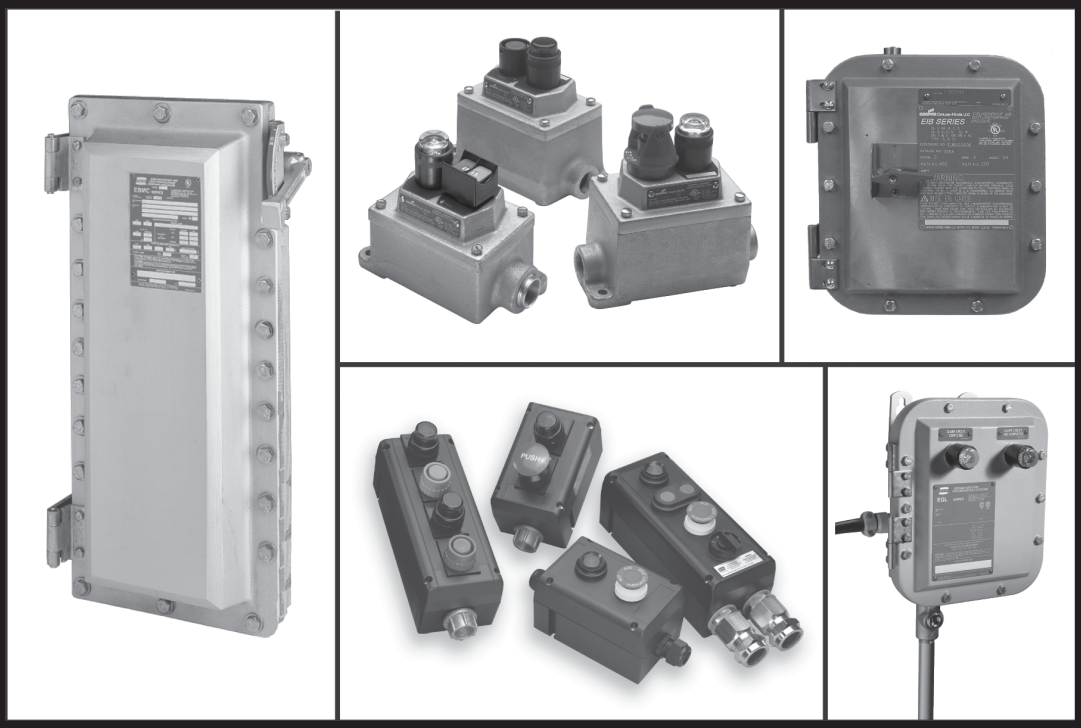
Industrial Control & Circuit Breakers

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	Section
• EMN Series Pushbutton Style Compact Manual NEMA Starters	2C
• EMN Series Pushbutton Style Compact Manual IEC Starters	2C
• GUSC Enclosures with Manual Motor Starters	2C
• XLC Explosionproof Lighting Contactors	5C
• DSD-TS Series Timers	5C
• ACE20 Series Explosionproof Variable Frequency Drives	6C
• Engineered Solutions	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:

Crouse-Hinds by EATON

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/ EEMAC Starters	Manufacturers Equipment Enclosed		
Enclosures	**NEC/CEC – Hazardous Area Certifications and Compliance**	**NEMA/EEMAC Enclosure Type**	**Single Speed Non-Reversing**	**Starter**	**Breaker/Switch**	**Cover Type**
EBMC	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	3, 4*, 7BCD, 9EFG, 12	0 – 5	Allen-Bradley G.E. Square D Cutler-Hammer	G.E. Square D Cutler-Hammer	Bolted/Ground Joint/Gasketed
EPC	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	3, 4, 7CD, 9EFG, 12	0 – 3	Allen-Bradley G.E. Square D Cutler-Hammer	G.E. Square D Cutler-Hammer	Threaded
NMC	—	3, 4X, 12	0 – 4	Allen-Bradley G.E. Square D Cutler-Hammer	G.E. Square D 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‡, 4X††, 7BCD, 9EFG, 12

Explosionproof
Dust-Ignitionproof
Raintight
Wet Locations
Watertight

Applications:

Spectrum™ EBM hinged cover motor control enclosures are used:

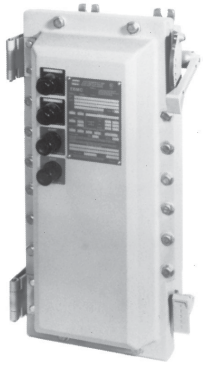
- For general motor control and circuit protection – indoors and outdoors – in damp, wet, dirty, dusty hazardous locations without the need for a protective shelter
- In areas where frequent washdowns are necessary or where heavy rain or water spray is prevalent
- For across-the-line starting, stopping, 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‡, 4X††, 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)

