings without devices, and windows required.

## Total the number of device openings required based on the devices, openings and windows specified in Section 1.

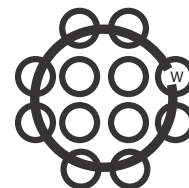
Using Table 1, you can determine the smallest size enclosure required based upon the total number of devices/openings and the number of devices a window requires. (NOTE: The actual size of your custom panel enclosure may change based on the number and size of your entry requirements.)

TABLE 1

DEVICE AND WINDOW INFORMATION

| Total # of Device Openings Available |   | Device Layout |   |   | EJB Enclosure Catalog Number |
|--------------------------------------|---|---------------|---|---|------------------------------|
| 9                                    | = | 3             | X | 3 | EJB100806                    |
| 16                                   | = | 4             | X | 4 | EJB121204                    |
| 16                                   | = | 4             | X | 4 | EJB121206                    |
| 16                                   | = | 4             | X | 4 | EJB121208                    |
| 36                                   | = | 6             | X | 6 | EJB161606                    |
| 36                                   | = | 6             | X | 6 | EJB161608                    |
| 24                                   | = | 6             | X | 4 | EJB181206                    |
| 24                                   | = | 6             | X | 4 | EJB181208                    |
| 36                                   | = | 9             | X | 4 | EJB241208                    |
| 36                                   | = | 9             | X | 4 | EJB241210                    |
| 54                                   | = | 9             | X | 6 | EJB241808                    |
| 54                                   | = | 9             | X | 6 | EJB241810                    |
| 81                                   | = | 9             | X | 9 | EJB242408                    |
| 81                                   | = | 9             | X | 9 | EJB242410                    |
| 52                                   | = | 13            | X | 4 | EJB361208                    |
| 78                                   | = | 13            | X | 6 | EJB361808                    |
| 78                                   | = | 13            | X | 6 | EJB361810                    |
| 117                                  | = | 13            | X | 9 | EJB362408                    |

Requires same area as 12 devices.  
May be installed in all boxes.



GUB0108—Symbol W  
4-3/4" dia. viewing area

## SIZE REQUIREMENTS

| EJB Size         | Max. No. Windows |
|------------------|------------------|
| 121204 to 181208 | 1                |
| 241208 to 362408 | 2                |

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## Step 2

**Specify the number, size and location of conduit openings required on the sides, top and bottom of the enclosure body using the information in Tables 2, 3, and 4.**

Refer to Table 2 to determine if the enclosure selected in Step 1 will accommodate the required conduit openings.  
From Table 3, determine the symbol(s) that correspond with the required conduit openings.

**Place these symbols in the desired positions using the conduit arrangement diagrams in Table 4.**

Any combination of the four arrangement diagrams may be used per side and all positions on a side with openings must have a symbol. The side number (1, 2, 3 or 4) must precede the conduit opening(s) symbols for the respective side. When a side of the enclosure does not require any conduit openings, the side number is omitted from the catalog number.

**Enter the complete catalog number, including conduit opening designations, in Section 2 of the order form. Indicate on which side the hinges should be mounted. Check boxes in Section 2 for options desired.**

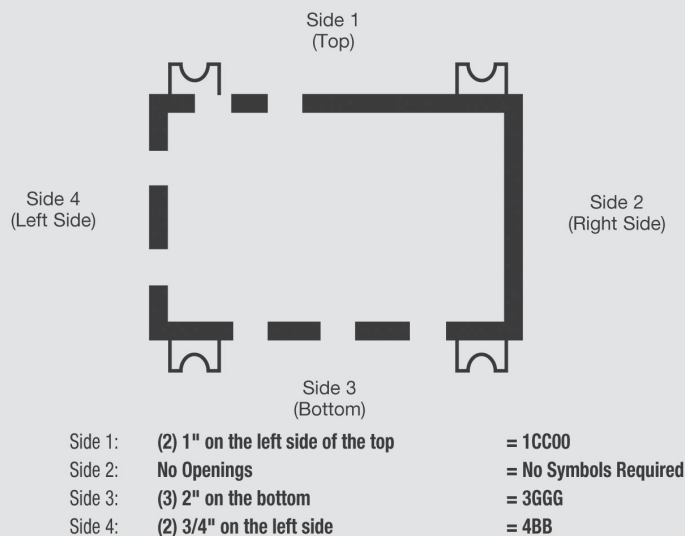
## Example:

In Step 1, customer selects an EJB161606 based on the number of devices/openings specified (See Section 1 of sample order form). The following conduit openings are required: (2) 1" on the left side of the top; no openings on the right side; (3) 2" on the bottom; and (2) 3/4" on the left side.

Table 2 indicates the maximum size allowed for three conduit openings in an EJB161606 is 2-1/2". Therefore, an EJB161606 would be suitable.

Table 3 indicates a 3/4" opening is symbol B, a 1" opening is symbol C, a 2" opening is symbol G and no opening is a 0.

Using the conduit arrangement diagrams in Table 4, place the symbols for the desired openings in the appropriate positions. Remember, any combination of the four arrangement diagrams may be used and all positions on a side with openings must have a symbol even if no opening is required in a particular position.



Complete catalog number is: **EJB161606- 1CC003GGG4BB**. Enter the completed catalog number, including conduit opening designations, in Section 2 of the order form. Indicate on which side the hinges should be mounted.

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TABLE 2

CONDUIT ARRANGEMENTS

| CAT #                       | Maximum Trade Size and Number of Openings |       |       |       |            |       |       |       | Spacing Dimensions |        |         |        |        |        |        |  |
|-----------------------------|-------------------------------------------|-------|-------|-------|------------|-------|-------|-------|--------------------|--------|---------|--------|--------|--------|--------|--|
|                             | Top and Bottom (bb)                       |       |       |       | Sides (aa) |       |       |       |                    |        |         |        |        |        |        |  |
|                             | 1                                         | 2     | 3     | 4     | 1          | 2     | 3     | 4     | S                  | T      | U       | V      | W      | X      | Y      |  |
| Drilled and Tapped Openings |                                           |       |       |       |            |       |       |       |                    |        |         |        |        |        |        |  |
| EJB100806                   | 3-1/2                                     | 3     | 1-1/2 | 1-1/4 | 3-1/2      | 2-1/2 | 1-1/4 | 3/4   | 3-3/4              | 2-5/16 | 1-15/16 | 2-3/4  | 2-1/2  | 2-1/2  | 1-3/4  |  |
| EJB121204                   | 1-1/2                                     | 1-1/2 | 1-1/2 | 1-1/4 | 1-1/2      | 1-1/2 | 1-1/2 | 1-1/4 | 3                  | 2-1/4  | 2-1/4   | 3-5/8  | 3-5/8  | 3-1/16 | 3-1/16 |  |
| EJB121206                   | 3-1/2                                     | 3-1/2 | 1-1/2 | 1-1/4 | 3-1/2      | 3-1/2 | 1-1/2 | 1-1/4 | 3-3/4              | 3      | 3       | 3-5/8  | 3-5/8  | 3-1/16 | 3-1/16 |  |
| EJB121208                   | 5                                         | 3-1/2 | 1-1/2 | 1-1/4 | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 4-3/4              | 3      | 3       | 3-5/8  | 3-5/8  | 3-1/16 | 3-1/16 |  |
| EJB161606                   | 3-1/2                                     | 3-1/2 | 2-1/2 | 2     | 3-1/2      | 3-1/2 | 2-1/2 | 2     | 3-3/4              | 3      | 3       | 4-5/8  | 4-5/8  | 4-3/16 | 4-3/16 |  |
| EJB161608                   | 5                                         | 5     | 3     | 2     | 5          | 5     | 3     | 2     | 4-3/4              | 3-1/4  | 3-1/4   | 6      | 4-5/8  | 4-3/16 | 4-3/16 |  |
| EJB181206                   | 3-1/2                                     | 3-1/2 | 3-1/2 | 2-1/2 | 3-1/2      | 3-1/2 | 1-1/2 | 1-1/4 | 3-3/4              | 3      | 3       | 6      | 3-5/8  | 4-5/8  | 3-1/16 |  |
| EJB181208                   | 5                                         | 5     | 3-1/2 | 2-1/2 | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 4-3/4              | 4-3/16 | 3       | 6      | 3-5/8  | 4-5/8  | 3-1/16 |  |
| EJB241208                   | 5                                         | 5     | 5     | 3-1/2 | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 5-1/8              | 4-3/16 | 3       | 8-7/16 | 3-5/8  | 6      | 3-1/16 |  |
| EJB241210                   | 6                                         | 6     | 5     | 3-1/2 | 6          | 3-1/2 | 1-1/2 | 1-1/4 | 6-1/8              | 4-3/4  | 3       | 8-7/16 | 3-5/8  | 6      | 3-1/16 |  |
| EJB241808                   | 5                                         | 5     | 5     | 3-1/2 | 5          | 5     | 3-1/2 | 2-1/2 | 5-1/4              | 4-3/16 | 4-3/16  | 8-7/16 | 6      | 6      | 4-5/8  |  |
| EJB241810                   | 6                                         | 6     | 5     | 3-1/2 | 6          | 6     | 3-1/2 | 2-1/2 | 6-1/4              | 4-3/4  | 4-3/4   | 8-7/16 | 6      | 6      | 4-5/8  |  |
| EJB242408                   | 5                                         | 5     | 5     | 3-1/2 | 5          | 5     | 5     | 3-1/2 | 5-3/8              | 4-3/16 | 4-3/16  | 8-7/16 | 8-7/16 | 6      | 6      |  |
| EJB242410                   | 6                                         | 6     | 5     | 3-1/2 | 6          | 6     | 5     | 3-1/2 | 6-3/8              | 4-3/4  | 4-3/4   | 8-7/16 | 8-7/16 | 6      | 6      |  |
| EJB361208                   | 5                                         | 5     | 5     | 5     | 5          | 3-1/2 | 1-1/2 | 1-1/4 | 4-3/4              | 4-7/16 | 3       | 8-7/16 | 3-5/8  | 8-7/16 | 3-1/16 |  |
| EJB361808                   | 5                                         | 5     | 5     | 5     | 5          | 5     | 3-1/2 | 2-1/2 | 5-1/2              | 4-7/16 | 4-7/16  | 8-7/16 | 6      | 8-7/16 | 4-5/8  |  |
| EJB361810                   | 6                                         | 6     | 5     | 5     | 6          | 6     | 3-1/2 | 2-1/2 | 6-1/2              | 4-3/4  | 4-3/4   | 8-7/16 | 6      | 8-7/16 | 4-5/8  |  |
| EJB362408                   | 5                                         | 5     | 5     | 5     | 5          | 5     | 5     | 3-1/2 | 6                  | 4-3/16 | 4-3/16  | 8-7/16 | 8-7/16 | 8-7/16 | 6      |  |

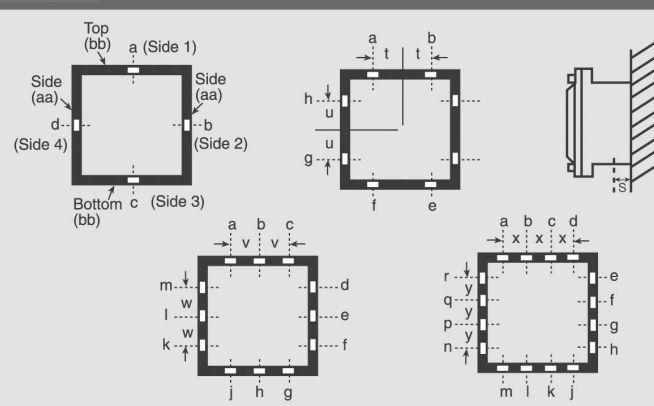
TABLE 3

SYMBOLS FOR OPENINGS

| NPT Conduit Size | Drilled & Tapped Hole Symbol | Metric Openings | Drilled & Tapped Hole Symbol |
|------------------|------------------------------|-----------------|------------------------------|
| 1/2              | A                            | M16             | AM                           |
| 3/4              | B                            | M20             | BM                           |
| 1                | C                            | M25             | CM                           |
| 1-1/4            | E                            | M32             | EM                           |
| 1-1/2            | F                            | M40             | FM                           |
| 2                | G                            | M50             | GM                           |
| 2-1/2            | H                            | M63             | HM                           |
| 3                | J                            |                 |                              |
| 3-1/2            | K                            |                 |                              |
| 4                | L                            |                 |                              |
| 5                | M                            |                 |                              |
| 6                | N                            |                 |                              |

TABLE 4

CONDUIT ARRANGEMENT DIAGRAMS



## Step 3

Based upon the EJB selected, use Section 3 of the order form and outline the maximum number of columns and rows available (from Table 1) beginning in the upper left corner. Fill in the length of each side in the space provided.

Note that the left side will be hinged unless otherwise specified in Section 2. In our example, an EJB161606 was selected and according to Table 1, a total of 36 device spaces are available (6 columns and 6 rows). See sample order form.

## Step 4

Place the appropriate letter symbol from Section 1 of the order form in the position you desire the devices or openings to be located. If a window is required, outline the position and number of spaces the window will occupy and place the symbol of the window (w) in the center.

Note that 2 windows per enclosure can be used. If more windows are required contact factory. (See appropriate window information in the sample order form)

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## Step 5

Indicate the desired device marking (DSL legend plate) or engraved plate for each device or window in Section 4 of the order form.

Engraved plates will be located above the device or window and are white letters on a black background. If an engraved plate is desired, fill in desired wording on engraved plate (up to 2 lines) on Section 4 of order form. If a device marking is required on EMP device, insert the DSL catalog number from those listed below (Table 5) on Section 4 of order form under column labeled "Device Marking." Be sure to specify the row and column location of the EMP device being marked. See sample order form.

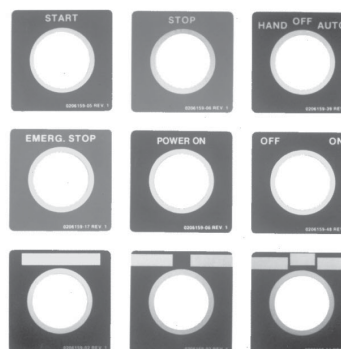
That's it. *It's that simple.* Now fax the order form to your local Eaton's Crouse-Hinds Distributor.

TABLE 5

LEGEND PLATE SELECTOR CHART

Use the charts below to select the appropriate legend plate(s) for your application. Markings shown in **bold print** are etched; all others are stamped.

| Single Function Legend Plates |        | Double Function Legend Plates |        | Triple Function Legend Plates                                                        |              |
|-------------------------------|--------|-------------------------------|--------|--------------------------------------------------------------------------------------|--------------|
| Marking                       | Cat #. | Marking                       | Cat #. | Marking                                                                              | Cat #.       |
| Automatic                     | DSL16  | Blank with 2 fields           | DSL03  | Auto-Off-Hand                                                                        | DSL49        |
| Blank                         | DSL01  | <b>For-Rev</b>                | DSL30  | Blank with 3 fields                                                                  | DSL04        |
| Blank with single field       | DSL02  | Hand-Auto                     | DSL29  | Fast-Off-Slow                                                                        | DSL41        |
| <b>Close</b>                  | DSL21  | In-Out                        | DSL35  | <b>For-Off-Rev</b>                                                                   | DSL40        |
| <b>Down</b>                   | DSL23  | <b>Off-On</b>                 | DSL48  | <b>Hand-Off-Auto</b>                                                                 | <b>DSL39</b> |
| <b>Emerg. Stop</b>            | DSL17  | <b>Open-Close</b>             | DSL32  | <b>Run-Off-Jog</b>                                                                   | <b>DSL38</b> |
| Fast                          | DSL46  | Raise-Lower                   | DSL36  | <b>Open-Off-Close</b>                                                                | DSL43        |
| Forward                       | DSL18  | <b>Run-Jog</b>                | DSL28  | Raise-Off-Lower                                                                      | DSL87        |
| Hand                          | DSL15  | Safe-Run                      | DSL86  | Slow-Off-Fast                                                                        | DSL88        |
| In                            | DSL24  | Start-Stop                    | DSL37  | Up-Off-Down                                                                          | DSL44        |
| Jog                           | DSL10  | Slow-Fast                     | DSL65  | 1-Off-2                                                                              | DSL42        |
| Lower                         | DSL27  | <b>Up-Down</b>                | DSL33  | Note: Background color for all legend plates is black with the following exceptions: |              |
| <b>On</b>                     | DSL07  |                               |        |                                                                                      |              |
| <b>Off</b>                    | DSL08  |                               |        |                                                                                      |              |
| <b>Open</b>                   | DSL20  |                               |        |                                                                                      |              |
| Out                           | DSL25  |                               |        |                                                                                      |              |
| Power On                      | DSL14  |                               |        | Marking                                                                              | Plate Color  |
| Raise                         | DSL26  |                               |        | Start                                                                                | Green        |
| Reset                         | DSL12  |                               |        | Stop                                                                                 | Red          |
| Reverse                       | DSL19  |                               |        | Emerg. Stop                                                                          | Red          |
| Run                           | DSL09  |                               |        |                                                                                      |              |
| <b>Safe</b>                   | DSL85  |                               |        |                                                                                      |              |
| Slow                          | DSL47  |                               |        |                                                                                      |              |
| <b>Start</b>                  | DSL05  |                               |        |                                                                                      |              |
| <b>Stop</b>                   | DSL06  |                               |        |                                                                                      |              |
| <b>Test</b>                   | DSL13  |                               |        |                                                                                      |              |
| Trip                          | DSL11  |                               |        |                                                                                      |              |
| <b>Up</b>                     | DSL22  |                               |        |                                                                                      |              |



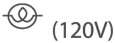


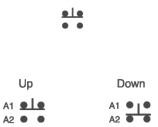
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Please photocopy and fax all pages of order form (Sections 1-4) to your local Eaton’s Crouse-Hinds Distributor.

Section 1: EMP Style Operators—UL, cULus and ATEX

Number of Devices: Indicate the Number of Devices, Openings Without Devices and Window(s) Required.

| Pilot Lights       |                                                                                   |        |          |
|--------------------|-----------------------------------------------------------------------------------|--------|----------|
|                    | Diagram                                                                           | Symbol | Quantity |
| EMP009-J1 (Red)    |  | A      | _____    |
| EMP009-J1-LED      |                                                                                   | A1     | _____    |
| EMP0090-J1         |                                                                                   | A2     | _____    |
| EMP0098-J1         |                                                                                   | A4     | _____    |
| EMP009-J3 (Green)  |                                                                                   | B      | _____    |
| EMP009-J3-LED      |                                                                                   | B1     | _____    |
| EMP0090-J3         |                                                                                   | B2     | _____    |
| EMP0098-J3         |                                                                                   | B4     | _____    |
| EMP009-J6 (Amber)  |                                                                                   | C      | _____    |
| EMP009-J6-LED      |                                                                                   | C1     | _____    |
| EMP0090-J6         |                                                                                   | C2     | _____    |
| EMP0098-J6         |                                                                                   | C4     | _____    |
| EMP009-J10 (Clear) |                                                                                   | E      | _____    |
| EMP0090-J10        |                                                                                   | E2     | _____    |
| EMP0098-J10        |                                                                                   | E4     | _____    |
| EMP009-J11 (Blue)  |                                                                                   | F      | _____    |
| EMP0090-J11        |                                                                                   | F2     | _____    |
| EMP0098-J11        |                                                                                   | F4     | _____    |

| Pushbuttons—Single Pushbutton |                                                                                     |        |          |
|-------------------------------|-------------------------------------------------------------------------------------|--------|----------|
|                               | Diagram                                                                             | Symbol | Quantity |
| EMP019 (Black)                |  | G      | _____    |
| EMP019 (Red)                  |                                                                                     | H      | _____    |
| EMP019 (Green)                |                                                                                     | J      | _____    |
| EMP098 (Red)                  |                                                                                     | K      | _____    |

| Pushbuttons—Double Pushbutton, Single Operator |                                                                                     |        |          |
|------------------------------------------------|-------------------------------------------------------------------------------------|--------|----------|
|                                                | Diagram                                                                             | Symbol | Quantity |
| EMP029 (Black)                                 |  | L      | _____    |
| EMP029 (Red)                                   |                                                                                     | M      | _____    |
| EMP029 (Green)                                 |                                                                                     | N      | _____    |

| Pushbuttons—Double Pushbutton, Double Operator |                                                                                     |        |          |
|------------------------------------------------|-------------------------------------------------------------------------------------|--------|----------|
|                                                | Diagram                                                                             | Symbol | Quantity |
| EMP039                                         |  | P      | _____    |

| Selector Switches – Two position |                                                                                     |        |          |
|----------------------------------|-------------------------------------------------------------------------------------|--------|----------|
|                                  | Diagram                                                                             | Symbol | Quantity |
| EMP049                           |  | Q      | _____    |
| EMP059                           |   | R      | _____    |

| Selector Switches – Three position |                                                                                      |        |          |
|------------------------------------|--------------------------------------------------------------------------------------|--------|----------|
|                                    | Diagram                                                                              | Symbol | Quantity |
| EMP069                             |    | S      | _____    |
| EMP069-S634                        |                                                                                      | S4     | _____    |
| EMP069-S635                        |                                                                                      | S5     | _____    |
| EMP079                             |    | T      | _____    |
| EMP079-S634                        |                                                                                      | T4     | _____    |
| EMP079-S635                        |                                                                                      | T5     | _____    |
| EMP089                             |  | U      | _____    |
| EMP089-S634                        |                                                                                      | U4     | _____    |
| EMP089-S635                        |                                                                                      | U5     | _____    |

| Selector Switches – Keyed Selector Switches |                                                                                      |        |       |
|---------------------------------------------|--------------------------------------------------------------------------------------|--------|-------|
|                                             | Diagram                                                                              | Symbol | Qty   |
| EMP0491                                     |  | Q6     | _____ |
| EMP0492                                     |                                                                                      | Q7     | _____ |
| EMP0493                                     |                                                                                      | Q8     | _____ |
| EMP0591                                     |  | R6     | _____ |
| EMP0592                                     |                                                                                      | R7     | _____ |
| EMP0593                                     |                                                                                      | R8     | _____ |
| EMP0691                                     |  | S6     | _____ |
| EMP0692                                     |                                                                                      | S7     | _____ |
| EMP0693                                     |                                                                                      | S8     | _____ |
| EMP0694                                     |                                                                                      | S9     | _____ |
| EMP0791                                     |  | T6     | _____ |
| EMP0792                                     |                                                                                      | T7     | _____ |
| EMP0793                                     |                                                                                      | T8     | _____ |
| EMP0794                                     |                                                                                      | T9     | _____ |
| EMP0891                                     |  | U6     | _____ |
| EMP0892                                     |                                                                                      | U7     | _____ |
| EMP0893                                     |                                                                                      | U8     | _____ |
| EMP0894                                     |                                                                                      | U9     | _____ |

Total Number of all Devices on this page \_\_\_\_\_



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Section 1: EMP Style Operators Continued

Number of Devices: Indicate the Number of Devices, Openings Without Devices and Window(s) Required.

|                                                  |  |        |          |
|--------------------------------------------------|--|--------|----------|
| Openings Without Devices ( For Future Expansion) |  |        |          |
| 3/4" - 14 NPSM Opening (plugged)                 |  | Symbol | Quantity |
|                                                  |  | V      | _____    |

|         |        |          |               |
|---------|--------|----------|---------------|
| Windows |        |          |               |
| GUB0108 | Symbol | Quantity | # of Openings |
|         | W      | _____    | _____         |

Total Number of all Device  
Openings from previous page \_\_\_\_\_

Total Number of all Devices /  
Openings from Section 1 \_\_\_\_\_

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Section 2

**Completed Catalog Number:**  
Specify the complete catalog number including conduit designations.

EJB \_\_\_\_\_

All Eaton's Crouse-Hinds Custom-Built Control Panels are provided with a mounting plate and hinges. Hinges are on left side of enclosure. If you desire hinges on one of the other sides, circle choice here: TOP RIGHT BOTTOM

Section 3—Exterior Front View

**Location of Devices and Windows in Cover:**  
Outline the cover space available, beginning in the upper left corner of the grid, based upon the EJB selected. See Table 1 for device layout.

Section 4

**Device Markings:**  
Indicate by row and column position markings/legends for each device.

**Engraved Plate:**  
Specify markings for each nameplate based upon the following:

|                                   |      |       |      |      |
|-----------------------------------|------|-------|------|------|
| Maximum Number of Characters/Line |      |       |      |      |
| Marking Size                      | 1/8" | 3/16" | 1/4" | 1/2" |
| Number of Characters              | 36   | 24    | 18   | 9    |

|         |        |                                               |                       |              |
|---------|--------|-----------------------------------------------|-----------------------|--------------|
| Specify |        | Device Marking (DSL) or Engraved Plate Line 1 | Engraved Plate Line 2 | Marking Size |
| Row     | Column |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |
|         |        |                                               |                       |              |

|                                                                                                                                                                                                                                                                                         |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Distributor:                                                                                                                                                                                                                                                                            | Contact:      |
| Customer:                                                                                                                                                                                                                                                                               | Phone Number: |
| EATON'S CROUSE-HINDS FACTORY USE ONLY                                                                                                                                                                                                                                                   |               |
| Catalog Number Entered:                                                                                                                                                                                                                                                                 |               |
| Reference #:                                                                                                                                                                                                                                                                            | B#            |
| OPTIONS                                                                                                                                                                                                                                                                                 |               |
| For any of the following options, check here:<br><input type="checkbox"/> ATEX Certified (ATEX)<br><input type="checkbox"/> Breather and Drain (S756V)<br><input type="checkbox"/> Epoxy finish, external (S752)<br><input type="checkbox"/> Epoxy finish, internal and external (S753) |               |

|                                 |   |                                                              |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|---------------------------------|---|--------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| size                            |   | Top (column)                                                 |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|                                 |   | 1                                                            | 2                     | 3                     | 4                     | 5                     | 6                     | 7                     | 8                     | 9                     | 10                    | 11                    | 12                    | 13                    |
| Left Side (Hinge Side)<br>(row) | A | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | B | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | C | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | D | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | E | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | F | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | G | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | H | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | I | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | J | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | K | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | L | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 | M | <input type="radio"/>                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|                                 |   | Bottom                                                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|                                 |   | Note: All device openings are spaced 2.62" center to center. |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |

5C

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 II 2 G Ex d IIB + H<sub>2</sub>, T5 NEMA 3, 7BCD, 9EFG

As indicated in the listings, certain barrel assemblies are the same as those used in complete EMP units and may be utilized as replacements.

The remainder are primarily for use with hazardous area boxes to assemble special control stations. For additional information, see pages 576–583 describing custom-built control panels.

## Certifications and Compliances:

- Class I, Division 1 & 2, Groups B, C, D
- Class II, Division 2, Groups E, F, G
- Class III
- NEMA/IEEAC: 3, 7BCD, 9EFG
- UL Standard 1203
- CSA Standard C22.2 No 30
- CENELEC
- ATEX Certificate ITS07 ATEX 15652U

## Ordering Information:

Select the Cat. No. from the listings. For pilot lights and illuminated pushbuttons, specify color of jewel using symbols from the table below. For pushbuttons and selector switches, optional markings may be specified in the tables below.

### Group 1:

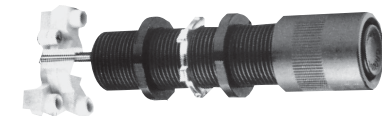
Standard assemblies are for replacement in complete EMP units or for custom-built control panels. Short assemblies are for custom-built control panels only. Both assemblies may be used with System 4 Control Stations.

### Pilot light†



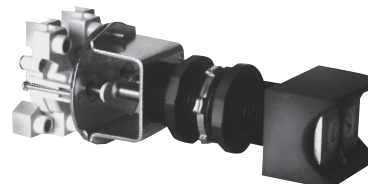
| Diagram                                                                                     | Standard Assembly Cat. # |
|---------------------------------------------------------------------------------------------|--------------------------|
|  (120V)* | EMP009 ①                 |

### Single pushbutton Double pushbutton, single operator



| Diagram                                                                           | Short Cat. # | Standard Cat. # |
|-----------------------------------------------------------------------------------|--------------|-----------------|
|  | EMPS019 ②    | EMP019 ②        |
|  | EMPS029 ②    | EMP029 ②        |

### Double pushbutton, double operator



| Diagram                                                                             | Short Assembly Cat. # | Standard Assembly Cat. # |
|-------------------------------------------------------------------------------------|-----------------------|--------------------------|
|  | EMPS039 ②             | EMP039 ②                 |

### Two-position selector switch



| Diagram Position 1                                                                                                                                                                                                                                                                                                                                             | Position 2                                                                                                                                                                                                                                                                                                                                                     | Short Assembly Cat. # | Standard Assembly Cat. # |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|
| A1 <br>A2                                                                                                                                                                                 | A1 <br>A2                                                                                                                                                                                 | EMPS049 ②             | EMP049 ②                 |
| A1  B1 <br>A2  B2  | A1  B1 <br>A2  B2  | EMPS059 ②             | EMP059 ②                 |

### Three-position selector switch

| Diagram Position 1                                                                                                                                                                                                                                                                                                                                             | Position 2                                                                                                                                                                                                                                                                                                                                                     | Position 3                                                                                                                                                                                                                                                                                                                                                           | Short Assembly Cat. # | Standard Assembly Cat. # |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|
| A1 <br>A2                                                                                                                                                                                | A1 <br>A2                                                                                                                                                                                | A1 <br>A2                                                                                                                                                                                    | EMPS069 ②             | EMP069 ②                 |
| A1  B1 <br>A2  B2  | A1  B1 <br>A2  B2  | A1  B1 <br>A2  B2  | EMPS079 ②             | EMP079 ②                 |
| A1  B1 <br>A2  B2  | A1  B1 <br>A2  B2  | A1  B1 <br>A2  B2  | EMPS089 ②             | EMP089 ②                 |

① Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

② If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

#### Push Button Station Marking

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

† LED pilot lights can be furnished in place of standard incandescent pilot lamps. Add suffix LED to end of catalog number after last color symbol.

\* Other voltages available. Consult factory. For 24 VDC operation, add suffix S300.

‡ The following suffixes may be used with these catalog numbers: S634 - Momentary contact clockwise, spring return to center; S635 - Momentary contact counter-clockwise, spring return to center.

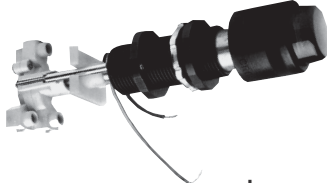
# EMP and EMPS Barrel Assemblies

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 II 2 G Ex d IIB + H<sub>2</sub>, T5 NEMA 3, 7BCD, 9EFG

5C

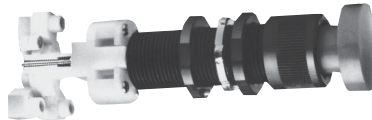
## Group 2: For custom-built control panels.

### Illuminated pushbutton†



| Diagram          | Long Assembly Cat. # |
|------------------|----------------------|
| 120V pilot light | EMP0090 ①            |
| 120V pilot light | EMP0098 ①            |

### Maintained Contact Pushbutton



| Diagram |        | Long Assembly Cat. # |
|---------|--------|----------------------|
| Up      | Down   |                      |
| A1  A2  | A1  A2 | EMP098 ②             |

①Add color symbol for each pilot light from table below.

| Color | Symbol | Color | Symbol |
|-------|--------|-------|--------|
| Red   | J1     | Clear | J10    |
| Green | J3     | Blue  | J11    |
| Amber | J6     |       |        |

### Two-position selector switch, key operated



②If desired, markings on indicating plates may be added to catalog number. Select from the list of standard markings below:

#### Push Button Station Marking

|       |     |       |           |           |       |      |       |
|-------|-----|-------|-----------|-----------|-------|------|-------|
| START | OFF | RESET | LIGHT ON  | EMERGENCY | OPEN  | DOWN | RAISE |
| STOP  | RUN | TRIP  | HAND      | FORWARD   | CLOSE | IN   | LOWER |
| ON    | JOG | TEST  | AUTOMATIC | REVERSE   | UP    | OUT  |       |

| Diagram        |                | Key Removal    | Short Assembly Cat. # | Standard Assembly Cat. # |
|----------------|----------------|----------------|-----------------------|--------------------------|
| Position 1     | Position 2     |                |                       |                          |
| A1  A2         | A1  A2         | Both positions | EMPS0491 ②            | EMP0491 ②                |
|                |                | Left only      | EMPS0492 ②            | EMP0492 ②                |
|                |                | Right only     | EMPS0493 ②            | EMP0493 ②                |
| A1  B1  A2  B2 | A1  B1  A2  B2 | Both positions | EMPS0591 ②            | EMP0591 ②                |
|                |                | Left only      | EMPS0592 ②            | EMP0592 ②                |
|                |                | Right only     | EMPS0593 ②            | EMP0593 ②                |

### Three-position selector switch, key operated

| Diagram        |                |                | Key Removal | Short Assembly Cat. # | Standard Assembly Cat. # |
|----------------|----------------|----------------|-------------|-----------------------|--------------------------|
| Position 1     | Position 2     | Position 3     |             |                       |                          |
| A1  A2         | A1  A2         | A1  A2         | All         | EMPS0691 ②            | EMP0691 ②                |
|                |                |                | Center only | EMPS0692 ②            | EMP0692 ②                |
|                |                |                | Left only   | EMPS0693 ②            | EMP0693 ②                |
|                |                |                | Right only  | EMPS0694 ②            | EMP0694 ②                |
| A1  B1  A2  B2 | A1  B1  A2  B2 | A1  B1  A2  B2 | All         | EMPS0791 ②            | EMP0791 ②                |
|                |                |                | Center only | EMPS0792 ②            | EMP0792 ②                |
|                |                |                | Left only   | EMPS0793 ②            | EMP0793 ②                |
|                |                |                | Right only  | EMPS0794 ②            | EMP0794 ②                |
| A1  B1  A2  B2 | A1  B1  A2  B2 | A1  B1  A2  B2 | All         | EMPS0891 ②            | EMP0891 ②                |
|                |                |                | Center only | EMPS0892 ②            | EMP0892 ②                |
|                |                |                | Left only   | EMPS0893 ②            | EMP0893 ②                |
|                |                |                | Right only  | EMPS0894 ②            | EMP0894 ②                |

† LED pilot lights can be furnished in place of standard incandescent pilot lamps.

Add suffix LED to end of catalog number after last color symbol.

※ The following suffixes may be used with these catalog numbers: S634 - Momentary contact clockwise, spring return to center; S635 - Momentary contact counter-clockwise, spring return to center.

## Crouse-Hinds

by EATON

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585

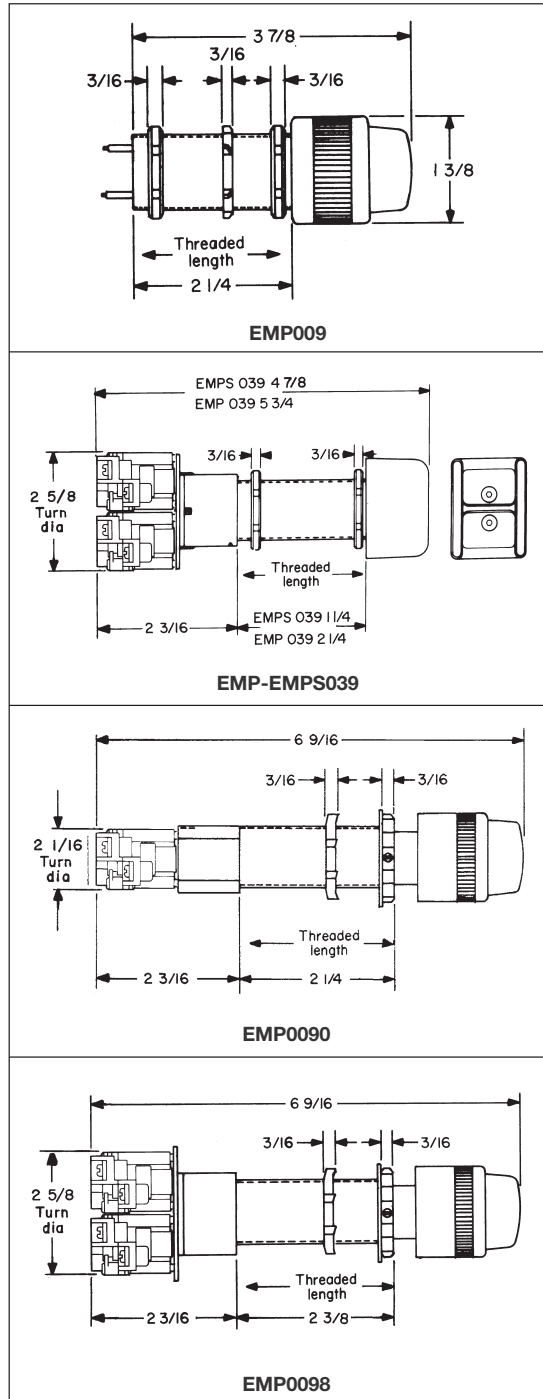
5C

# 5C

## EMP and EMPS Barrel Assemblies

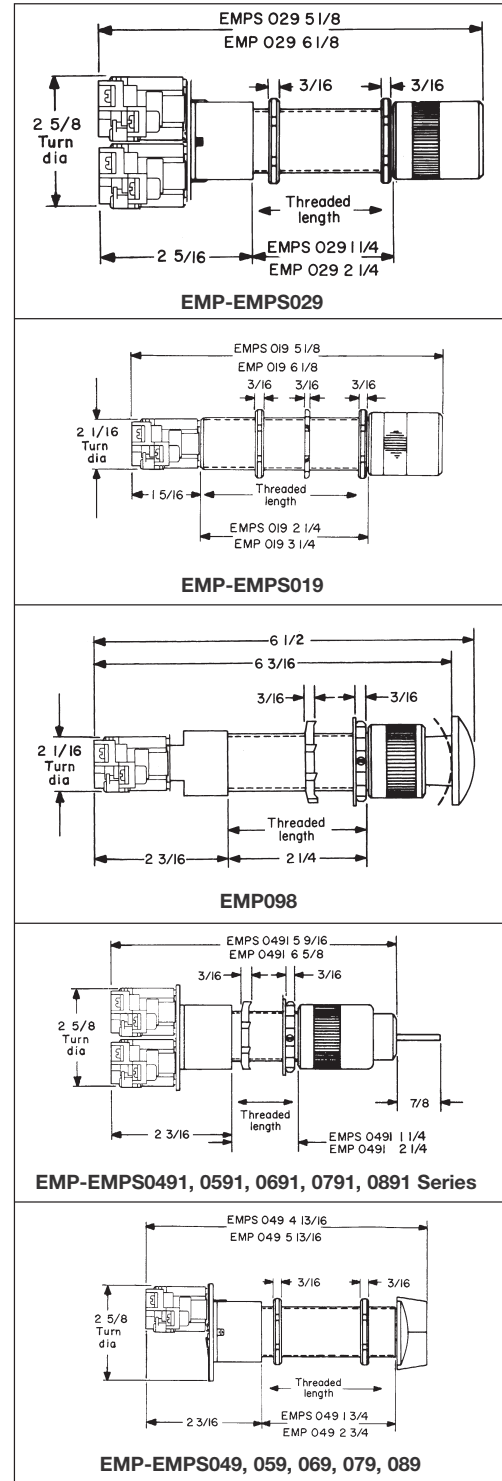
Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 II 2 G Ex d IIB + H<sub>2</sub>, T5 NEMA 3, 7BCD, 9EFG

### Dimensions\* In Inches:



\*Dimensions are approximate, not for construction purposes.

All barrel assemblies are 3/4"-14 NPSM thread size.