EBMC Combination Line Starters 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, 3R, 4‡, 4X††, 7BCD, 9EFG, 12	Watertight

Options:

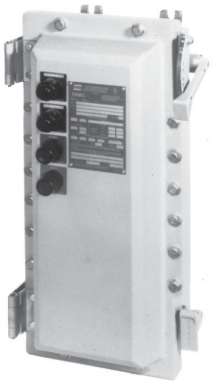
The following options are available from the factory by adding suffix to catalog number – suffixes are added alphanumerically.

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	**AC**
• 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 provided)	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 provided)	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 provided)	①	**FTPS300**
• Pilot light, 120VAC, red jewel, w/blank indicating plate	①	**J1**
• Pilot light, 120VAC, green jewel, w/blank indicating plate	①	**J3**
• LED pilot lights (in place of standard incandescent lamps)	①	**LED**
• Less heaters in starter overload relay	②	**0**
• Start-Stop pushbuttons (requires 2 spaces)	①	**PB23‡**
• On-Off selector switch	①	**RR2‡**
• Hand-Off-Auto selector switch	①	**RR3‡**
• 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**
• Insulated neutral w/2 connectors	①	**S146**
• Std. drain, Class I, B,C & D; Class II, E, F & G; Class III	①	**S756‡**
• Std. breather & drain, Class I, B,C & D; Class II, E, F & 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.)		
Auxiliary contacts on starter 1 N.O. & 1 N.C.	②	**S781**
Auxiliary contacts on starter 2 N.O. & 2 N.C.	②	**S782**
Auxiliary contacts on starter 3 N.O. & 3 N.C.	②	**S783**
• Auxiliary switch on Circuit Breaker 1A and 1B contacts	②	**S784**
• Auxiliary switch on Circuit Breaker 2A and 2B contacts	②	**S785**
• 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 hertz	①	**S787***

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

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**
Close	**DSL21**
Down	**DSL23**
Emerg. Stop	**DSL17**
Fast	**DSL46**
Forward	**DSL18**
Hand	**DSL15**
In	**DSL24**
Jog	**DSL10**
Lower	**DSL27**
On	**DSL07**
Off	**DSL08**
Open	**DSL20**
Out	**DSL25**
Power On	**DSL14**
Raise	**DSL26**
Reset	**DSL12**
Reverse	**DSL19**
Run	**DSL09**
Safe	**DSL85**
Slow	**DSL47**
Start	**DSL05**
Stop	**DSL06**
Test	**DSL13**
Trip	**DSL11**
Up	**DSL22**

Two Function Legend Plates

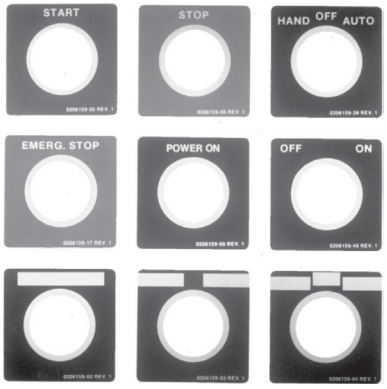
Marking	Cat. #
Blank with 2 fields	**DSL03**
For-Rev	**DSL30**
Hand-Auto	**DSL29**
In-Out	**DSL35**
Off-On	**DSL48**
Open-Close	**DSL32**
Raise-Lower	**DSL36**
Run-Jog	**DSL28**
Safe-Run	**DSL86**
Start-Stop	**DSL37**
Slow-Fast	**DSL65**
Up-Down	**DSL33**

Three Function Legend Plates

Marking	Cat. #
Auto-Off-Hand	**DSL49**
Blank with 3 fields	**DSL04**
Fast-Off-Slow	**DSL41**
For-Off-Rev	**DSL40**
Hand-Off-Auto	**DSL39**
Run-Off-Jog	**DSL38**
Open-Off-Close	**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



‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.
††With S752 or S753.