**Crouse-Hinds**  
by **F.T.N**

# EGL Static Grounding Indicator

## With Automated Pump Control and Static Ground Verification System

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. I, Zone 1 & 2 IIB + H<sub>2</sub>  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III

UL/cUL Listed  
NEMA 3, 4X, 7BCD, 9FG, 12  
Explosionproof  
Dust-Ignitionproof  
Raintight / Wet Locations

5C

### Applications:

EGL Static Grounding Indicator is the ideal product for safe loading/unloading of ethanol, biofuel, petroleum, chemicals, plastics and other combustible materials. The EGL is mounted adjacent to loading/unloading areas and connected to transportation tank vehicles, railcars, drums or other portable containers to prevent explosions due to static discharge during product transfer by providing:

- A ground path for static build-up
- Automatic pump shutdown when static grounding circuit is broken
- Visual indication of safe, static grounding before, during and after loading and unloading operations

### Features and Benefits:

- Static ground verification system provides ground path for static build-up to ensure safe product transfer
- Integrated control relay allows for safe control of electrically operated pumps or valves, and for energizing remote indicators
- Stainless steel clamp for grounding connection provides industrial durability, corrosion resistance, and increased product lifetime
- Interior and exterior epoxy powdered paint finish provides superior corrosion resistance inside and out
- LED pilot lights provide long-lasting visual identification of status of ground connection
- ECD Type 4X drain protects interior equipment from environmental moisture and condensation, rain water, and hose-down applications
- NEMA 4X compact, hose-tight, and corrosion-resistant enclosure offers years of service in harsh industrial environments
- 25 ft. safety fluorescent yellow cord is easily identifiable to ensure safety and reduce tripping hazard
- Neoprene cover gasket provides a watertight seal to meet UL Type 4 (NEMA 4) requirements
- Stainless steel hinges are corrosion resistant while providing safe and easy access to interior of enclosure
- Waterguard™ desiccant packet absorbs and removes water/moisture and protects the enclosed equipment when not energized
- Adjustable mounting feet provide ease of mounting during installation

### Certifications & Compliances:

- Class I, Divisions 1 & 2, Groups B, C, D
- Class I, Zone 1&2 IIB + H<sub>2</sub>
- Class II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- UL/cUL Listed
- IP 65
- NEMA 3, 4X, 7BCD, 9FG, 12

### Standard Materials:

- Enclosure: Copper-free aluminum with interior and exterior epoxy powder coat
- Clamp: Stainless steel
- Clamp Grips: Polyvinylchloride dipped
- Gasket: Neoprene

### Electrical Rating Ranges:

- 120-volt AC supply
- Control relay interlocking contact: 15A at 277VAC; 10A at 600VAC
- Dual-tapped 240 and 480 VAC Step Down Transformer available
- Provides 2k ohms or less switching impedance



### Ordering Information:

**Description**  
Indicator with two pilot lights\*

**Catalog Number**  
EGL210 J1 J3

\*Includes one red and one green pilot light.

### Options:

| Description                                                         | Suffix |
|---------------------------------------------------------------------|--------|
| Internal space heaters to limit condensation build-up               | R11    |
| Transformer suitable for both 220/240VAC or 440/480VAC applications | S883   |
| 50 foot cord                                                        | 50FC   |

### Options:

#### Replacement Parts:

Ground clamp  
Ground clamp assembly (includes 25 ft. cord, connector and clamp)  
EGL210 universal interior replacement kit  
Pilot lights (Red)  
Pilot lights (Green)  
Mounting feet  
Transformer (220/240VAC; 440/480VAC)  
Space heater  
Pilot light plug kit

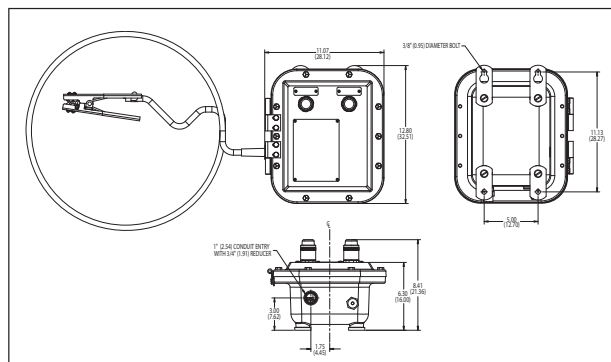
EGL-K1  
EGL:20109-B  
EGL210-R1  
EMP009-J1-LED  
EMP009-J3-LED  
EJB-KIT5  
EGL S883 KIT  
EGL R11 KIT  
EGL PLUG KIT

### Weight & Dimensions:

**EGL Assembly:**

**Weight = 32 lbs (14.5 kg)**

**Dimensions = inches (centimeters)**



**Crouse-Hinds**

by **E.T.N**

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587



# AFU and AFUX Conveyor Belt Control Switch

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

## Applications:

AFU and AFUX conveyor control switches are used:

- As emergency or normal "STOP" switch for conveyor lines, cranes, unloaders, bulk handling systems and similar equipment
- In steel mills, mining and ore and coal handling operations, automotive and other assembly lines, warehouses, loading docks and various process industry facilities
- In the control circuit of magnetic motor starters to shut down motor-driven conveyors or other machinery when switch is actuated

AFU series complies with requirements for use in Class II areas having combustible dusts that may or may not be electrically conductive.

AFU series are also gasketed for use in hosedown areas even when combustible dusts are present.

AFUX series complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFUX series also complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFUX series also complies with NEC requirements for use in Class II hazardous areas, or for use in NEC hazardous areas classified simultaneously as Class I and Class II.

## Features:

- Furnished with one or two end units, each containing 2-NO and 2-NC contact arrangements.
- Precision switches provide maintained contact (switches have a snap action mechanism).
- Enclosure has three 1" conduit hubs – two for horizontal through feed and one at the bottom. Cast mounting lugs on 1½" centers permit attachment to the web of a standard 3" angle iron.
- In installation, the actuating line or cable is connected from a fixed point to the loop on the end unit. A pull on the line of the required operating force and with a total movement of ½" actuates the plunger, opens the switch and trips the red painted indicating arm forward, which locks the plunger in the actuated (switch open) position. Returning the indicating arm to its normal position resets the mechanism. A typical installation would include single end switch units at each end of the conveyor with double end switch units between.
- Depending on the size and length of line, supports at properly spaced intervals may be necessary to ensure that the line or cable weight alone will not actuate switch.

## Certifications and Compliances:

### AFU Series

- NEC/CEC:
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- Encl. 3, 5
- NEMA: 3, 4, 9EFG
- IP66
- UL Standard: 698
- CSA Standard: 22.2 No. 30

### AFUX Series

- NEC:
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 7CD, 9EFG
- IP65
- UL Standard: 698
- cUL

## Standard Materials:

- Enclosure – *Feraloy*® iron alloy
- Plunger – stainless steel
- Loop – bronze
- Indicating arm – steel

## Standard Finishes:

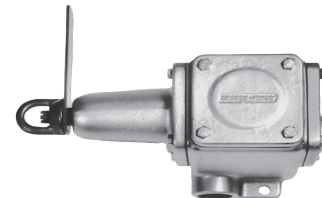
- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized with chromate finish (red acrylic paint on indicating arm)
- Bronze – natural

## Options:

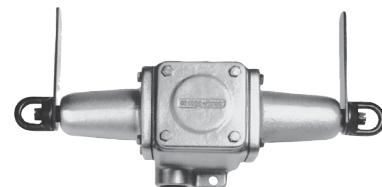
**Description** **Suffix**  
Finish: *Corro-free*™ epoxy powder coat – for coating outside only. **S752**

## Electrical Rating:

- Control circuit switch – 15 AMP, 600 VAC max.



AFU0333-50 Single end left



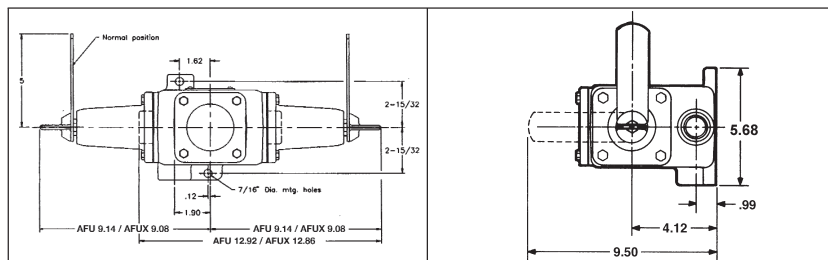
AFU0333-66 Double end

## Ordering Information

| Description      | Maximum Weight of Unsupported Line or Cable Without Actuating Switch† (lbs.) | Total Operating Force Required (lbs.) | Contact Arrangements With 2-NO, 2-NC in Each End Unit |             |
|------------------|------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------|-------------|
|                  |                                                                              |                                       | Cat. #                                                | Cat. #      |
| Single end left  | 15                                                                           | 25                                    | AFU0333 50                                            | AFUX0333 50 |
| Single end left  | 25                                                                           | 50                                    | AFU0333 60                                            | AFUX0333 60 |
| Single end right | 15                                                                           | 25                                    | AFU0333 05                                            | AFUX0333 05 |
| Single end right | 25                                                                           | 50                                    | AFU0333 06                                            | AFUX0333 06 |
| Double end       | 15                                                                           | 25                                    | AFU0333 55                                            | AFUX0333 55 |
| Double end       | 25                                                                           | 50                                    | AFU0333 66                                            | AFUX0333 66 |

†A galvanized steel aircraft cable, supported every 10' is recommended.

## Dimensions In Inches\*:



\*Dimensions are approximate, not for construction purposes.

**Crouse-Hinds**  
by **F.T.N**



# AFA and AFAFX Conveyor Belt Alignment Switch

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4, 7CD, 9EFG

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations

5C

## Applications:

AFA, AFAFX conveyor belt alignment switches are used:

- As emergency or normal "STOP" switch for conveyor belts whenever they become misaligned or run off their tracks due to excessive speed, uneven load, leveling, breakage and/or other problems.
- In steel mills, mining and ore and coal handling operations, automotive and other assembly lines, warehouses, loading docks, grain loading and handling facilities, and various other bulk handling operations.
- In the control circuit of magnetic motor starters to shut down motor-driven conveyors in case of abnormal belt misalignment or run-off.

AFA series complies with requirements for use in Class II areas having combustible dusts that may or may not be electrically conductive.

AFA series are also gasketed for use in hosedown areas even when combustible dusts are present.

AFAFX series complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFAFX series also complies with NEC requirements for use in Class II hazardous areas, or for use in NEC hazardous areas classified simultaneously as Class I and Class II.

## Features:

- Furnished with precision switches that provide normally open and normally closed contacts (switches have a snap action mechanism).
- Housing consists of a center section which can be mounted either vertically or horizontally, and a switch housing with an attached switch operating arm.
- Enclosure has three 1" conduit hubs. Cast mounting lugs on 1½" center permit attachment to the web of a standard 3" angle iron.
- Operating arm has 3½" long stainless steel protective roller. Approximately ¾" lateral movement of operating arm actuates switch.
- Spring loaded operating arm will automatically return switch to normal position when belt interference is removed.
- A severe conveyor belt run-off can rotate the operating arm counter-clockwise up to 85 degrees without damage to the switch mechanism.
- Installation of AFA or AFAFX unit on either side of a conveyor belt allows approximately 1" or a predetermined allowable belt misalignment before switch is actuated. A typical installation would include a pair of AFA or AFAFX units at each end of the conveyor belt where belt returns.

## Certifications and Compliances:

### AFA SERIES

- NEC/CEC:  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA: 3, 4, 9EFG
- IP66
- UL Standard: 698
- CSA C22.2 No. 25

### AFAFX SERIES

- NEC:  
Class I, Division 1 & 2, Groups C, D  
Class II, Division 1, Groups E, F, G  
Class II, Division 2, Groups F, G  
Class III
- NEMA: 3, 7CD, 9EFG
- IP65
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

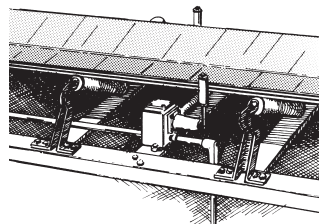
## Standard Materials:

- Enclosure – *Feraloy*® iron alloy
- Bearing and operating arm – stainless steel with plastic end caps

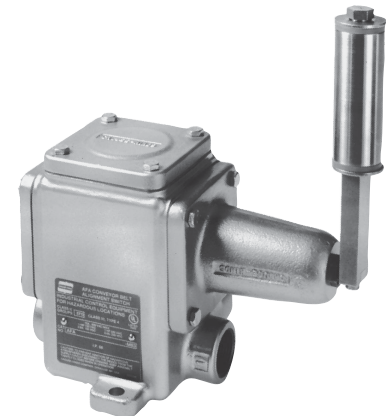
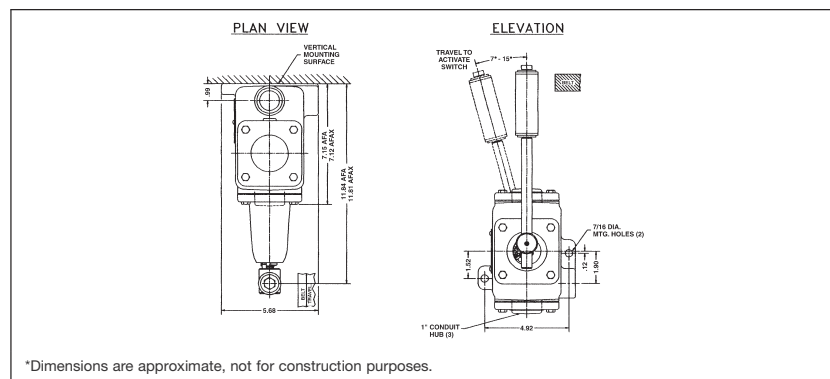
## Standard Finishes:

- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Stainless steel – natural

## Typical AFA Switch Application



## Dimensions In Inches\*:



## Electrical Rating:

- Control circuit switches – 15 AMP, 600 VAC max.

## Ordering Information

| Contact Arrangement | Diagram | Cat. #  |
|---------------------|---------|---------|
| 2 normally open     |         | AFA20   |
| 2 normally closed   |         | AFAFX20 |

## Options:

| Description                                                               | Suffix |
|---------------------------------------------------------------------------|--------|
| Finish: <i>Corro-free</i> ™ epoxy powder coat – for coating outside only. | S752   |

600 VAC

**Applications:**

AFU mine signal switches are used:

- For signalling circuits or remote control of magnetic motor starters
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

**Features:**

- Sturdy raintight enclosure with heavy mounting lugs
- Wires enter enclosure through clearance holes in the underside
- Switches are actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Units are furnished with heavy duty motor control push buttons. Several of these may be interconnected electrically for remote control of a magnetic motor starter from more than one location

**Certifications and Compliances:**

- NEMA: 3

**Standard Materials:**

- Enclosure – *Feraloy*® iron alloy
- Plunger – steel
- Loop – bronze

**Standard Finishes:**

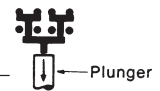
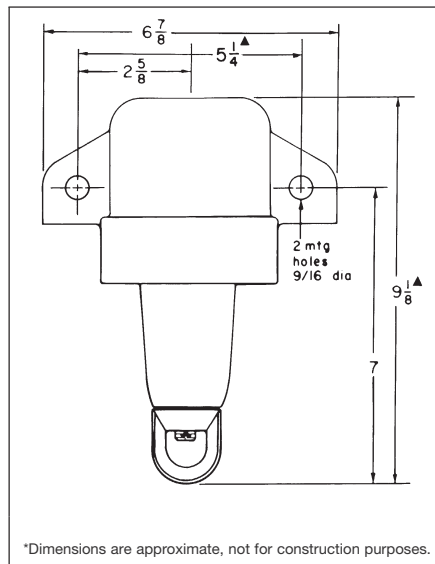
- *Feraloy* – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural



AFU mine signal switch with pushbutton switch (cover removed)

**Ordering Information**

| Maximum Wt. of Line or Cable Without Actuating Switch (lbs.) | Total Operating Force Required (lbs.) | With Pushbutton Heavy Duty 600 VAC Max. Cat. # |
|--------------------------------------------------------------|---------------------------------------|------------------------------------------------|
| 25                                                           | 50                                    | AFU254                                         |
| 15                                                           | 25                                    | AFU154                                         |

**Dimensions In Inches\*:**

# FLEXITITE™ D2X Series Attachable Pendant Pushbutton Stations

For Class I, Div. 2 Areas

NEMA 3, 4X, 5, 6, 7BCD (Div. 2), 9FG (Div. 2), 12  
Watertight  
Raintight  
Dust-tight  
Wet Locations

5C

## Applications:

FLEXITITE attachable pendant pushbutton stations are used:

- For safe multi-function motor circuit control of:
  - Hoists
  - Cranes
  - Machine Tools
  - Electromagnets
- In hazardous areas such as Class I, Division 2, Groups B, C and D (classified) areas or Class II, Division 2, Groups F and G, as defined by the National Electrical Code
- Where wash downs are necessary – in damp, wet, dirty or corrosive locations
- For control applications requiring 2 to 8 functions

## Features:

- Safety cushioned – neoprene encapsulation protects internal switches and connectors from impact damage and provides extra protection for personnel.
- Stress relief for your cable is built-in. A separate cable grip is not needed.
- Uses Eaton's Crouse-Hinds ESWP factory sealed contacts suitable for use in Class I, Division 2, Groups B, C, and D.
- Switches are rated for 10 amps 600 VAC (NEMA A600).
- Indicator plates meet OSHA requirements for clear identification of functions. A full set of plates is included with each station.
- Jam-resistant operator buttons are raised flexible diaphragms – an integral part of the molded one-piece cover.
- Compact design.
- Safety yellow finish.

## Certifications and Compliances:

- NEMA: 3, 4X, 5, 6, 7BCD (Div. 2), 9FG (Div. 2), 12
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

## Standard Materials:

- Body and cover – steel reinforced neoprene
- Strain relief and reinforcement plates – stainless steel
- Exterior hardware – stainless steel

## Standard Finishes:

- Neoprene – safety yellow
- Stainless steel – natural



8-Button Control Station

5C

# FLEXITITE™ D2X Series

## Attachable Pendant Pushbutton Stations

### For Class I, Div. 2 Areas

NEMA 3, 4X, 5, 6, 7BCD (Div. 2), 9FG (Div. 2), 12  
 Watertight  
 Raintight  
 Dust-tight  
 Wet Locations

### Ordering Information

#### Pendant Pushbutton Stations

| Description | Cable Dia. | Cat. #      |
|-------------|------------|-------------|
| 2-Button    | .31 – .75  | D2X8635 210 |
| 4-Button    | .50 – .75  | D2X8635410  |
| 6-Button    | .59 – .81  | D2X8635 610 |
| 8-Button    | .59 – .92  | D2X8635 810 |

#### Replacement Indicator Plates

(A full set is included with each control station)

##### 2-Button

| Cat. #   | Description | Cat. #   | Description |
|----------|-------------|----------|-------------|
| 315116 1 | Down/West   | 315116 7 | Rev/Left    |
| 315116 2 | Start/North | 315116 8 | Up/East     |
| 315116 3 | Stop/South  |          |             |
| 315116 4 | Off/In      |          |             |
| 315116 5 | On/Out      |          |             |
| 315116 6 | Fwd/Right   |          |             |