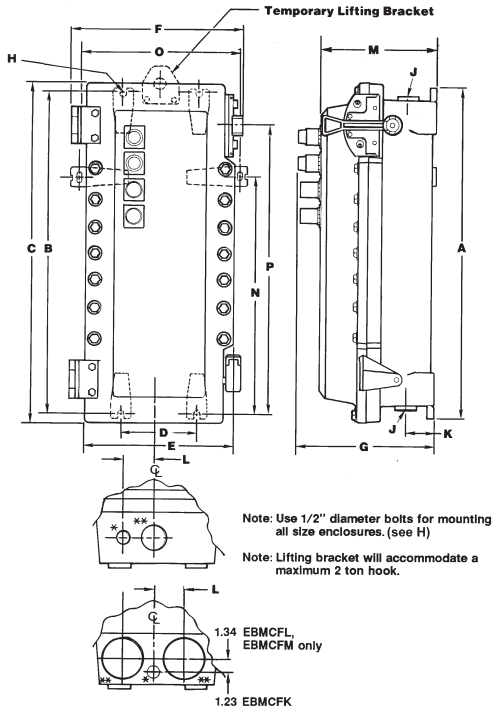
EBMC Combination Line Starters and Enclosures

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&T✪	w/RE	K	L	M	N	O	P
Size 0, 1 FVNR combination line starter§																
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
Size 2 FVNR combination line starter																
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
Size 3 FVNR combination line starter																
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
Size 4 FVNR combination line starter																
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
Size 5 FVNR combination line starter																
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.

Crouse-Hinds by EATON

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‡, 4X††, 7BCD, 9EFG, 12

Explosionproof
Dust-Ignitionproof
Raintight
Wet Locations
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 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 FTPS option.
Ex. EBMC0FB-①30②32-③613 becomes EBMC0FB-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.

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	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, 3R, 4‡, 4X††, 7BCD, 9EFG, 12	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:

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

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

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 Polyphase	Volts	NEMA Size	MCP Amp Rating	Enclosure without Starter & MCP Cat. #	Enclosure with Starter & 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. Frame	250 Amp. Frame	400 Amp. Frame
Cutler-Hammer	HMCP (F-Frame)	HMCP (J-Frame)	HMCP (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
Cutler-Hammer (WP)		
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
General Electric (TP)		
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
Square D (DP)		
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

1C EPC Combination 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

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

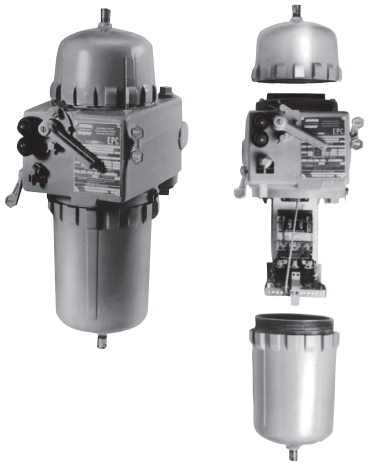
Electrical Rating Range:

- 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 600/480/240–120 volts, 50 or 60 hertz (Sizes 0 and 1 – 100–50 VA)	
Fusible – Secondary	**FT**
Fusible – Primary and secondary	**FTPS**
Auxiliary Contacts on Starter or 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 Motor Circuit Protector*	
1A/1B (1P2T)	**S784**
2A/2B (2P2T)	**S785**
Side bosses drilled and tapped same size as standard hubs (except 15" dia. – 1" size)	**S366**
Back boss drilled and tapped same size as standard hubs (except 15" dia. – 1" size)	**S367**
Pushbuttons (heavy duty):	
START-STOP	**PB3**