##### 4, 6 and 8-Button

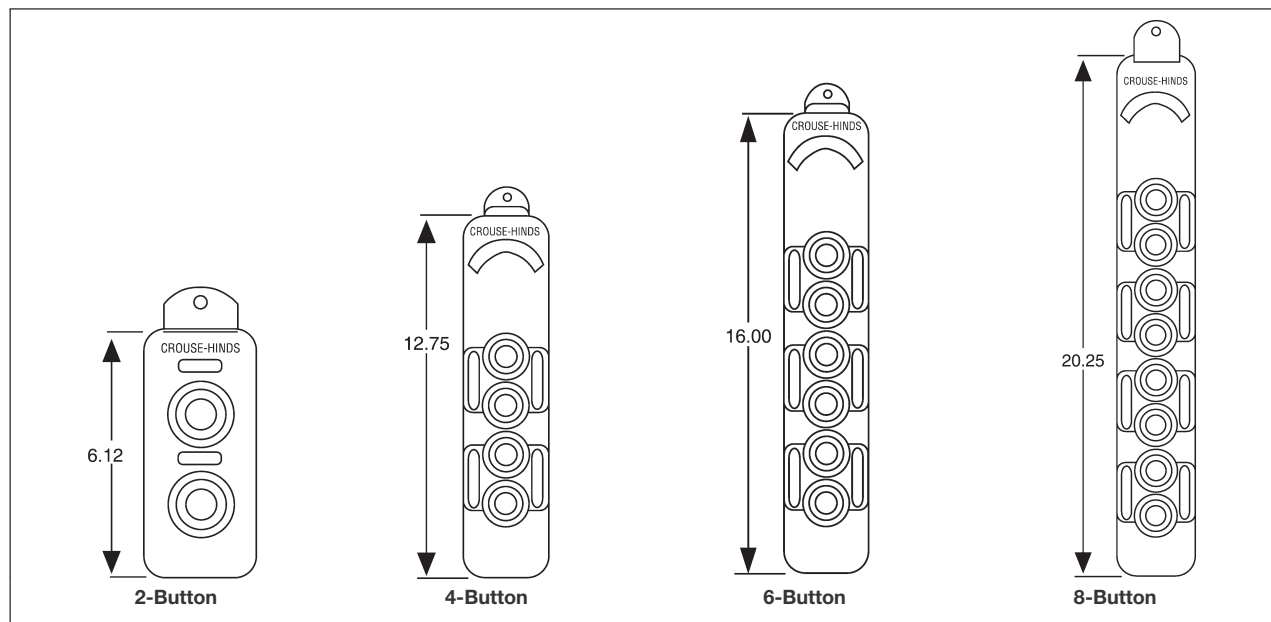
| Cat. #   | Description | Cat. #   | Description |
|----------|-------------|----------|-------------|
| 314850 1 | Bridge      | 314850 6 | Fwd/Rev     |
| 314850 2 | Trolley     | 314850 9 | North/South |
| 314850 3 | Hoist       |          | On/Off      |
| 314850 4 | In/Out      |          | Start/Stop  |
| 314850 5 | Up/Down     |          |             |
|          | Right/Left  |          |             |
|          | East/West   |          |             |

#### Replacement Switch

| Description        | Cat. #  |
|--------------------|---------|
| Replacement Switch | ESWP126 |

### Dimensions

In Inches:



# FLEXITITE™ Attachable Pendant Pushbutton Stations

NEMA 3, 4X, 5, 6, 12

Raintight  
Watertight  
Dust-tight  
Wet Locations

5C

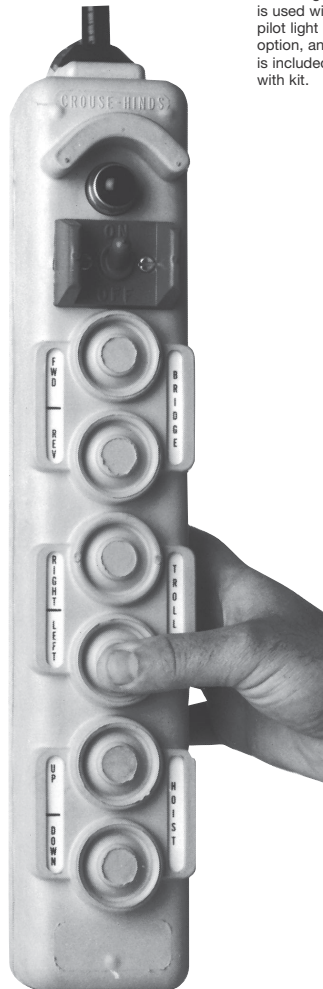
## Applications:

FLEXITITE attachable pendant pushbutton stations are used:

- For safe, multi-function motor circuit control of:
  - Hoists
  - Cranes
  - Machine Tools
  - Electromagnets
- Non-hazardous control environments requiring from 2 to 8 functions.
- Where washdowns are necessary – in damp, wet, dirty, or corrosive locations.

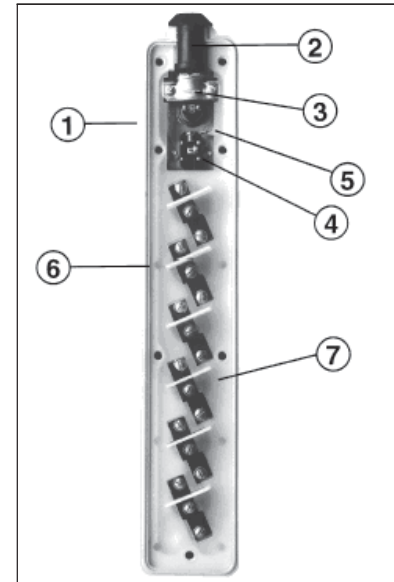
## Features:

- Safety insulated to meet OSHA requirements for enclosing live parts. The entire unit except the strain relief is insulated with neoprene.
- Safety cushioned – neoprene encapsulation protects internal switches and connectors from impact damage and provides extra protection for personnel.
- Stress relief for your cable is built-in. A separate cable grip is not needed unless the optional pilot light kit is used.
- Positive action long life momentary contact switches.
- Maintained Off-On toggle switch is optionally available on 4, 6, and 8 button units.
- Jam resistant operator buttons are raised flexible diaphragms – an integral part of the molded one-piece cover.
- Compact – 3" x 3" enclosure easily fits your hand.
- Indicator plates meet OSHA requirements for clear identification of functions. A full set of plates is provided with each station.



A cable grip is used with pilot light option, and is included with kit.

## Inside Front View



1. BODY SEAL – Compresses against mating half to form a positive seal.
  2. REDUCING GROMMETS – Permit use of five different cable sizes while sealing cable entrance.
  3. CABLE CLAMP – Secures conductors inside switch. Transfers strain to inner steel core of switch. (Not used with pilot light.)
  4. TOGGLE SWITCH (OPTIONAL) – Maintained off-on switch to control power to pendant stations.
  5. GREEN GROUNDING SCREW – Makes positive contact between inner steel core and ground wire.
  6. INSULATION BARRIERS – On 4- and 6-button models. Position switches and separate N.O. and N.C. switch contacts for added safety.
  7. SEPARATOR – For 4- and 6-button models. Tough polypropylene sheet retains switches and forms an insulated wiring channel.
- STRAIN RELIEF – Integral part of the inner steel core – provides tie-off point for strain chain to relieve tension from electrical cable.
- ELECTRICAL INTERLOCK – Schematic furnished to wire switches against opposed operations.
- LOW COST, EASILY INSTALLED – Despite their many advantages, Eaton's Crouse-Hinds pendant stations generally cost less than similar metal units.
- RAISED BUMPER – protects lens against damage caused by impact.

## Certifications and Compliances:

- NEMA: 3, 4X, 5, 6, 12
- UL Standard: 508
- CSA Approved

## Standard Materials:

- Body and cover – steel reinforced neoprene
- Strain relief and reinforcement plates – stainless steel
- Exterior hardware – stainless steel

## Standard Finishes:

- Neoprene – safety yellow
- Steel – stainless steel

**Crouse-Hinds**  
by **Eaton**

5C

# FLEXITITE™ Attachable Pendant Pushbutton Stations

NEMA 3, 4X, 5, 6, 12

Raintight  
Watertight  
Dust-tight  
Wet Locations

## Ordering Information - One and Two Speed 2, 4, 6 and 8 Buttons

| Style                                                                             | Switch* | 1 Speed<br>20A 460V<br>2 hp. 230V | 2 Speed<br>10A 230V<br>½ hp. 230V | DC<br>10A 125V<br>⅓ hp. 125V | Cable<br>Diameter | Shipping<br>Weight<br>(lbs.) | Dimensions |       |       |
|-----------------------------------------------------------------------------------|---------|-----------------------------------|-----------------------------------|------------------------------|-------------------|------------------------------|------------|-------|-------|
|                                                                                   |         |                                   |                                   |                              |                   |                              | Length     | Width | Depth |
| <b>2-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | None    | X8635 21                          | X8635 22                          | X8635 20                     | .555 thru .665    | 2½                           | 8¾"        | 2¼"   | 3"    |
| <b>4-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | 3316317 | X8635 41B                         | X8635 42B                         | X8635 40B                    | .505 thru .730    | 3                            | 13½"       | 3"    | 3⅝"   |
| <b>6-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | 3316317 | X8635 61B                         | X8635 62B                         | X8635 60B                    | .590 thru .840    | 6½                           | 17"        | 3"    | 3⅝"   |
| <b>8-Button</b>                                                                   |         |                                   |                                   |                              |                   |                              |            |       |       |
|  | 3316317 | X8635 81                          | X8635 82\$                        | X8635 80                     | .698 thru .968    | 9                            | 21½"       | 3"    | 3⅞"   |

\*Should be ordered separately.

\$2 speed includes: 6, 2-speed switches and 2, single speed switches.

## Pilot Light Kit for 4, 6 and 8-Button Only

| Lamp Voltage | Cable Diameter |              |              | 8 Button     |  |
|--------------|----------------|--------------|--------------|--------------|--|
|              | 4 and 6 Button |              |              |              |  |
|              | .50 thru .62   | .63 thru .74 | .75 thru .87 | .69 thru .97 |  |
| 110-125V AC  | 3316533        | 3316533 1    | 3316533 2    | 3316624      |  |
| 210-250V AC  | 3316534        | 3316534 1    | 3316534 2    | 3316625      |  |

Pilot light kit includes: lamp assembly with lens and bulb, cable support grip, and "S" hook.  
Support grip and "S" hook not required on 8-button. NEMA 3,4,5,12 only.

## FLEXITITE™ 2-Button Attachable Pendant Switch

| Cat. #  | Contact Style    | Voltage | Amps Make | Amps Break |
|---------|------------------|---------|-----------|------------|
| X8995 1 | Momentary Switch | 240 AC  | 7.5       | 0.75       |
| Yellow  |                  | 120 AC  | 15.0      | 1.5        |
|         |                  | 24 AC   | 15.0      | 2.5        |
|         |                  | 250 VDC | 0.27      | 0.27       |
|         |                  | 125 VDC | .055      | 0.55       |



## Indicator Plates (Replacement only – units come with plates standard)

| 2-Button |             |           |             | 4, 6 and 8-Button |                        |           |                        |
|----------|-------------|-----------|-------------|-------------------|------------------------|-----------|------------------------|
| Cat. #   | Description | Cat. #    | Description | Cat. #            | Description            | Cat. #    | Description            |
| 315116 1 | Down/West   | 315116 7  | Rev/Left    | 314850 1          | Bridge                 | 314850 6  | Fwd/Rev. (North/South) |
| 315116 2 | Start/North | 315116 8  | Up/East     | 314850 2          | Trolley                | 314850 9  | On/Off (Start/Stop)    |
| 315116 3 | Stop/South  | 315116 9  | Raise/Lower | 314850 3          | Hoist                  | 314850 12 | Raise/Lower            |
| 315116 4 | Off/In      | 315116 10 | Up/Down     | 314850 4          | In/Out (Up/Down)       | 314850 13 | Inbd/Outbd             |
| 315116 5 | On/Out      | 315116 11 | Right/Left  | 314850 5          | Right/Left (East/West) | 314850 14 | Off/On                 |
| 315116 6 | Fwd/Right   |           |             |                   |                        |           |                        |

Shoulder Bolts for Fastening Front to Back Cover – 2-Button (P/N 1316311-2); 4- &amp; 6-Button (P/N 1316311-1); 8 button (P/N 1316311-3).

NOTE: Refer to price list for identification of stock items.

## Replacement Parts

| Style    | Cat. #      |            | Switch Element Part Numbers |                             |                              |                         |                       |                    |                  | Parts Kit‡ | Pilot Light Kit |                 |
|----------|-------------|------------|-----------------------------|-----------------------------|------------------------------|-------------------------|-----------------------|--------------------|------------------|------------|-----------------|-----------------|
|          | Front Cover | Back Cover | Toggle Switch Kit†          | 1 Speed 20A, 460V 2hp, 230V | 2 speed 10A, 230V ½ hp. 230V | DC 10A, 125V ⅓ hp. 125V | Toggle Off/On Element | Barrier            | Separator        |            |                 |                 |
| 2-Button | A335578     | A335577    | 1 Not Avail.                | 3316480                     | 314896                       | 314903                  |                       |                    |                  |            | RX8635 21       | See Above Chart |
| 4-Button | 3335848     | 1 3335829  | 1 3316317                   | 3316480                     | 314896                       | 314903                  | 1316313               | 314849 1 (4 Req'd) | 335616 (1 Req'd) | RX8635 41  |                 |                 |
| 6-Button | 3335845     | 1 3335830  | 1 3316317                   | 3316480                     | 314896                       | 314903                  | 1316313               | 314849 1 (6 Req'd) | 335571 (1 Req'd) | RX8635 61  |                 |                 |
| 8-Button | 3344153     | 3344154    | 3316317                     | 3316480                     | 314896                       | 314903                  | 1316313               | Not Req'd          | Not Req'd        | RX8635 80  |                 |                 |

†Toggle switch kit – includes: toggle switch, guard, assembly and screws.

‡Parts kit – includes cable grommets, legend plates and assembly screws.



# EGF Series Ground Fault Control Station

Cl. I, Div. 1 & 2, Groups C, D Explosionproof  
Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
Cl. II, Div. 2, Groups F, G Raintight  
Cl. III Wet Locations  
NEMA 3, 7CD, 9EFG, 12

**5C**

## Applications:

EGF Series of control stations are used:

- For the additional safety of personnel, and for equipment protection in remote areas.

## Features:

- Copper-free aluminum construction offers lightweight, corrosion resistance and a long, maintenance-free service life.
- 1 1/4" throughfeed conduit hubs with 1 1/4"-1" reducers for ease of installation.
- Compact, internally flanged enclosure requires minimum installation area.
- Steel mounting feet with electroplate finish for fast, secure, and corrosion-resistant mounting.
- Accepts #14-#10 copper wire sizes for application flexibility.
- Push-to-test button and pilot light (with 10,000 hour incandescent lamp) for easy and constant operational monitoring of unit.
- Cast aluminum circuit breaker operating handle for durability during use.
- EPD breakers for protection of heat tracing circuits.

## Certifications and Compliances:

- NEC:  
Class I, Div. 1 & 2, Groups C, D  
Class II, Div. 1, Groups E, F, G  
Class II, Div. 2, Groups F, G  
Class III
- NEMA 3, 7CD, 9EFG, 12

## Standard Materials:

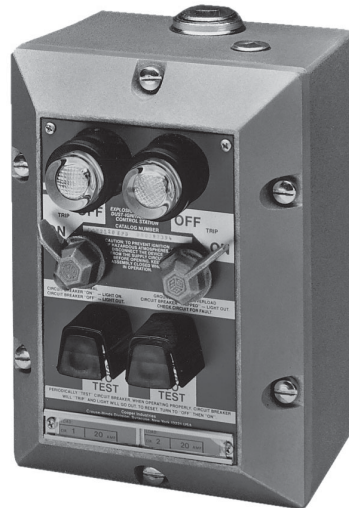
- Bodies, covers, threaded barrels, guards, collars, and toggle operator – copper-free aluminum
- Pushbuttons – type 6 / 6 nylon
- Operating shafts – stainless steel

## Standard Finishes:

- Copper-free aluminum – natural
- Sheet steel – zinc electroplate with chromate finish
- Stainless steel – natural

## Electrical Rating:

- GFI, EPD breakers – 120 VAC (single pole), 120 / 240 VAC for two pole (10,000 AIC)

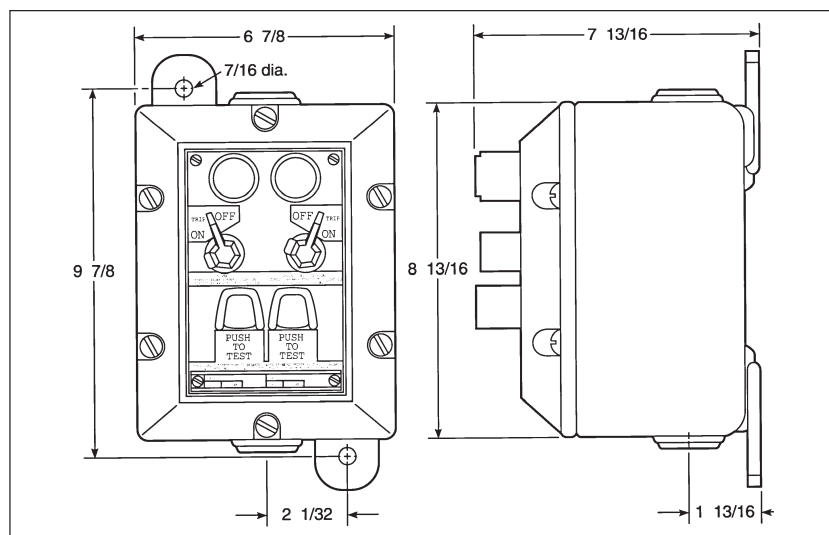


## Ordering Information

| Number of Breakers | Number of Poles | Milliamp Trip | Cat. #     |
|--------------------|-----------------|---------------|------------|
| 1                  | 1               | 5             | EGF11 ①    |
| 1                  | 2               | 5             | EGF12 ①    |
| 2                  | 1               | 5             | EGF21 ①    |
| 1                  | 1               | 30            | EGF11EPD ① |
| 1                  | 2               | 30            | EGF12EPD ① |
| 2                  | 1               | 30            | EGF21EPD ① |

①Add 15, 20, 25, or 30 amp breaker rating.

## Dimensions In Inches:





# 5C

## DSD-TS Series Timers

Cl. I, Div. 1 & 2, Groups C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III

For use with Eaton's Crouse-Hinds EDS/EDSC back boxes (single and two-gang) and EDSCM modular control device bodies (up to nine-gang maximum). These bodies are to be ordered separately from the DSD-TS covers.

### Applications:

- Provides automatic shut-off for fans, heaters, pumps, lights, and other energy consuming loads in Class I and Class II hazardous areas

### Features:

- Spring wound, mechanical timer switch
- Copper-free aluminum covers

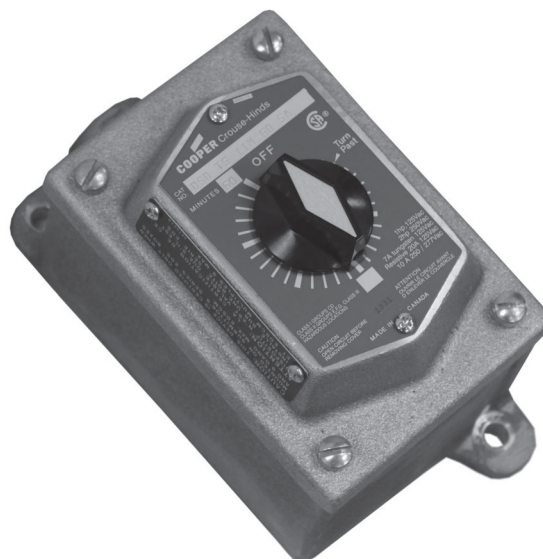
### Certifications and Compliances:

- CSA certified per file LR5169
- Class I, Divisions 1 & 2, Groups C, D
- Class II, Divisions 1 & 2, Groups E, F, G
- Class III

**NOTE:** Suitable for use in Zone 1 and Zone 2 classified areas (gas groups IIB and IIA) as per Canadian Electrical Code, Part I, Section 18-100(a).

### Electrical Ratings:

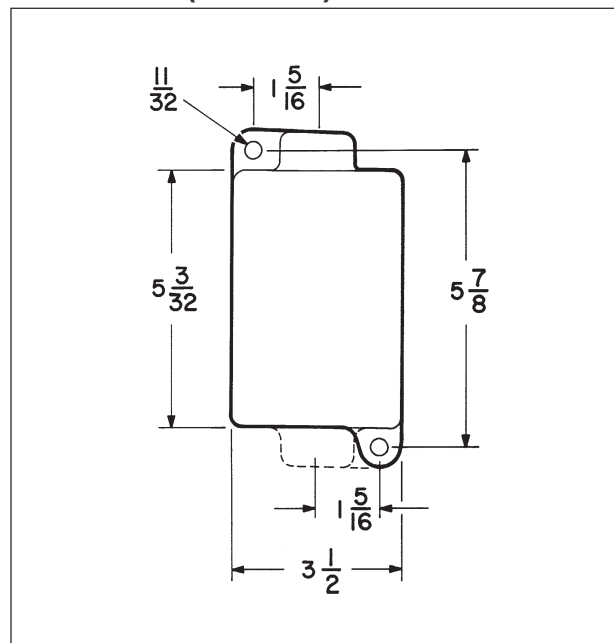
- 1 HP, 125 VAC max.
- 2 HP, 250 VAC max.
- 7A Tungsten, 125 VAC max.
- 20A resistive 125 VAC max.
- 10A resistive 250 VAC max.
- 10A resistive 277 VAC max.



### Catalog Numbering Example:

|                   |        |                                     |                          |                                                                        |                                                            |
|-------------------|--------|-------------------------------------|--------------------------|------------------------------------------------------------------------|------------------------------------------------------------|
|                   | DSD TS | 11                                  | M                        | 15                                                                     | SA                                                         |
| Series:           | DSD-TS |                                     |                          |                                                                        |                                                            |
| Poles:            |        | 11 - SPST<br>12 - SPDT<br>21 - DPST |                          |                                                                        |                                                            |
| Minutes or Hours: |        |                                     | M - Minutes<br>H - Hours |                                                                        |                                                            |
| Time:             |        |                                     |                          | 5 - 5 Minutes<br>15 - 15 Minutes<br>30 - 30 Minutes<br>60 - 60 Minutes |                                                            |
| Hours:            |        |                                     |                          |                                                                        | 2 - 2 Hours<br>4 - 4 Hours<br>6 - 6 Hours<br>12 - 12 Hours |
| Material:         |        |                                     |                          |                                                                        | SA - Aluminum                                              |

### Dimensions (in Inches):



**Note:** Depth is 5.5" from front of switch to back of box.

| Description                                   | Page No.          |
|-----------------------------------------------|-------------------|
| Explosionproof VFDs - Class I, Division 1 & 2 |                   |
| ACE10 Series                                  | see pages 599–603 |
| ACE20 Series                                  | see pages 605–609 |



# ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

6C

## The only explosionproof VFD solution utilizing a NEMA 7 classified enclosure

Eaton's Crouse-Hinds Explosionproof VFDs are highly flexible AC drives designed specifically for hazardous area locations. These drives can be mounted next to the motor in the classified area, providing significant installation cost savings - along with the traditional VFD benefits of energy savings, speed and torque control, and system diagnostics.

This Eaton's Crouse-Hinds innovative product features the first ever NEMA 7 enclosure with active cooling, allowing the solution to be rated Class I, Divisions 1 and 2. It is designed to match the high requirements of pumps, compressors, fans, separators, and mixers in the following process industries:

- Oil and gas/refineries
- OEM skid builders
- Petrochemical
- Water/waste water
- Pharmaceutical
- Food and beverage manufacturing

### Applications:

- For speed control of pumps, compressors, fans, conveyors, separators, mixers, and other process equipment
- Designed to meet the high reliability and safety requirements of process industries such as oil and gas, chemical and mining

### ACE Series System Benefits:

#### Simple, Cost-Effective Installations

- ACE Explosionproof VFDs are installed 'on-machine' inside the hazardous areas, eliminating expensive, complicated installations
- There is no need to run long lines of conduit and motor cable, dig up roadways and sidewalks, navigate around obstacles and hazards or build off-site control rooms in non-hazardous areas to house VFD clusters
- Reflected Wave Syndrome is eliminated due to short motor cable runs

### Additional VFD Benefits:

#### Reduce Energy Costs Through Improved Process Control

- Fine speed and torque control optimizes system performance and reduces energy consumption

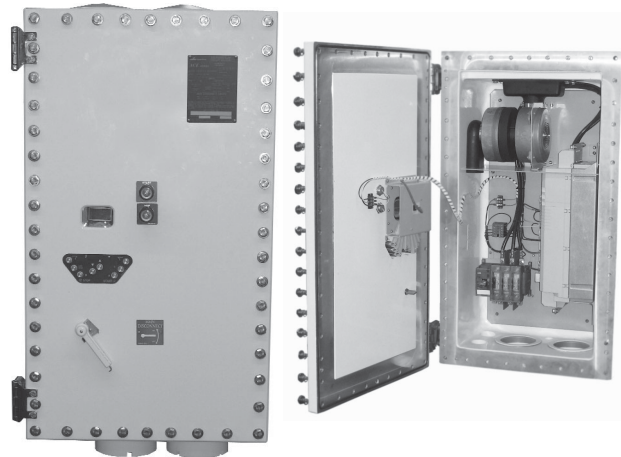
#### Reduce Operation and Installation Costs

- Reduce stress on electrical system
- Reduce water hammer effects with soft start capability
- Lower speed/load on bearings and seals
- Reduce risk of system damage due to cavitation

#### Avoid Downtime with Real-Time Equipment and Process Data

- Diagnostics help locate disturbances to the system and suggest remedies, allowing proactive maintenance decisions to be made

\*5HP and below listed for Group B.



6C

### Certifications and Compliances:

- UL Classified  
Class I, Divisions 1 and 2, Groups B, C, D
- cUL Classified  
Class I, Divisions 1 and 2, Groups B\*, C, D
- Standards  
UL 1203
- Environmental Ratings  
NEMA 3, 4X, 7BCD  
Raintight  
Wet locations
- Operating Temperature Range  
-10°C to 50°C (14°F to 122°F)

### Standard Materials and Finishes:

- Body and Cover – Copper-free aluminum, epoxy powder coated
- Operating Handle – Copper-free aluminum, epoxy painted
- Keypad – Stainless steel, natural
- Window – Tempered soda lime glass
- Blower – Aluminum, natural
- Filters – Stainless steel, natural
- Pre-filters – Stainless steel, natural
- Disconnect – Stainless steel, natural
- Shroud – Copper-free aluminum, epoxy painted
- Cover Hinges, Bolts, Washers and Springs – Stainless steel, natural
- Internal Brackets – Stainless steel, natural
- Manifold and Intake – EDPM rubber, natural

### Horsepower Ratings:

- Available up to 60HP
- Higher horsepower ratings coming soon

### VFD System Specifications:

- ABB ACS850 Series low voltage, compact AC drives

## Crouse-Hinds

by E.T.N

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

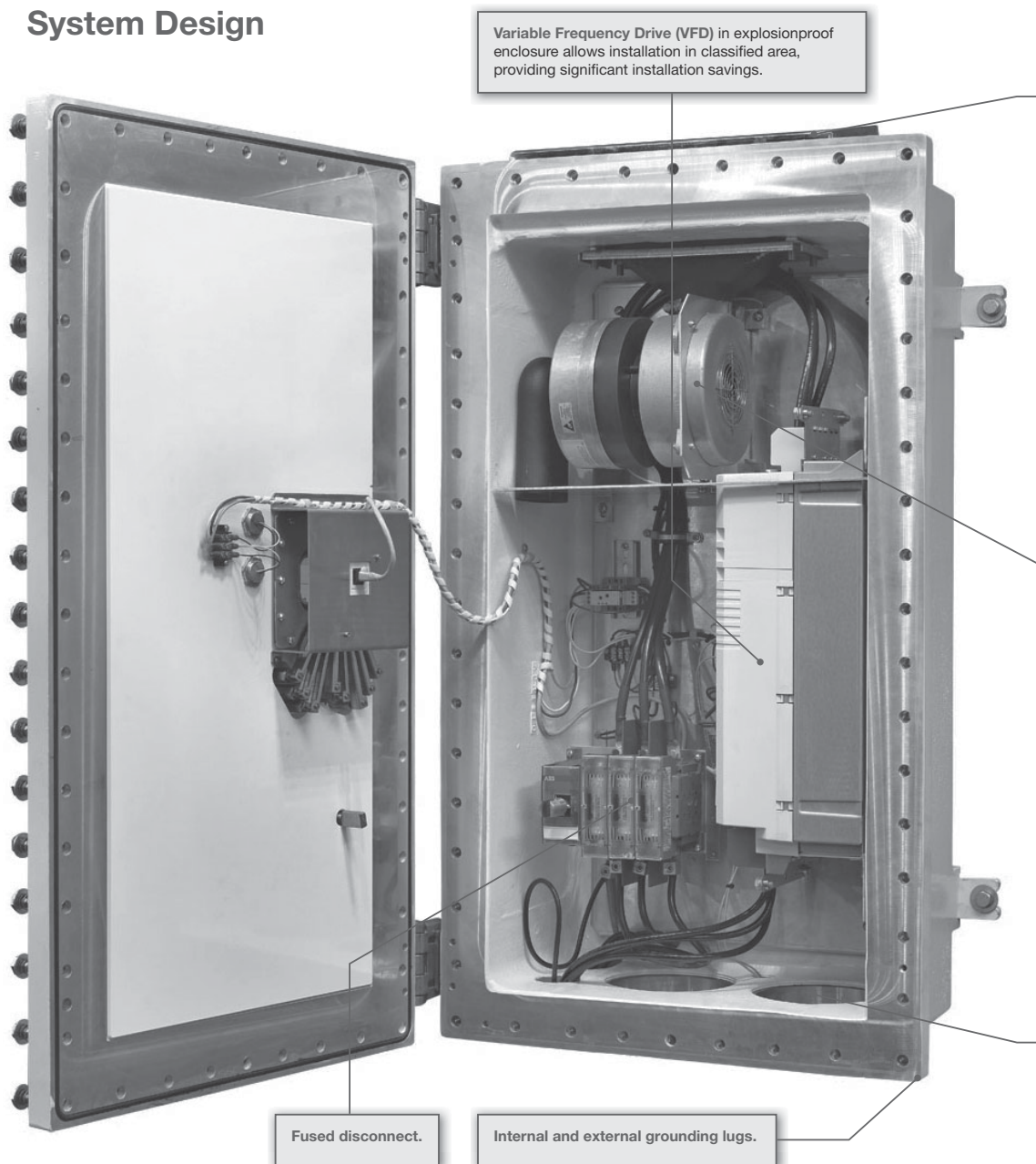
6C

## ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

### System Design



\*5HP and below listed for Group B.

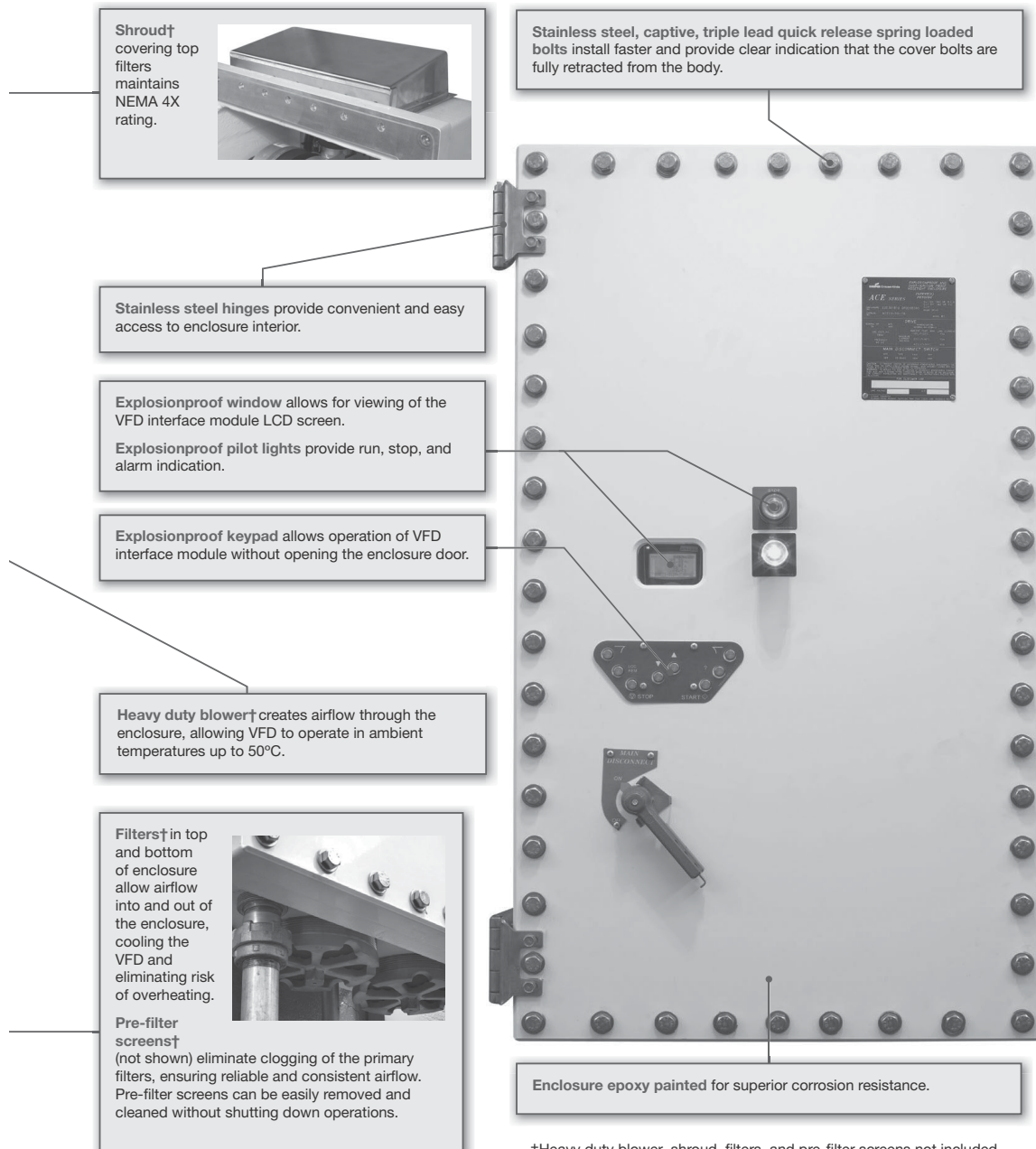
# ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet Locations

6C



†Heavy duty blower, shroud, filters, and pre-filter screens not included with units containing 1.5 to 5.0 horsepower VFDs.

\*5HP and below listed for Group B.

**Crouse-Hinds**  
by **EATON**

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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# 6C ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet Locations

## Ordering Information:

### Step 1 – Select VFD Horsepower Rating

| Cat. #   | Nominal Horsepower (KW) | Max. Disconnect Rating (Amps) | Disconnect Fuse Type | Enclosure Size | Input Rating (Amps) | Max. Output Rating (Amps)† | Power Loss (Watts)‡ | Temp. Rating |
|----------|-------------------------|-------------------------------|----------------------|----------------|---------------------|----------------------------|---------------------|--------------|
| ACE10 1  | 1.5 (1.1)               | 30                            | J                    | 1              | 2.3                 | 3.0                        | 106                 | T6           |
| ACE10 2  | 2.0 (1.5)               |                               | J                    | 1              | 3.1                 | 3.6                        | 112                 | T6           |
| ACE10 3  | 3.0 (2.2)               |                               | J                    | 1              | 4.0                 | 4.8                        | 132                 | T6           |
| ACE10 5  | 5.0 (3.0)               |                               | J                    | 1              | 6.6                 | 8.0                        | 178                 | T6           |
| ACE10 7  | 7.5 (5.5)               |                               | J                    | 1              | 12.0                | 12.2                       | 606                 | T4A          |
| ACE10 10 | 10.0 (7.5)              |                               | J                    | 1              | 16.0                | 15.6                       | 674                 | T4A          |
| ACE10 15 | 15.0 (11.0)             | 60                            | J                    | 2              | 20.0                | 23.0                       | 737                 | T4A          |
| ACE10 20 | 20.0 (15.0)             |                               | J                    | 2              | 26.0                | 30.0                       | 737                 | T4A          |
| ACE10 25 | 25.0 (18.5)             |                               | J                    | 2              | 30.0                | 35.0                       | 847                 | T4A          |
| ACE10 30 | 30.0 (22.0)             |                               | J                    | 2              | 36.0                | 44.0                       | 903                 | T4A          |
| ACE10 40 | 40.0 (30.0)             | 100                           | J                    | 2              | 55.0                | 58.0                       | 1217                | T4A          |
| ACE10 50 | 50.0 (37.0)             |                               | J                    | 2              | 65.0                | 72.0                       | 1397                | T4A          |
| ACE10 60 | 60.0 (45.0)             |                               | J                    | 2              | 82.0                | 81.0                       | 1577                | T4A          |

†De-rating may be required to account for specific environmental conditions (high ambient temperature, altitude, etc). Consult factory for de-rating information.

‡When not installed in a well ventilated environment, provisions must be made to account for heat generation to ensure proper operation of the device.

### Step 2 – Add Desired Options

Description add suffix

#### Communication Modules

|           |    |
|-----------|----|
| Profibus  | CP |
| Devicenet | CD |
| CAN Open  | CC |
| Modbus    | CM |
| Ethernet  | CE |

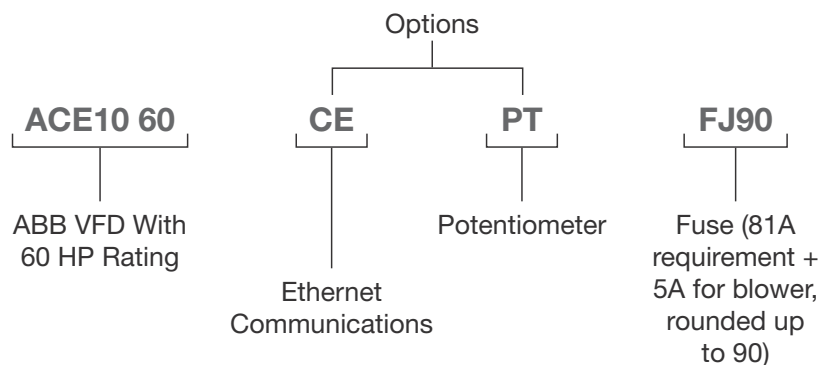
#### Potentiometer in Cover

|         |    |
|---------|----|
| AB 800H | PT |
|---------|----|

### Step 3 – Add Current Rating for Eaton's Bussmann Fuses



### Catalog Number Example:



### ACE Series Recommended Distributor Stock List:

| Description                                       | Cat. #    |
|---------------------------------------------------|-----------|
| Pre-filter and hardware (1 pc.)                   | ACE KIT 1 |
| Filter assembly (1 pc.)                           | ACE KIT 2 |
| Blower, manifold, and hardware (1 pc.)            | ACE KIT 3 |
| Pushbutton operator, finger, and hardware (1 pc.) | ACE KIT 4 |
| Temperature controller (1 pc.)                    | ACE KIT 5 |

\*5HP and below listed for Group B.