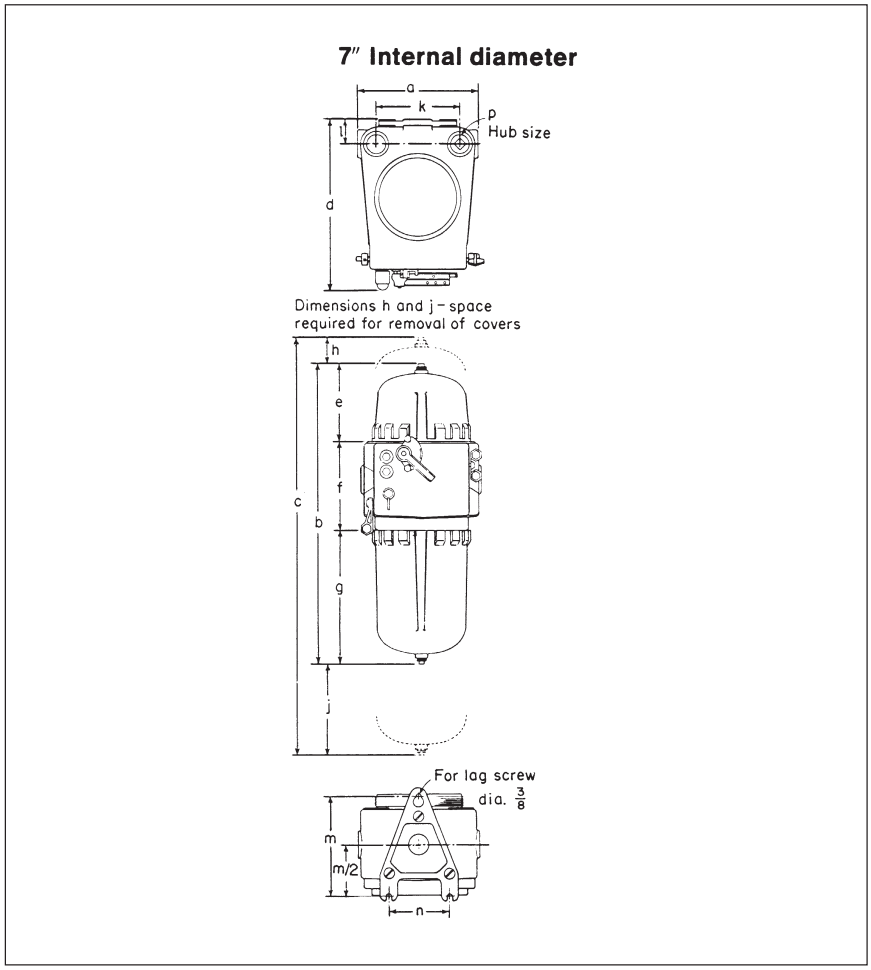


Assembled unit **Separated view showing major components**

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 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 contactor)	**CL**
Less overload relays (motor contactor)	**CM**
Separate AC control circuit	**Specify**
Insulated neutral with 2 connectors (50, 100 & 225 amp)	**S146**
Grounded neutral stud with 3 connectors (50, 100 & 225 amp)	**S178**
Pilot light holes drilled, tapped and plugged for future addition of pilot lights	
One hole	**S541**
Two holes	**S542**
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‡**
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 EATON



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

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

*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			
Max. HP Polyphase	Volts	NEMA Size	Amp Rating	Frame	Hub Size in.	Int. Dia. in.	Without Starter & Circuit Breaker Cat. #	With Starter & Circuit Breaker Cat. # §
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.

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 Polyphase	**Volts**	**NEMA Size**	**Amp 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.

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 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**
Auxiliary Contact on Starter or Contactor*	
1NO/1NC	**S781**
2 NO/2 NC	**S782**
3 NO/3 NC	**S783**
Auxiliary Switch on Circuit Breaker or Motor Circuit Protector*	
1A/1B	**S784**
2A/2B	**S785**
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	**LVR4†**

Description	Suffix
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 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 block for grounded or ungrounded neutral can be supplied	**S618**
Hubs (see "NOTE ON HUBS") – see page 677	
Grounding plate or bushing – 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	¾
1	1	¾
	2	1
2	1	¾
	2	1½
3	1	¾
	2	2
4	1	¾
	2	2½

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 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 ①15EHB 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 ①20EHB 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 ①30EHB 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 ①40EHB 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 ①60EHB 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 ①70EHB 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 ①80EHB 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 ①80EHB 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 ①100EHB 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:

		Frames 100/150A			225/250A
Manufacturer	Symbol	240V	480V	600V	600V
General Electric	TT	TEB	TED§	TED§	TFJ
Square D	DT	FAL§	FAL§	FAL§	KAL
Cutler-Hammer	WT	EB	EHB, 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"

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 Polyphase	Volts (AC)	NEMA Size	MCP Trip Setting Amps	With Starter & MCP Cat. #§	Without Starter & 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

②Motor Starters:

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

Information on other starter manufacturers on request.

NOTE ON HUBS: See page 458.

§ With motor circuit protector only. For motor circuit protector with current limiter – information 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 Disconnect Switch	Enclosure	
Max. HP Polyphase	Volts (AC)	NEMA Size	Switch Size-Amps	With Starter & Disconnect Switch Cat. #	Without Starter & Disconnect Switch 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

②Motor Starters:

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

Information on other starter manufacturers on request.

NOTE ON HUBS: See page 458.