# ACE10 Series Explosionproof Variable Frequency Drives

Utilizes ABB ACS850 Series Drives

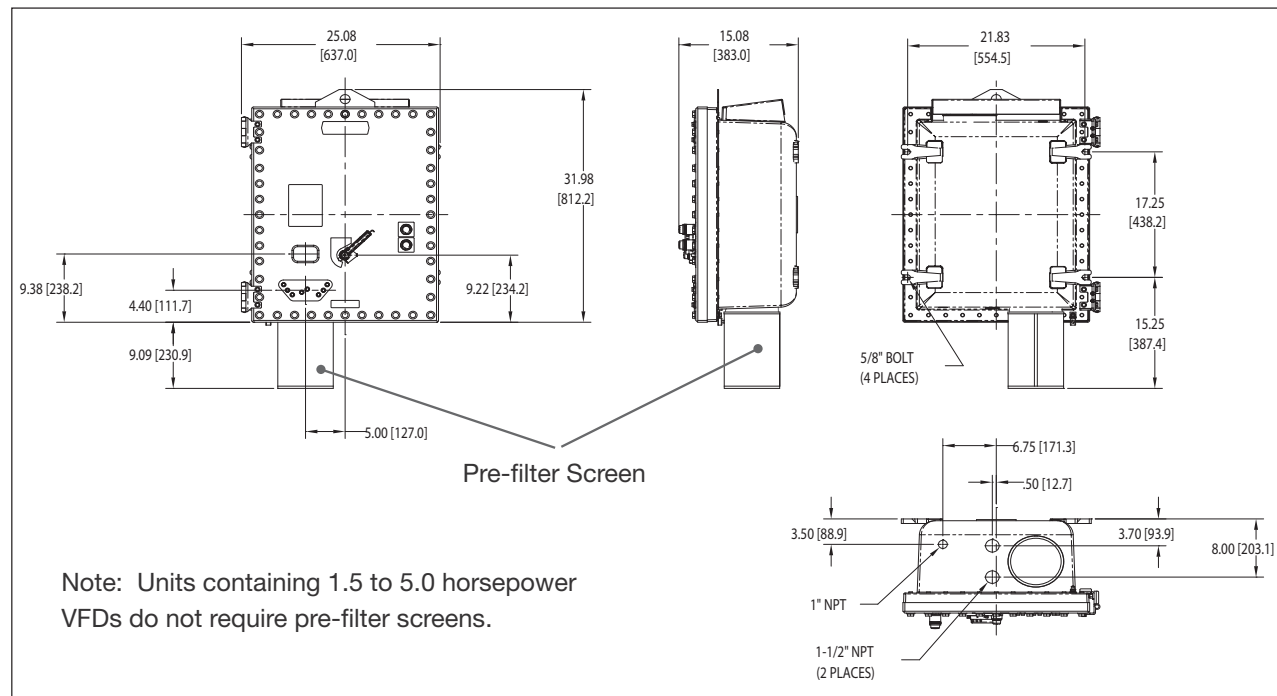
Cl. I, Div. 1 & 2, Groups B, C, D (UL)  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL)

NEMA 3, 4X, 7BCD  
Raintight  
Wet locations

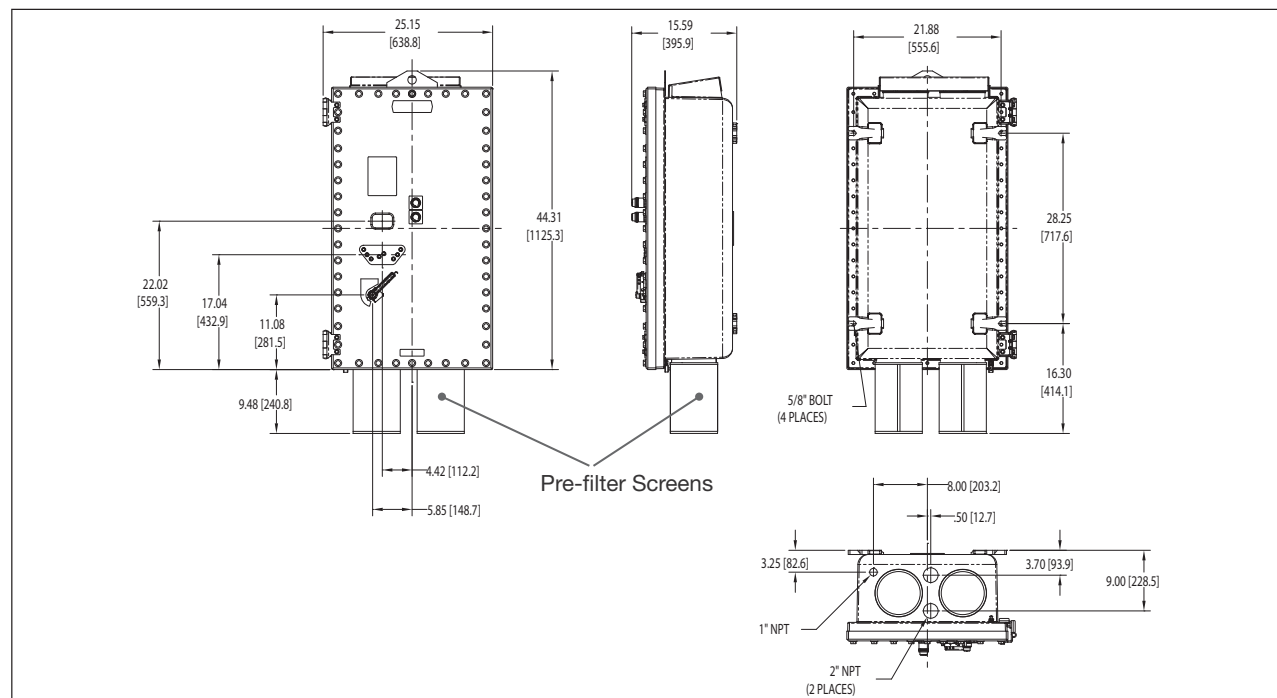
**6C**

## Dimensions

In Inches:



Enclosure Size 1 (1.5 to 10.0 Horsepower VFDs)



Enclosure Size 2 (15.0 to 60.0 Horsepower VFDs)

\*5HP and below listed for Group B.

**Crouse-Hinds**  
by **Eaton**

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# ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

**6C**

## The only explosionproof VFD solution utilizing a NEMA 7 classified enclosure

Eaton's Crouse-Hinds Explosionproof VFDs are highly flexible AC drives designed specifically for hazardous area locations. These drives can be mounted next to the motor in the classified area, providing significant installation cost savings - along with the traditional VFD benefits of energy savings, speed and torque control, and system diagnostics.

This Eaton's Crouse-Hinds innovative product features the first ever NEMA 7 enclosure with active cooling, allowing the solution to be rated Class I, Divisions 1 and 2. It is designed to match the high requirements of pumps, compressors, fans, separators, and mixers in the following process industries:

- Oil and gas/refineries
- OEM skid builders
- Petrochemical
- Water/waste water
- Pharmaceutical
- Food and beverage manufacturing

### Applications:

- For speed control of pumps, compressors, fans, conveyors, separators, mixers, and other process equipment
- Designed to meet the high reliability and safety requirements of process industries such as oil and gas, chemical, and mining

## ACE Series System Benefits:

### Simple, Cost-Effective Installations

- ACE Explosionproof VFDs are installed 'on-machine' inside the hazardous areas, eliminating expensive, complicated installations
- There is no need to run long lines of conduit and motor cable, dig up roadways and sidewalks, navigate around obstacles and hazards or build off-site control rooms in non-hazardous areas to house VFD clusters
- Reflected Wave Syndrome is eliminated due to short motor cable runs

### Additional VFD Benefits:

#### Reduce Energy Costs Through Improved Process Control

- Fine speed and torque control optimizes system performance and reduces energy consumption

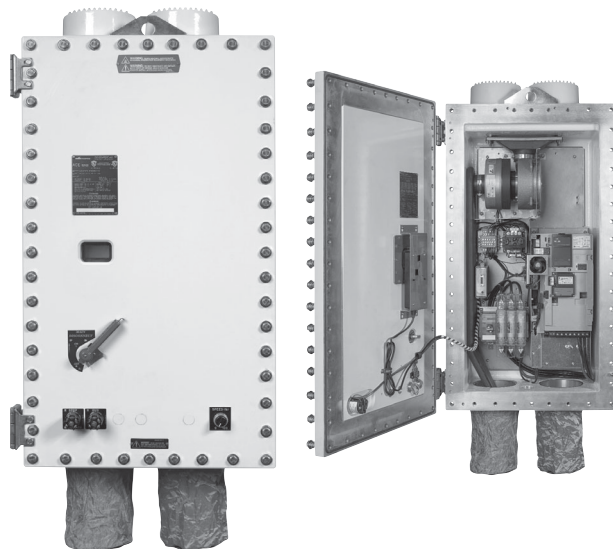
#### Reduce Operation and Maintenance Costs

- Reduce stress on electrical system
- Reduce water hammer effects with soft start capability
- Lower speed/load on bearings and seals
- Reduce risk of system damage due to cavitation

#### Avoid Downtime with Real-Time Equipment and Process Data

- Diagnostics help locate disturbances to the system and suggest remedies, allowing proactive maintenance decisions to be made

\*5HP and below listed for Group B.



### Certifications and Compliances:

- UL Classified  
Class I, Divisions 1 and 2, Groups B, C, D
- cUL Classified  
Class I, Divisions 1 and 2, Groups B\*, C, D
- Standards  
UL1203
- Environmental Ratings  
NEMA 3, 4X, 7BCD  
*NEMA 3X rating with PB23 or RR3 options added*  
Raintight  
Wet locations
- Operating Temperature Range  
0°C to 50°C (32°F to 122°F)

### Standard Materials and Finishes:

- Body and Cover – Copper-free aluminum, epoxy powder coated
- Operating Handle – Copper-free aluminum, epoxy painted
- Window – Tempered soda lime glass
- Blower – Aluminum, natural
- Filters – Stainless steel, natural
- Pre-filters – Stainless steel, natural
- Disconnect – Stainless steel, natural
- Shroud – Copper-free aluminum, epoxy painted
- Cover Hinges, Bolts, Washers and Springs – Stainless steel, natural
- Internal Brackets – Stainless steel, natural
- Manifold and Intake – EDPM rubber, natural

### Horsepower Ratings:

- Available up to 50HP
- Higher horsepower ratings coming soon

### VFD System Specifications:

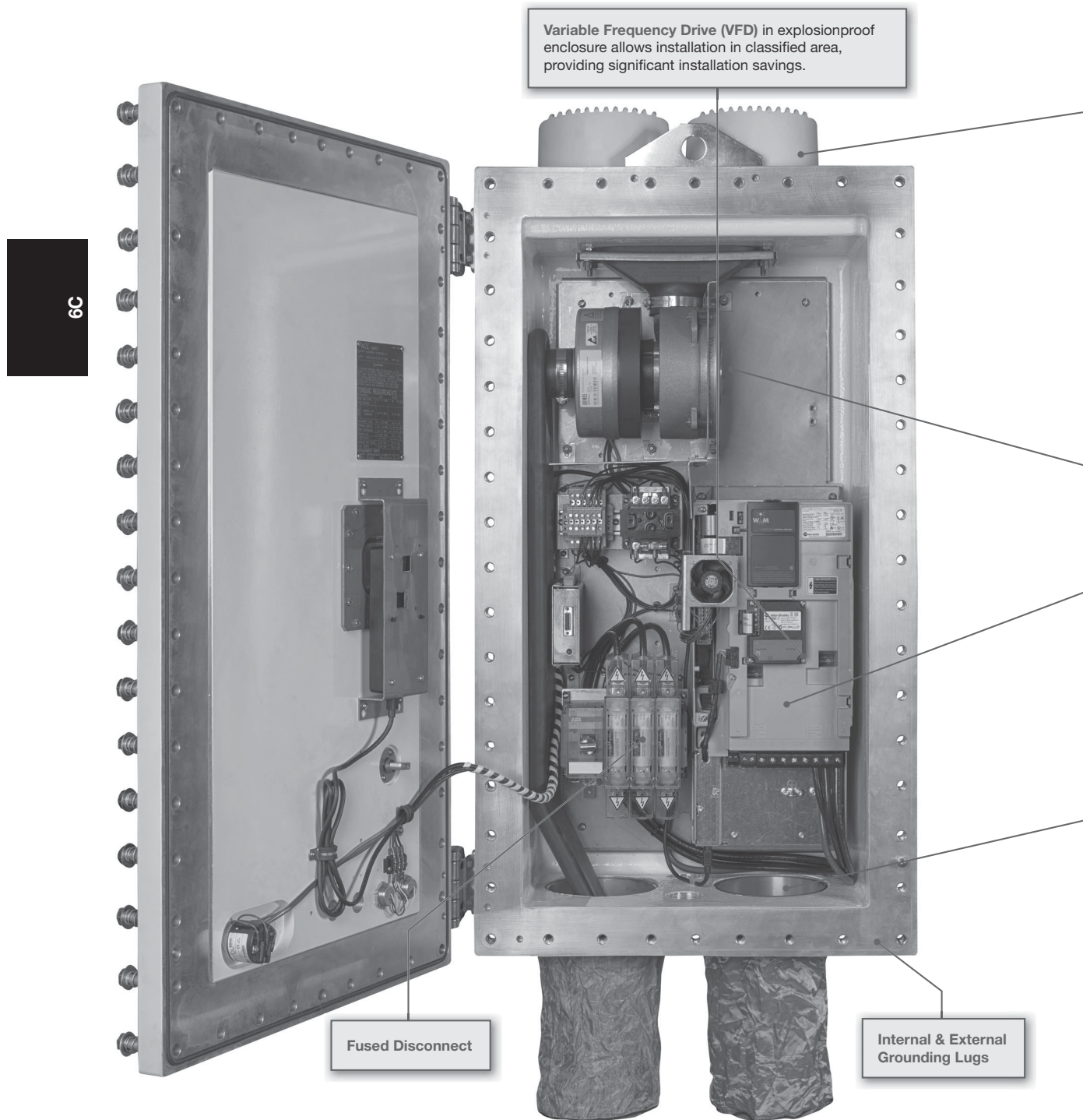
- Allen-Bradley® PowerFlex 700® Series low voltage, compact AC drives

6C

## ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex  
700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations



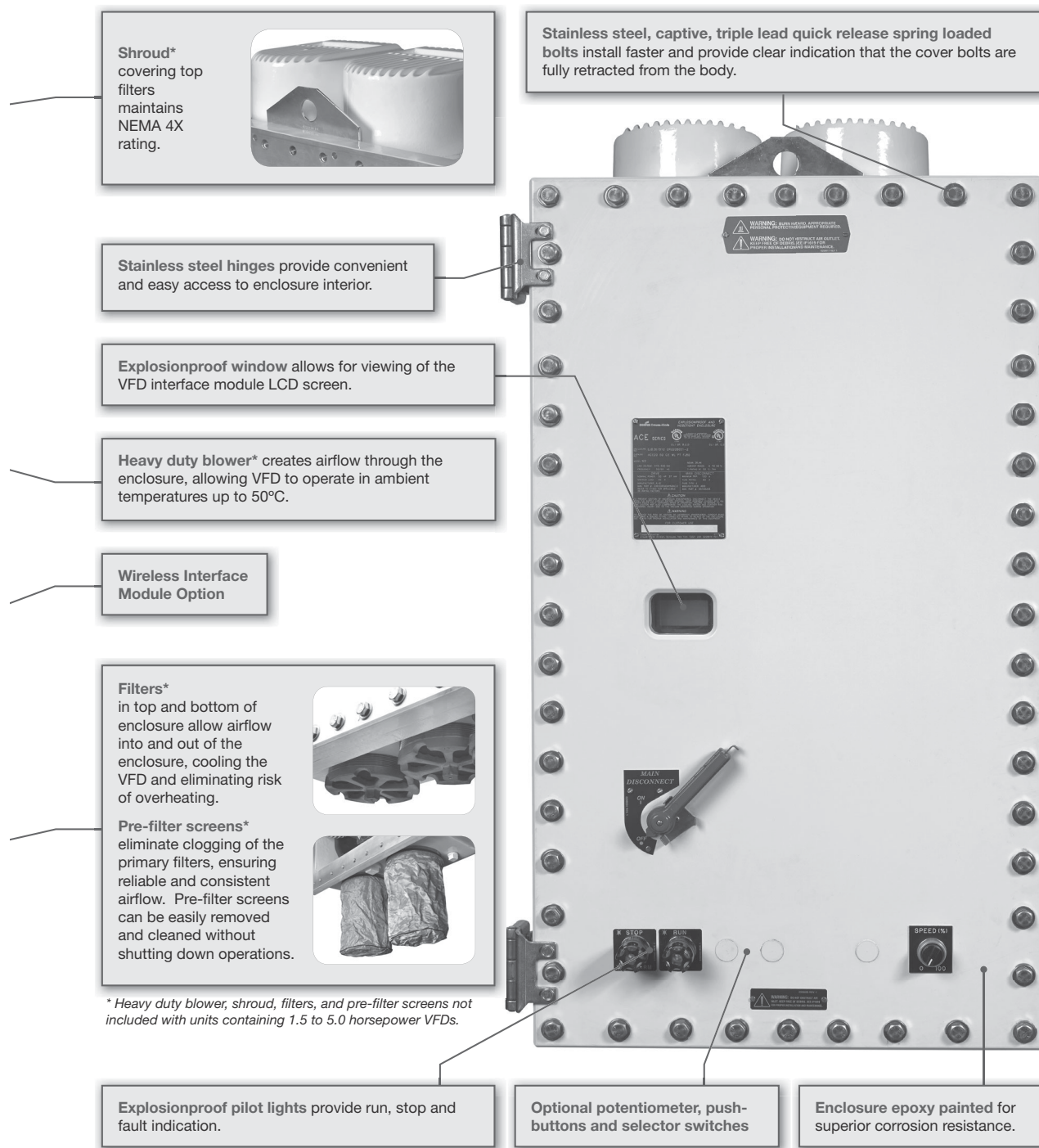
\*5HP and below listed for Group B.

# ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

**6C**



\*5HP and below listed for Group B.



# ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

## Ordering Information:

### Step 1 – Select VFD Horsepower Rating

| Cat. #   | Nominal Horsepower (KW) | Max. Disconnect Rating (Amps) | Disconnect Fuse Type | Enclosure Size | Input Rating (Amps) | Max. Output Rating (Amps)† | Power Loss (Watts)†† | Temp. Rating | VFD Manufacturer Part # |
|----------|-------------------------|-------------------------------|----------------------|----------------|---------------------|----------------------------|----------------------|--------------|-------------------------|
| ACE20 1  | 1                       | 30                            | J                    | 1              | 1.6                 | 2.1                        | 63                   | T6           | 20BD027A0AYNANCO        |
| ACE20 2  | 2                       |                               |                      |                | 2.6                 | 3.4                        | 76                   | T6           |                         |
| ACE20 3  | 3                       |                               |                      |                | 3.9                 | 5.0                        | 93                   | T6           |                         |
| ACE20 5  | 5                       |                               |                      |                | 6.9                 | 8.0                        | 164                  | T6           |                         |
| ACE20 7  | 7.5                     | 30                            | J                    |                | 9.5                 | 11.0                       | 594                  | T4A          | 20BD027A0AYNANCO        |
| ACE20 10 | 10                      |                               |                      |                | 12.5                | 14.0                       | 618                  | T4A          |                         |
| ACE20 15 | 15                      | 60                            | J                    | 2              | 19.9                | 22.0                       | 726                  | T4A          | 20BD065A0AYNANCO        |
| ACE20 20 | 20                      |                               |                      |                | 24.8                | 27.0                       | 794                  | T4A          |                         |
| ACE20 25 | 25                      |                               |                      |                | 31.2                | 34.0                       | 841                  | T4A          |                         |
| ACE20 30 | 30                      |                               |                      |                | 36.7                | 40.0                       | 859                  | T4A          |                         |
| ACE20 40 | 40                      | 100                           | J                    |                | 47.7                | 52.0                       | 1010                 | T4A          |                         |
| ACE20 50 | 50                      |                               |                      |                | 59.6                | 65.0                       | 1117                 | T4A          |                         |

Above data is for a 480V drive. For 600V drive, please consult factory.

†De-rating may be required to account for specific environmental conditions (high ambient temperature, altitude, etc.). Consult factory for de-rating information.

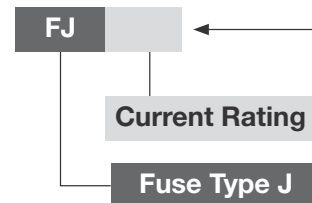
††When not installed in a well ventilated environment, provisions must be made to account for heat generation to ensure proper operation of the device.

### Step 2 – Add Desired Options

| Description                  | Add Suffix      |
|------------------------------|-----------------|
| <b>Communication Modules</b> |                 |
| Profibus                     | CP              |
| Devicenet                    | CD              |
| CAN Open                     | CC              |
| Modbus                       | CM              |
| Ethernet                     | CE              |
| Wireless                     | WL              |
| <b>Options</b>               |                 |
| Potentiometer                | PT              |
| Hand-Off-Auto Switch‡        | RR3             |
| Pushbutton Start-Stop‡       | PB23            |
| 600 VAC VFD                  | Consult Factory |

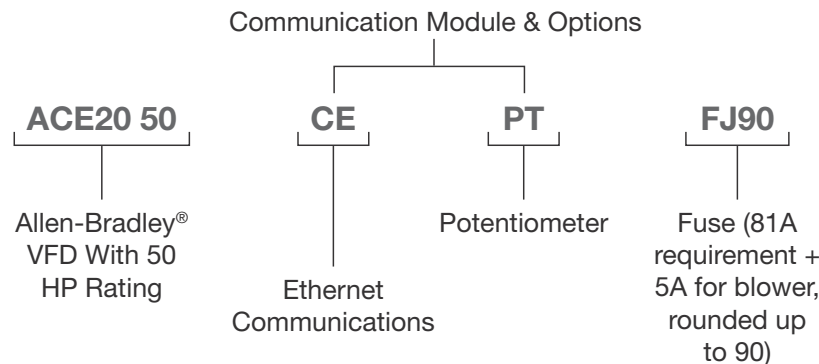
‡RR3 and PB23 cannot be ordered together.

### Step 3 – Add Current Rating for Eaton's Bussmann Fuses



**Note:** Add 5 Amps to your requirements to account for cooling system blower and round up to the nearest increment of 5

### Catalog Number Example:



### ACE Series Recommended Distributor Stock List:

| Description                            | Cat. #    |
|----------------------------------------|-----------|
| Pre-filter and hardware (1 pc.)        | ACE KIT 1 |
| Filter assembly (1 pc.)                | ACE KIT 2 |
| Blower, manifold, and hardware (1 pc.) | ACE KIT 3 |
| Temperature controller (1 pc.)         | ACE KIT 5 |

\*5HP and below listed for Group B.

# ACE20 Series Explosionproof Variable Frequency Drives

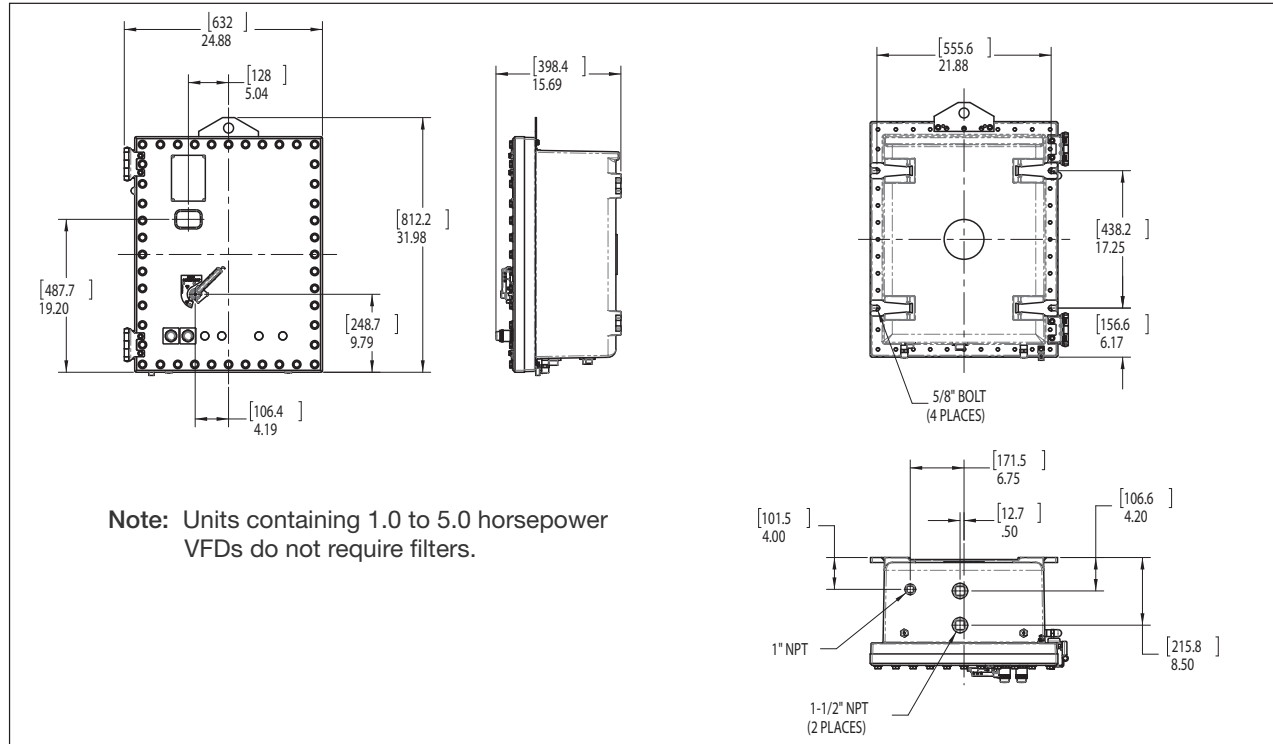
Utilizes Allen-Bradley® PowerFlex  
700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL) NEMA 3, 4X, 7BCD  
Cl. I, Div. 1 & 2, Groups B\*, C, D (cUL) Raintight  
Wet locations

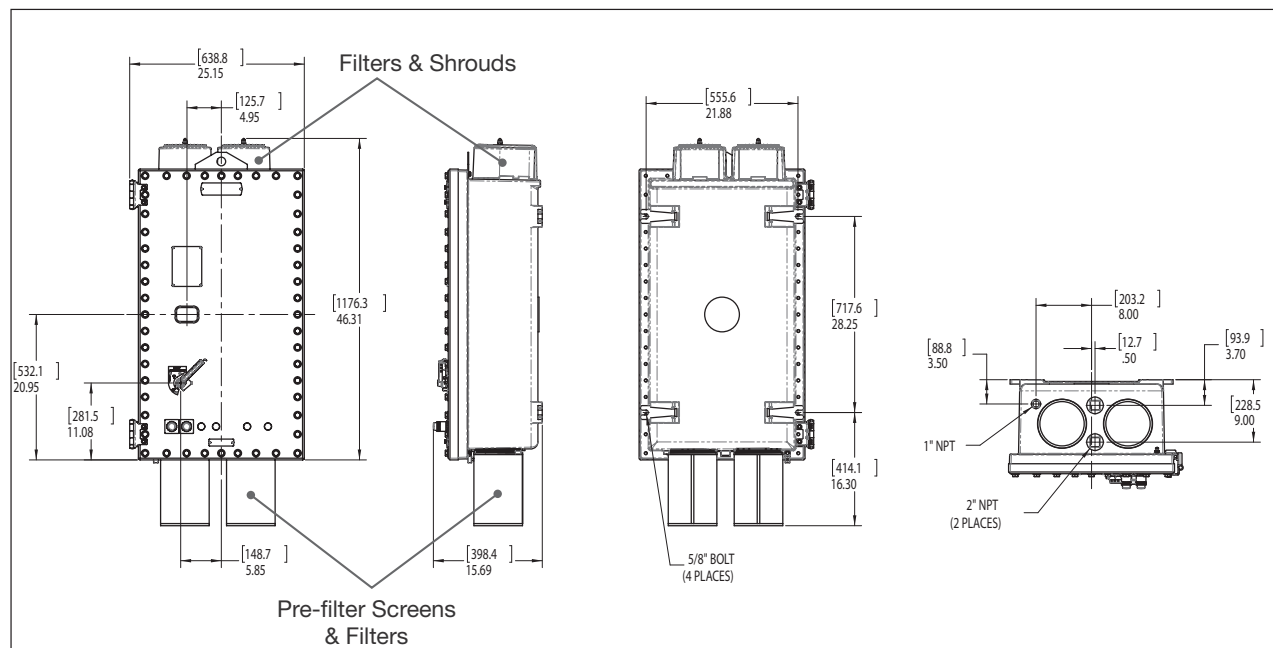
**6C**

## Dimensions

In Inches:



Enclosure Size 1 (1.0 to 5.0 Horsepower VFDs)



Enclosure Size 2 (7.5 to 50.0 Horsepower VFDs)

\*5HP and below listed for Group B.

**Crouse-Hinds**  
by **E.T.N**

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| Description         | Page No.          |
|---------------------|-------------------|
| Specialty Products  | see pages 612–613 |
| Switch Racks        |                   |
| General Information | see pages 614–617 |
| Bus Duct Assemblies | see pages 618–619 |
| Selection Guide     | see pages 620–622 |



## 7C Engineered Solutions

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

### Applications:

- Custom engineered solutions for a wide variety of industrial and commercial applications
- Hazardous and non-hazardous products engineered to application-specific designs and customer requirements

### Capabilities:

- Product selection and application-specific support, including recommendations for material selection, ratings, and protection
- Project bid support
- Engineering design services
- Custom product design
- Value-add packages for: ease of installation, ease of maintenance, labor savings, integrated packages, and portable products

### Certifications and Compliances\*:

- NEC:
  - Class I, Divisions 1 & 2, Groups A, B, C, D
  - Class II, Divisions 1 & 2, Groups E, F, G
  - Class III
- NEMA: 3, 3R, 4, 4X, 7BCD, 9EFG, 12

\*Ratings may not be available or relevant for every proposal.

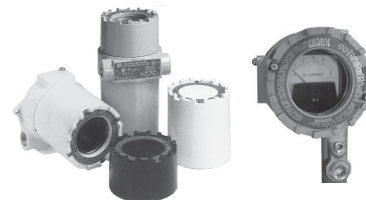
### Labor Saving Solutions:

- Product sub-assemblies and sub-systems
- Pre-fixture products, pre-terminated cables, plugs, fittings, and glands



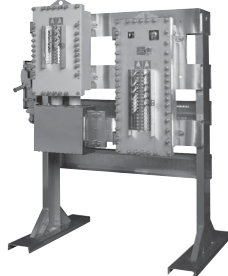
### Integrated Solutions:

- Enclosed metering and instrumentation
- Component populated enclosures
- Custom machining, painting, and legend
- Installed fittings and seals



### Ease of Installation Solutions:

- Rack assemblies - control, distribution, protection, monitoring
- Skid assemblies
- Pre-wired products



### Portable Solutions:

- Power distribution
- Lighting products
- Plugs
- Protection equipment



Interested in a custom engineered product? Contact your local Eaton's Crouse-Hinds sales representative to see how we can design a solution for you. Fill out the request form on the following page to receive a custom quote for your inquiry.

# Engineered Solutions

## Request a Quote

Cl. I, Div. 1 & 2, Groups A, B, C, D  
Cl. II, Div. 1 & 2, Groups E, F, G  
Cl. III  
NEMA 3, 4, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

7C

Customer: \_\_\_\_\_  
Project: \_\_\_\_\_  
Prepared By: \_\_\_\_\_  
Quotation For: ☐ Estimate/Budget ☐ Bid  
Quotation Required By (Date): \_\_\_\_\_

Engineering Firm: \_\_\_\_\_  
Location: \_\_\_\_\_  
Date: \_\_\_\_\_  
☐ Immediate Buy  
Material Required By (Date): \_\_\_\_\_

Is a current copy of plant STDS/SPECS available to Eaton's Crouse-Hinds? \_\_\_\_\_

### Area Classification:

**HAZARDOUS** - Circle all that apply:

☐ Class I ☐ Div. 1 ☐ Div. 2  
Groups B, C, D ☐ B ☐ C ☐ D

☐ Class II ☐ Div. 1 ☐ Div. 2  
Groups E, F, G ☐ E ☐ F ☐ G

☐ Class III

### NON-HAZARDOUS

☐ Ordinary Locations

NEMA Rating ☐ 3R ☐ 4 ☐ 4X

### Dimension Restrictions:

☐ Width \_\_\_\_\_ ☐ Height \_\_\_\_\_  
☐ Depth \_\_\_\_\_

### Service System: (i.e. 480V, 3PH, 3W, 60 Hz)

\_\_\_\_ VOLT \_\_\_\_ PH \_\_\_\_ W \_\_\_\_ HZ \_\_\_\_ AMP

### Products Involved (Select all that apply):

☐ Control & Apparatus ☐ Plugs & Receptacles  
☐ Fittings & Glands ☐ Commercial Products  
☐ Lighting ☐ Other

Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please attach any supporting documentation to this form, including: sketches, single line diagrams, drawings, bill of materials, specifications, etc.

CONTACT: E-mail: [crouse.customerctr@cooperindustries.com](mailto:crouse.customerctr@cooperindustries.com)  
Phone: (866) 764-5454

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 4X, 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

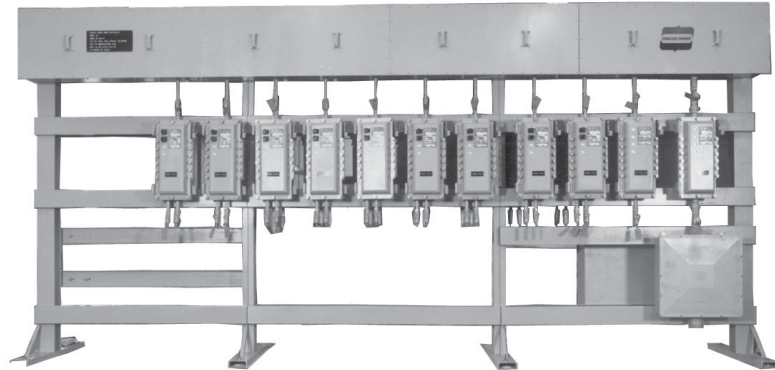
## Applications:

Free-standing switch rack assemblies are used:

- To provide a complete motor control center in one integrated package
- Outdoors and indoors
- In damp, wet or corrosive locations such as sewage treatment plants, lumber mills, marine installations, and food preparation areas
- In areas made hazardous due to the presence of flammable vapors or gases, such as petroleum refineries, chemical and petrochemical plants, gas gathering plants, pipeline compressor stations, and drilling rigs, both onshore and offshore
- In areas where hazardous dusts are present, such as coal handling facilities, grain processing and handling plants, and certain food process industries

## Features:

- Complete factory assembled and wired switch racks
- Pre-drilled bus boxes allow for quick and easy changing or adding of components
- Complete assembly covered under one order, eliminates engineering costs, additional costs of placing separate orders with several vendors for various components, and assembly and scheduling problems at job site
- Wiring is simple. After switch rack is in place, feeders are connected to the main bus and connections made from starters motors. No other field wiring is necessary
- Maintenance time and costs are reduced by having controls grouped. Work is performed in one location instead of moving from one control to another in various locations
- Major components are standard EBM, EPC, NMC, NMG, NCB, FLB, D2PB, EXD, D2D, EPL, and D2L enclosures featuring ready access to starters and breakers for inspection and maintenance
- Custom built racks to meet your exact requirements are an Eaton's Crouse-Hinds specialty. Complete quotations will be supplied for any job, large or small (38' length max)



## Certifications and Complies:

- NEC:
  - Class I, Divisions 1 & 2, Groups C, D (Group B optional)
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 4X (optional), 7B (optional) CD, 9EFG, 12

## Standard Materials:

- Rack frames – structural steel or aluminum channel members, bolted and welded
- Components – see sections A & C for material

## Standard Finishes:

- Rack frame – hot dip galvanized steel or natural aluminum
- Components – see sections A & C for finishes

## Options:

- Rack frame finish – corrosion resistant primer with air dry epoxy
- Options listed for individual components can be incorporated in complete switch racks

# Switch Rack Assemblies

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

7C

## Construction:

### General:

- All construction to be in accordance with current National Electrical Code® (NEC), National Electrical Manufacturers' Association (NEMA), state and local standards as designated by the purchaser.
- All hazardous area enclosures for motor starters, combination motor starters, circuit breakers, motor circuit protectors, instrument enclosures, panelboards, main bus, fittings, receptacles, and lighting fixtures shall be made and supplied by the manufacturer.
- All explosionproof threaded enclosures for combination starters, circuit breakers, motor circuit protectors, and starters shall be UL classified.
- All other standard hazardous area enclosures shall be UL listed or UL classified.
- Manufacturer shall retain permanent records of all motor control racks and shall have the capability of duplicating, or replacing, any fully-assembled rack or rack component.
- Manufacturer to assume responsibility for construction, purchase/manufacturer of components, complete circuit continuity testing, and testing of mechanical functions of components.

## Rack Frame Design:

### Structure:

- Switch rack, either single or double face as required, shall be rigid, free-standing structures. Racks shall be factory-welded, assembled and fabricated from standard rolled structural steel or aluminum shapes.
- Vertical risers will be 6" I-beam and horizontal members shall be 6-inch channel.
- Mounting feet shall be 6-inch channel. Width of such feet for single-sided racks shall be 41 inches.
- End mounting feet will be braced (welded) to the upright with 6" T member.
- Mounting feet shall be anchored at the job site with 1-inch diameter bolts. Anchor bolts and mounting pads will be the responsibility of the user.
- Maximum horizontal spacing between mounting legs shall not exceed 6 feet. (Specific dimensions to be determined by the manufacturer.)
- Racks longer than 20 feet will be supplied as bolt-together sections. (Specific section dimensions to be determined by the manufacturer.)

### Grounding:

- A pressure-type grounding lug with appropriate wire capacity will be provided at each end of frame.

### Finish:

- Rack frame shall be hot-dip galvanized after fabrication or natural aluminum.

## Main Bus Equipment:

### Class I, Division 1:

- Main bus material shall be copper only and capable of withstanding up to 65K amps fault current. Cable bus will be wired to terminal blocks enclosed in cast, copper-free aluminum, explosionproof junction boxes, Eaton's Crouse-Hinds type EJB. Such junction boxes for incoming power and distribution wiring shall be provided at either the top or bottom of the rack. Enclosures shall be connected by rigid conduit with conduit seals installed in accordance with the NEC. Load conduit or cable will leave rack either below or above. Manufacturer shall provide conduit layouts.

### Class I, Division 2:

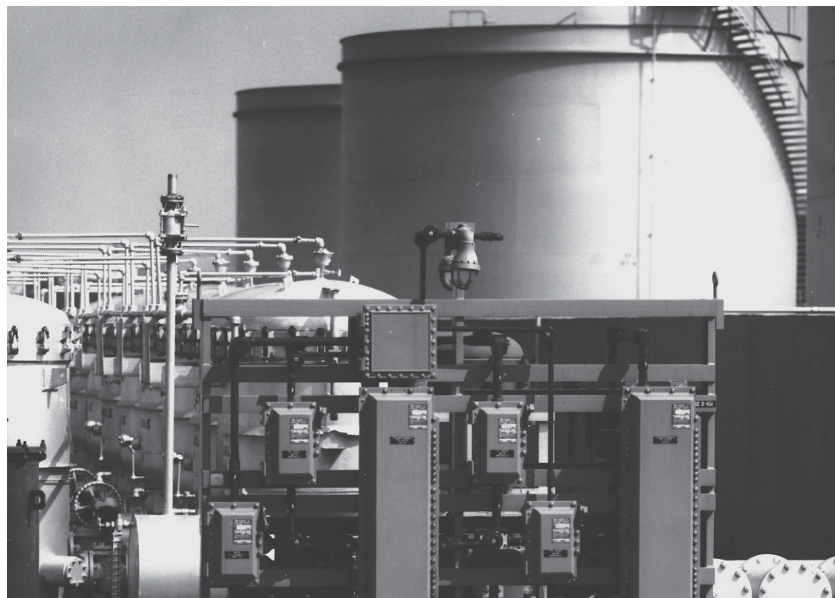
- Main bus material shall be copper only and capable of withstanding up to 65K amps fault current. Cable bus will be wired to terminal blocks enclosed in cast, copper-free aluminum weathertight junction boxes, Eaton's Crouse-Hinds type WJB. Such junction boxes for incoming power and distribution wiring shall be provided at either the top or bottom of the rack. Enclosures shall be connected by rigid conduit with conduit seals installed as required by the NEC. Load conduit or cable will leave rack either below or above. Manufacturer shall provide conduit layouts.

## Bus Duct in Lieu of Junction Boxes (Optional):

- Cable bus will be wired to a weathertight bus duct provided at the top or bottom of the rack.

## Canopy (Optional):

- Single- or double-pitched canopy shall have minimum 15-degree pitch with a minimum 7'6" ground clearance, and 2-foot overhang. Roofing material shall be corrugated aluminum. Canopy roof trusses, cross channels, roof material, and mounting hardware shall be shipped unassembled for quick assembly at the job site. All holes in structure shall be provided except for roof mounting holes which will be drilled in the field. Manufacturer will supply drawings and material for complete field assembly of canopy.



Eaton's Crouse-Hinds switch rack installed in a fuel storage area.

## Crouse-Hinds

by E.T.N

www.crouse-hinds.com US: 1-866-764-5454 CAN: 1-800-265-0502 Copyright© 2013 Eaton's Crouse-Hinds Business

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## Motor Control Components:

### Explosionproof Quick Opening Enclosures:

- All circuit breakers, motor circuit protectors and combination or across-the-line motor starters shall be enclosed in quick-opening enclosures (Eaton's Crouse-Hinds types EBM or EPC).