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

②Motor Starters:

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

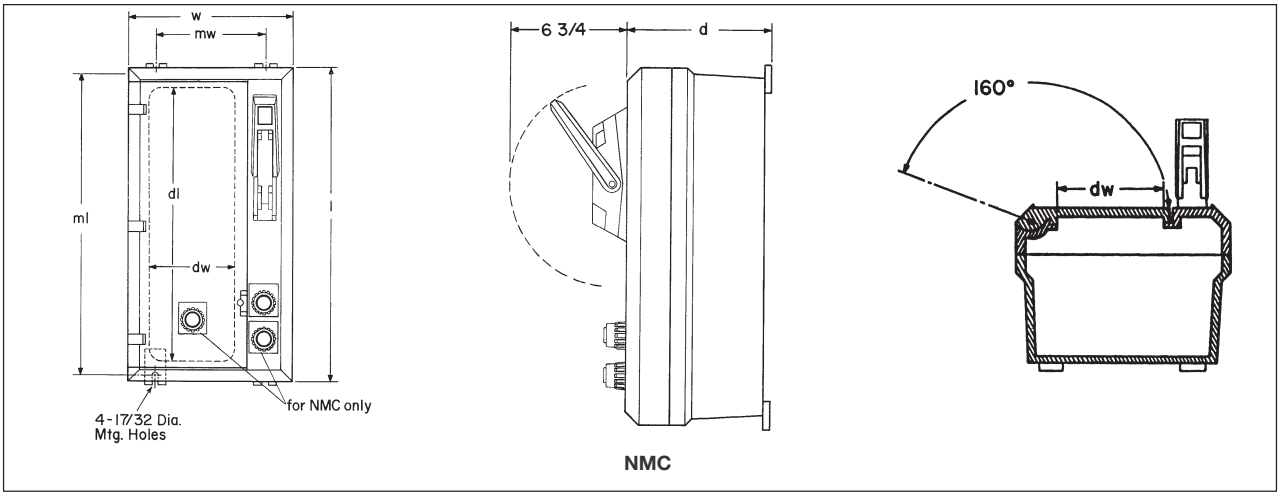
Information on other starter manufacturers on request.

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.

1C NMC Combination Line Starters and Enclosures

Dimensions
In Inches:



NMC

Cat. #	Outside Dimensions l	w	d	Mounting Dimensions mw	ml	Door Opening Dimensions dl	dw
NMC1024	25 13/32	11 13/32	8 23/32	7 7/8	25 3/8	22 7/8	5 11/16
NMC1426	27 13/32	15 13/32	9 23/32	11 7/8	27 1/4	23 11/16	9 11/16
NMC2426	27 13/32	25 13/32	9 23/32	21 3/4	27 1/4	23 11/16	19 11/16

2C Motor Starters

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 Cl. II, Div. 1, Groups E, F, G Cl. II, Div. 2, Groups F, G Cl. III	3, 4, 7CD, 9EFG, 12	Magnetic	0-2	Poly-AC	Allen-Bradley Cutler-Hammer G.E. Square D	Threaded
EBMS	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	3, 4, 7BCD, 9EFG, 12	Magnetic	0-5	Poly-AC	Allen-Bradley G.E. Square D Cutler-Hammer	Bolted/ Ground Joint/ Gasketed
EMN NEMA	Cl. I, Div. 1 & 2, Groups C, D Cl. II, Div. 1 & 2, Groups E, F, G Cl. III	3, 4, 4X†, 7(CD), 9(EFG)	Manual	0-1P	DC and Single and Poly-AC	G.E. Square D	Bolted
EMN IEC	Cl. I, Div. 1 & 2, Groups C, D Cl. II, Div. 1 & 2, Groups E, F, G 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 Cl. II, Div. 1, Groups E, F, G Cl. II, Div. 2, Groups F, G Cl. III	3, 7CD, 9EFG, 12	Manual	0-1P	Single and Poly-AC	Allen-Bradley Cutler-Hammer G.E. Square D	Bolted/ Ground Joint
GUSC	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	3, 7CD, 9EFG, 12	Manual	3, 7½, 15, 20	Single-AC		Threaded
EDS, EDSC‡	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	3, 7CD, 9EFG, 12	Manual		DC and Single AC	Allen-Bradley G.E. Cutler-Hammer	Bolted/ Ground Joint
EFD	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	3, 7BCD, 9EFG, 12	Manual		DC and Single and Poly-AC	G.E. Square D	Bolted/ Ground Joint
NSSC / NFSC	None	3, 4X, 12	Manual		DC and Single and Poly-AC	Allen-Bradley G.E. Square D Cutler-Hammer	Screw and gasket
NMN	None	3, 4X, 12	Manual	0-1P	Single AC	Allen-Bradley G.E. Square D	Screw and gasket
NMG	None	3, 4X, 12	Manual	0-4	Poly-AC	Allen-Bradley G.E. Square D Cutler-Hammer Westinghouse	Hinged, screw and 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‡, 4X††, 7BCD, 9EFG, 12

Explosionproof
Dust-Ignitionproof
Raintight
Wet Locations
Watertight

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‡, 4X††, 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

‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.
††With S752 or S753.

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

EBMS Magnetic Line Starters 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, 3R, 4‡, 4X††, 7BCD, 9EFG, 12	Watertight

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. # EBMSFA**	**S787 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 — 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, 3R, 4‡, 4X††, 7BCD, 9EFG, 12 — Watertight

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 Polyphase	Volts	NEMA Size	Without Starter Cat. #	With Starter 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.

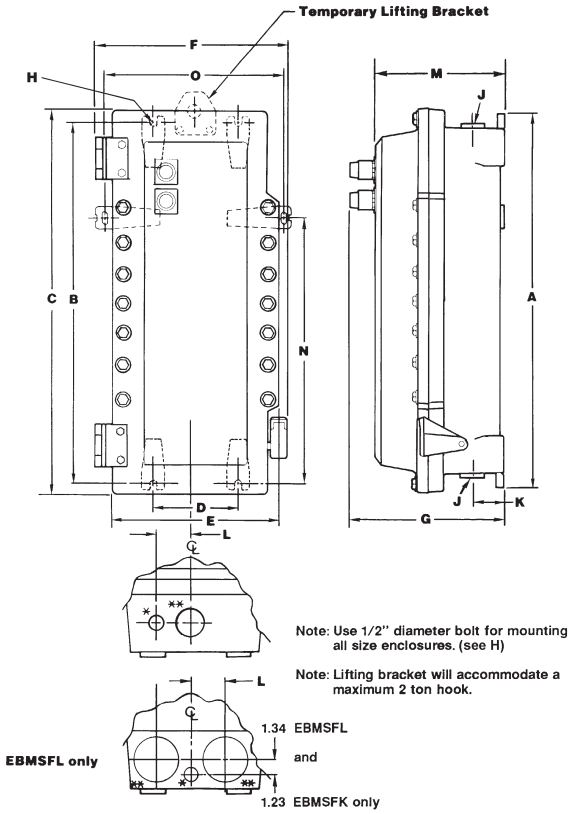
①Motor starters:

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	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, 3R, 4‡, 4X††, 7BCD, 9EFG, 12	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■	J** Conduit Entry Trade Size w/RE	K	L	M	N	O
Size 0,1 FVNR Starter§															
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	—	—
Size 2 FVNR Starter															
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	—	—
Size 3,4 FVNR Starter															
EBMSFD†	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	—	—
Size 5 FVNR Starter															
EBMSFK†	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.)
†For Cutler-Hammer W200 Advantage® starters.
■Drilled & Tapped.
‡ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.
††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

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:

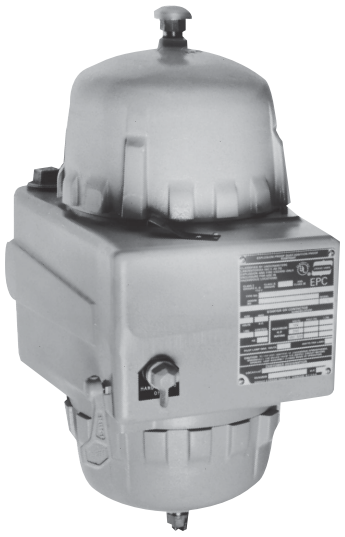
- Bodies and covers – copper-free aluminum
- Reset handle – copper-free aluminum
- Reset shaft – stainless steel
- Interior parts – stainless steel

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	Suffix
Control circuit transformer 600/480/240–120 volts, 50 or 60 hertz	
(Sizes 0 and 1 – 50VA, 100VA) Fusible – Secondary	FT
Primary and secondary	FTPS
Automatic reset overload relay	S1
Less overload relays (lighting contactor)	CL
Less overload relays (motor contactor)	CM
Auxiliary Contacts:*	
1NO/1NC	S781
2NO/2NC	S782
3NO/3NC	S783
Pilot light holes drilled, tapped and plugged for future addition of pilot lights –	
one hole	S541
two holes	S542
Side bosses drilled and tapped same size as standard hubs	S366
Back boss drilled and tapped same size as standard hubs	S367
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‡
Pushbuttons (heavy duty):	
START-STOP	PB3‡
Selector switches (standard duty):	
ON-OFF	RR2‡
HAND-OFF-AUTO	RR3‡
Pilot lights:	
Red, 120 volt	J1
Green, 120 volt	J3
Pilot light transformers:	
240 volt†	T2
480 volt†	T4
600 volt†	T5
Space heaters:	
120 volt	R11
240 volt	R22
480 volt	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.