#### Types:

- Ground joint bolted cover enclosure shall be Eaton's Crouse-Hinds type EBM, Underwriters Laboratories Inc. classified for use in Class I, Groups C, D, Divisions 1 and 2, Class II, Groups E, F, G, Divisions 1 and 2 and Class III hazardous locations and shall also be suitable for Type 3, 3R and/or Type 4 (NEMA 3, 3R and 4) areas.
- All enclosures shall be cast of a corrosion-resistant copper-free aluminum alloy (less than 0.4% copper) and shall be of a semi clamshell design with external flange to promote ease of apparatus installation, adjustment and maintenance. Most importantly, enclosure inside dimensions shall conform to the wire bending space requirements of the National Electrical code NFPA70 paragraph 373-6. Enclosures with flat covers, internal flanges or those not conforming to NFPA70 paragraph 373-6 are not permitted.
- Covers shall be hinged on the left side and, when closed, shall be affixed top the body by multiple lead thread bolts to promote quick opening and closing of the enclosure.
- Cover bolts shall be hex head stainless steel without screwdriver slots, to promote the use of a socket or wrench for proper tightening. They shall be captive to the cover and stainless steel spring loaded to indicate the fully unthreaded position. Spring loading shall give visual indication that the bolts are free of the body when the cover is being opened. The cover flange ground joint shall have an integral gasket to prevent the entry of windblown dust, rain or sleet.
- All enclosures shall be fitted, as standard, with adjustable, extended, corrosion-resistant, copper-free aluminum hinges that shall allow the cover to swing away from the body when opened and shall permit unobstructed working space for maintenance, adjustment or replacement of the internal apparatus. Additionally these hinges shall allow minimum enclosure-to-enclosure spacing with little interference between an open cover and an adjacent enclosure. Enclosures with hinges fabricated from steel or aluminum stampings shall not be permitted.
- All enclosures shall be provided with drilled, tapped and plugged conduit entrances suitably sized for the electrical application. Power conduit entrances shall be located 1 (or 2) each on (or equally spaced from) the enclosure vertical centerline at top and bottom. A single, plugged 1" entrance for a control conduit shall be provided at the bottom of the enclosure. (Some enclosures can also be provided with a plugged 1" entrance for control conduit at the top.)
- All conduit entrances shall be furnished with removable copper-free aluminum reducers, each with integral wire pulling bushing. All conduit entrances shall be located the same distance from the enclosure mounting surface to facilitate conduit run layout and/or stub up construction.
- All enclosures shall have rugged, cast copper-free aluminum circuit breaker and motor starter overload reset operating handles located on the right side of the enclosure. These handles shall operate the internal mechanisms via stainless steel, gasketed shafts and bearings through the side wall of the body. Correct circuit breaker and overload reset operation shall be visually confirmed with the cover open.
- Circuit breaker handles shall be padlockable in either the "OFF" or "ON" position, and shall be trip-free of the circuit breaker itself. An attached indicating plate shall give clear, visual confirmation of the circuit breaker status.
- Adjustable circuit breaker handle stops shall be provided to ensure full operation of the circuit breaker and to prevent handle overthrow that could damage the circuit breaker toggle.
- Motor starter overload reset operating mechanisms shall be field adjustable.
- Threaded construction enclosures shall be Eaton's Crouse-Hinds type EPC, Underwriters Laboratories, Inc. classified for use in Class I, Groups C, D, Divisions 1 and 2, Class II, Groups E, F, G Divisions 1 and 2 and Class III hazardous locations and shall also be suitable for Type 3, 3R and/or Type 4 (NEMA 3, 3R and 4) areas.
- All enclosures shall be cast of a corrosion-resistant copper-free aluminum alloy (less than 0.4% copper) and shall be of a three section design. Multiple-start straight buttress threads between the covers and the body shall ensure quick access to the interior in less than two full turns of the covers. A system of stops shall prevent overtightening and thread seizing. A system of locks shall prevent covers from loosening due to external vibration.
- Female threads on the top cover with male threads on the bottom cover shall ensure inherent water and rain shedding.
- All exposed screws, bolts and hardware shall be stainless steel.
- The external circuit breaker operating handle affixed to a stainless steel shaft, shall be padlockable in either the "ON" or "OFF" position with up to three padlocks. Circuit breaker mechanisms shall be trip-free of the circuit breaker itself to allow the circuit breaker to open under overload conditions even if it is locked in the "ON" position.
- The mounting bracket shall provide a three-point suspension system for quick installation and adjustment.
- Conduit entrances shall have integral wire pulling bushings and conduit stops. These openings shall be arranged two at the top and two at the bottom and shall be sized for power and control requirements.

### General:

- All enclosures shall be bolted to the horizontal frame members on either the front or back or both front and back. Enclosures shall be connected to the main bus via conduit seals. (To be field poured). All hardware used to mount the enclosures shall be stainless steel.



## Lighting Panelboards:

### Class I, Division 1:

- Panelboards shall be Eaton's Crouse-Hinds type, factory-sealed EXD or EPL as specified and shall meet the following electrical ratings:  
EPL – 1, 2 or 3 pole, 240 volt maximum, 100 amp maximum branch trip rating, 10,000 AIC.  
EXD – 1, 2 or 3 pole, 600 volt maximum, 100 amp maximum branch trip rating.

### Class I, Division 2:

- Lighting panelboard shall be Eaton's Crouse-Hinds type D2L factory-sealed, 120 / 240 volt panelboards and be provided with single-pole, two-pole, or three-pole branch circuit breakers with up to 100 amp trip rating; main breaker ranging to 225 amp. Similarly, lighting panelboard shall be type D2PB factory-sealed, 120 / 240 volt panelboards and be provided with single-pole or two-pole factory sealed circuit breakers with 15, 20 or 30 amp trip ratings and maximum 10,000 AIC. Power panelboards type D2D factory-sealed, up to 600 volt are provided with single-pole, two-pole, or three-pole branch circuit breakers with up to 100 amp trip ratings; main breaker rating to 225 amp.

## NEMA 4X Option:

- All bus boxes, control enclosures and lighting panelboards will be made of KRYDON® material to meet NEMA 4X requirements.

## Fittings:

- All fittings shall be made and provided by the manufacturer. Seals and unions will be provided for each incoming and outgoing conduit as required. All interconnections between components shall be done by the manufacturer with galvanized rigid conduit, and conduit fittings as required to meet the hazardous classification. Interconnecting conduits to be provided with conduit seals as required. All incoming and outgoing rack conduit entrances shall include conduit seals as required by the hazardous location specified. Such seals will be provided by the manufacturer and will not be filled where field wiring is to be introduced.

## Conduit Boxes, Outlet Boxes, Device Boxes:

- Conduit boxes, outlet boxes, and device boxes shall be Eaton's Crouse-Hinds *Condulet*® fittings.

### Seals:

- Seals will be standard Eaton's Crouse-Hinds type *Condulet* EYS. (Eaton's Crouse-Hinds *Condulet* EYD drains to be specified as required.)

### Unions:

- Unions will be Eaton's Crouse-Hinds UNY.

### Breathers and Drains:

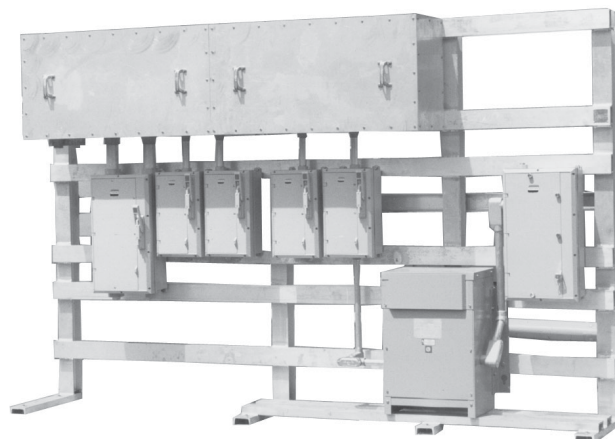
- Breathers and drains shall be Eaton's Crouse-Hinds ECD.

## Wiring:

- Standard wire shall be copper only, 600 volt, 75°C minimum rating, UL listed.
- No power wire less than 12AWG shall be used.
- Control wire shall be 14AWG minimum, 7 strands, THW minimum.
- Wiring shall be sized in accordance with the NEC requirements.

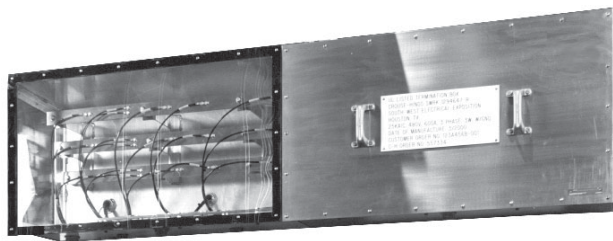
## Drawings:

- Standard drawings supplied for customer approval shall include complete rack wiring diagram, component data, nominal weight of the rack, and overall rack dimensions.



## Applications:

- Eaton's Crouse-Hinds is now offering NEMA 3R, UL Listed Bus Duct (Termination Box) Assemblies as standard product. Up to 600V, three-phase, 3 or 4 wire, 400Amp or 600Amp service with short circuit ratings of 25K or 50K.
- Bus ducts or termination boxes provide a means of tapping feeder circuits for power distribution on outdoor switchrack assemblies or indoor wall-mounted applications.
- Typical application is primarily for bus replacements on existing switchrack installations. New applications may include on-site construction of switchracks or indoor feeder distribution points due to space confinements making local installation more practical.



## Features:

- UL Listed.
- NEMA 3R.
- Maximum voltage rating 600V.
- 400 Amp or 600 Amp @ 25KAIC or 50KAIC.
- External flange on bus duct enclosure and lip on covers prevents water leakage and allows covers to hang freely for ease of installation and maintenance.
- 3 degree pitch at top, for water run-off, on all flush mounted bottom entry designs.
- Chlorosulfonated polyethylene (Hypalon®) gasket material at all bus box section joints, covers and end plates.
- Standoff (Glastic) insulators molded of (UL) recognized flame-resistant fiberglass-reinforced thermoset polyester molding compound.
- Bus bar sizing and bracing complies to UL857 requirements.
- All welded construction - sheet aluminum, sheet steel (galvanized), or stainless steel.
- Stainless steel hardware throughout.
- Two hole compression lugs at all power phase connectors attached with stainless steel hardware.
- One (1) drain is standard per bus duct section (typical 4 foot sections).
- Solid copper bus bars (tin, silver plated and/or insulated – optional per customer request).
- Solid copper ground bar – standard.
- Incoming main lugs – supplied size and location specified with customer.
- Space heaters – optional per customer request.
- Pre-drilled copper bars (when specified by customer).
- Conduit entries for Myers hubs – optional per customer request.

**7C**

7C

## Selection Guide

Cl. I, Div. 1 & 2, Groups B, C, D  
 Cl. II, Div. 1, Groups E, F, G  
 Cl. II, Div. 2, Groups F, G  
 Cl. III  
 NEMA 3, 4X, 7BCD, 9EFG, 12

Explosionproof  
 Dust-Ignitionproof  
 Raintight  
 Wet Locations  
 Watertight

Customer: \_\_\_\_\_ Engineering Firm: \_\_\_\_\_  
 Project: \_\_\_\_\_ Location: \_\_\_\_\_  
 Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Quotation For: ☐ Estimate/Budget ☐ Bid ☐ Immediate Buy  
 Quotation Required By (Date) \_\_\_\_\_ Material Required By (Date) \_\_\_\_\_

Interested in a highly reliable, comprehensive communications that will improve the operating efficiency of your facility? See additional information at the end of this guide.

Is a current copy of plant STDS/SPECS available to Eaton's Crouse-Hinds? \_\_\_\_\_

**Area Classification:**

**HAZARDOUS** - Circle All that apply:

- ☐ Class I  
 Div. 1 or 2, Grps B, C & D  
☐ Class II  
 Div. 1 or 2, Grps E, F & G  
☐ Class III

**NON-HAZARDOUS**

- ☐ Ordinary Locations  
☐ NEMA 3R, 4, 4X (Circle One)

**Structural Frame:****MATERIAL**

- ☐ Steel  
☐ Aluminum  
☐ Single Face  
 (Components on ONE side only)  
☐ Double Face  
 (Components on BOTH sides)  
☐ Other \_\_\_\_\_  
☐ Percent Spare Space \_\_\_\_\_ %

**FINISH**

- ☐ Hot Dip Galvanized  
☐ Painted

**Roof Canopy:**

- ☐ Yes ☐ No  
☐ Corrugated Aluminum  
☐ Corrugated Fiberglass

**Enclosure Type:**

- ☐ Bolted ☐ Threaded  
☐ Krydon ☐ Epoxy Coated

**Dimension Restrictions:**

- ☐ Length \_\_\_\_\_ ☐ Height \_\_\_\_\_

**Service System:** (i.e. 480V, 3PH, 3W, 60HZ)

\_\_\_\_\_ VOLT \_\_\_\_\_ PH \_\_\_\_\_ W \_\_\_\_\_ HZ

**Incoming Feeder Requirements:**

- \_\_\_\_\_ # Conductors/Phase  
 \_\_\_\_\_ # AWG/MCM  
 \_\_\_\_\_ # Inch Conduit (Size)  
☐ Top Entry ☐ Bottom Entry

**Main Bus Enclosure:****MATERIALS**

- ☐ Steel  
☐ Aluminum  
☐ Other (Specify) \_\_\_\_\_  
☐ Bus Location - Top of Rack  
☐ Bus Location Bottom of Rack  
☐ Bus Bracing \_\_\_\_\_ (25 KAIC Standard)  
☐ Bus Amps \_\_\_\_\_  
☐ Other - Customer to Specify

**FINISH**

- ☐ Hot Dip Galv.  
☐ Painted

**MAIN BUS CHARACTERISTICS**

- Copper Bars  
☐ Bare (Standard) ☐ Power Distr. Block  
☐ Insulated ☐ Ground Bus in Enclosure  
☐ Silver Plated  
☐ Tin Plated

# Switch Rack Assemblies

## Selection Guide

Cl. I, Div. 1 & 2, Groups B, C, D  
Cl. II, Div. 1, Groups E, F, G  
Cl. II, Div. 2, Groups F, G  
Cl. III  
NEMA 3, 4X, 7BCD, 9EFG, 12

Explosionproof  
Dust-Ignitionproof  
Raintight  
Wet Locations  
Watertight

7C

### Main Breaker/Disconnect: (3C,N)

☐ None ☐ Molded Case Breaker  
AIC Rating \_\_\_\_\_  
Amp Trip (AT)/ \_\_\_\_\_ Amp Frame (AF) \_\_\_\_\_  
☐ Disconnect Switch  
\_\_\_\_\_ Amps  
☐ Fused ☐ Non-Fused

### Equipment Requirements:

#### COMBINATION MOTOR STARTERS (1C, N)

FVNR, Reversing, 2-speed (circle one)  
Qty. \_\_\_\_\_

\_\_\_\_\_ NEMA Size 0 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 1 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 2 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 3 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 4 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 5 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP  
\_\_\_\_\_ NEMA Size 6 with \_\_\_\_\_ AT/ \_\_\_\_\_ AF, \_\_\_\_\_ MCP

Refer to Eaton's Crouse-Hinds catalog for suggested breaker or motor circuit protector sizing if not specified above, Eaton's Crouse-Hinds will size accordingly.

#### OPTIONS REQUIRED

\*Unless specified differently \*options furnished standard

|                                                            | Yes   | No    |
|------------------------------------------------------------|-------|-------|
| *Fused Control Transformer<br>Suffix FTPS                  | _____ | _____ |
| Space Heaters<br>Suffix R11, R22, R44                      | _____ | _____ |
| Start/Stop Pushbuttons<br>Suffix PB23                      | _____ | _____ |
| Hand-Off Auto Selection Switch<br>Suffix RR3               | _____ | _____ |
| Red Indicating Light Suffix J1                             | _____ | _____ |
| Green Indicating Light Suffix J3                           | _____ | _____ |
| *Auxiliary Contacts: (2 N.O./2NC)<br>Suffix S782           | _____ | _____ |
| Control Relay<br>Suffix S787                               | _____ | _____ |
| *Breather/Drain Suffix S198V/S756V                         | _____ | _____ |
| *12 Point Terminal Block<br>Other - Specify<br>Suffix S786 | _____ | _____ |

‡ Not available with D2PB panelboards.

### Feeder Circuit Breaker: (3C, N)

AIC Rating \_\_\_\_\_  
Qty \_\_\_\_\_ (AT) \_\_\_\_\_ (Specify) \_\_\_\_\_  
\_\_\_\_\_ /100/150 AF  
\_\_\_\_\_ /100/150 AF  
\_\_\_\_\_ /225/250 AF  
\_\_\_\_\_ /400 AF  
\_\_\_\_\_ /800 AF  
\_\_\_\_\_ Other

### Component Preference:

☐ Cutler-Hammer ☐ SQD ☐ A-B ☐ GE  
(Cutler-Hammer will be used if no preference is indicated.)

### Distribution Transformers:

\_\_\_\_\_ KVA \_\_\_\_\_ PH \_\_\_\_\_ Volt-Pri \_\_\_\_\_ / \_\_\_\_\_ Volt-Sec  
\_\_\_\_\_ KVA \_\_\_\_\_ PH \_\_\_\_\_ Volt-Pri \_\_\_\_\_ / \_\_\_\_\_ Volt-Sec  
☐ Copper Windings ☐ Stainless Steel Enclosure

### Panelboards: (1A, N)

#### Power (480V) (D2D EXD)

☐ Single Phase ☐ Three Phase  
Main Breaker \_\_\_\_\_ Pole \_\_\_\_\_ AT  
Branch Circuits  
Qty \_\_\_\_\_ AT \_\_\_\_\_ No. Poles (i.e. '2P'-2 = Pole)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### LIGHTING/HEAT TRACING

(240/120V) (D2L, EPL, D2PB)

☐ Single Phase ☐ Three Phase  
Main Breaker \_\_\_\_\_ Pole \_\_\_\_\_ AT  
Branch Circuits  
Qty \_\_\_\_\_ (AT) \_\_\_\_\_ No. Poles (i.e. '2P'=2 Pole)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

‡ GFI (5mA) \_\_\_\_\_ AMP  
(No. Req'd) \_\_\_\_\_ Rating \_\_\_\_\_  
‡ EPD (30mA) \_\_\_\_\_ AMP  
(No. Req'd) \_\_\_\_\_ Rating \_\_\_\_\_

## Selection Guide

Cl. I, Div. 1 & 2, Groups B, C, D Explosionproof  
 Cl. II, Div. 1, Groups E, F, G Dust-Ignitionproof  
 Cl. II, Div. 2, Groups F, G Raintight  
 Cl. III Wet Locations  
 NEMA 3, 4X, 7BCD, 9EFG, 12 Watertight

**Lighting Contactor:**

☐ Yes ☐ No  
 No. Poles \_\_\_\_\_ Amp Rating \_\_\_\_\_  
☐ Control Power Transformer  
 Suffix FTFS  
☐ Hand-Off-Auto Selector Switch  
 Suffix RR3

**Photocell:**

☐ Yes ☐ No

**Lighting Fixtures:** (1L, 2L, 3L)

Quantity \_\_\_\_\_ Type \_\_\_\_\_  
 Wattage \_\_\_\_\_ Voltage \_\_\_\_\_

**Receptacles:**

☐ Convenience Receptacle  
 Amps \_\_\_\_\_ Poles \_\_\_\_\_ Volts \_\_\_\_\_  
☐ Welding Receptacle  
 Amps \_\_\_\_\_ Poles \_\_\_\_\_ Volts \_\_\_\_\_  
 Integral Circuit Breaker ☐ Yes ☐ No

**Conduit Fittings, Seals, Unions:**

Plant Standard \_\_\_\_\_ (i.e. "Form 7")  
☐ Iron ☐ Aluminum  
 Type Seals  
 (Note seals not poured at factory)  
☐ EYD ☐ EYS ☐ EZD  
☐ Other (specify) \_\_\_\_\_

**Conduit:**

☐ Rigid Galv. Steel ☐ Aluminum  
☐ PVC Coated

**Wiring:**

☐ RHW/RHH ☐ THWN/THHN (C-H Std)  
☐ THW ☐ XHHW  
☐ Other Insulation - Specify \_\_\_\_\_

**Shop Inspection & Tests:**

☐ Mfr. Standard Tests  
☐ Customer In Plant Final Inspection  
☐ Yes ☐ No

**Special Requirements:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_