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.

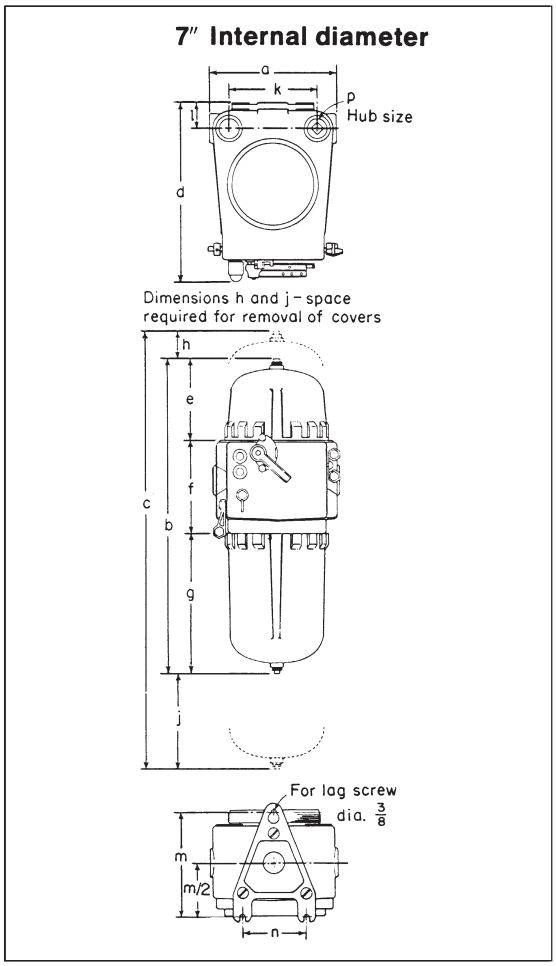
Motor Starter			Enclosure			
Max. HP Polyphase	Volts	NEMA/EEMAC Size	Hub Size in.	Int. Dia. in.	Without Starter Cat. #	With Starter Cat. # §
2	120	0	1¼	7	**EPC97**	**EPC970 ①613**
3	120	1	1¼	7	**EPC97**	**EPC971 ①613**
3	240	0	1¼	7	**EPC97**	**EPC970 ①623**
5	480	0	1¼	7	**EPC97**	**EPC970 ①643**
5	600	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 EPC97-FTPS
Int. Dia.	7"	7"
	Dimensions	Dimensions†
a	10⅝	10⅝
b	19 13/16	24 13/16
c	25 13/16	37 13/16
d	14 11/16	14 11/16
e	6¾	11¾
f	7 11/16	7 11/16
g	5⅜	5⅜
h	2	9
j	4	4
k	7⅜	7⅜
l	2 1/16	2 1/16
m	9⅜	9⅜
n	5¼	5¼
p	1¼	1¼

*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

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	**EPC PB3 KIT**
Replacement pushbutton station only for EPC-PB3-KIT	**16320 N**
ON-OFF selector switch assembly (2 position)	**EPC RR2 KIT**
Replacement switch only for EPC-RR2-KIT	**ESWP126**
HAND-OFF-AUTO selector switch assembly (3 position)	**EPC RR3 KIT**
Replacement switch only for EPC-RR3-KIT	**ESWP126**

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	**EMP015 ① KIT**
Pilot light assemblies with transformer and transformer mounting strap (for single pilot light) suffix S541	7" EPC only	**EPC87 ① ② KIT**
	11" EPC only	**EPC813 ① ② KIT**
2 pilot light assemblies with 2 transformers and transformer mounting strap (for double pilot light) suffix S542	7" EPC only	**EPC87 ① ① ② KIT**
	11" EPC only	**EPC813 ① ① ② KIT**
Replacement pilot light transformer only (240V primary)	All units	**15129 A**
Replacement pilot light transformer only (480V primary)	All units	**15130 A**
Replacement pilot light transformer only (600V primary)	All units	**15131 A**

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 accomodates field retrofit

Certifications and Compliances:

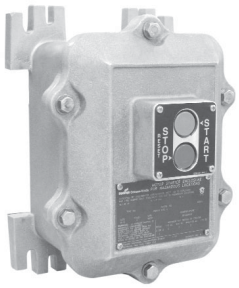
- Class I, Division 1 & 2, Groups C, D
- Class II, Division 1 & 2, Groups E, F, G
- Class III
- NEMA 3, 4, 4X*, 7(CD), 9(EFG)
- UL Standard: 1203
- cUL Standard: C22.2 No. 30

Standard Materials:

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

Electrical Ratings:

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



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

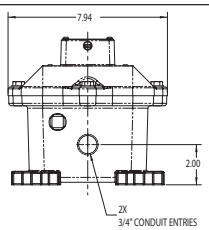
STARTER
D31 D = Square D and G = GE, followed by number of poles and NEMA size

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	

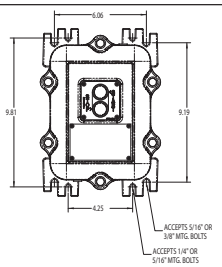
OPTIONS
S752 Gray Epoxy Powder Coating, outside only
S753 Gray Epoxy Powder Coating, outside and inside
S198V Breather (ECD-N4B) and Drain (ECD-N4D)
NTE No Top Entries

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

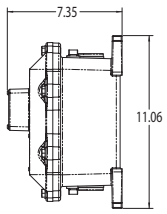
Dimensions
In Inches:



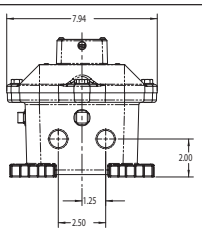
Top/Bottom View



Cover View



Side View



Bottom View
No Top Entry Option

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

Crouse-Hinds by EATON

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

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 accomodates 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

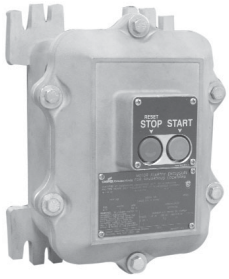
Standard Materials:

- 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:



Catalog Numbering System:

SERIES	ENCLOSURE TYPE	STARTER	OPTIONS
EMN	26	WP16	S198V

SERIES
EMN — Explosionproof Compact Manual Motor Starter

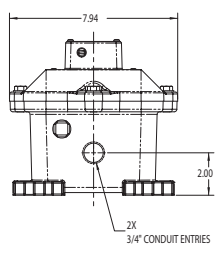
ENCLOSURE TYPE
26 — Compact Pushbutton Enclosure pre-drilled for Cutler-Hammer™ Starter

STARTER
WP16 — W = Cutler-Hammer™ followed by starter type suffix
- WP16 = IEC, .16A
- W1P6 = IEC, 1.6A
- W012 = IEC, 12A

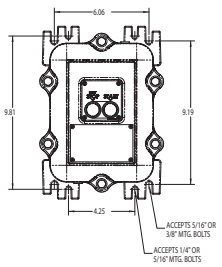
MAXIMUM HORSEPOWER						ADJUSTMENT RANGE FLA	RATED UNINTERRUPTED CURRENT	CATALOG NUMBER
Single Phase		Three Phase						
115V	230V	200-208V	230V	480V	600V			
-	-	*	*	*	*	0.1-0.16	0.16	EMN26 WP16
-	-	*	*	*	*	0.16-0.25	0.25	EMN26 WP25
-	-	*	*	*	*	0.25-0.4	0.4	EMN26 WP40
-	-	*	*	*	*	0.4-0.63	0.63	EMN26 WP63
-	-	*	*	0.5	0.5	0.63-1	1	EMN26 W001
-	0.1	*	*	0.75	0.75	1-1.6	1.6	EMN26 W1P6
-	0.16	0.5	0.5	1	1.5	1.6-2.5	2.5	EMN26 W2P5
0.12	0.33	0.75	0.75	2	3	2.5-4	4	EMN26 W004
0.25	0.5	1	1	3	5	4-6.3	6.3	EMN26 W6P3
0.5	1.5	2	3	5	7.5	6.3-10	10	EMN26 W010
0.5	2	3	3	7.5	10	8-12	12	EMN26 W012
1	2	3	5	10	10	10-16	16	EMN26 W016
1.5	3	5	5	10	15	16-20	20	EMN26 W020
2	3	5	7.5	15	20	20-25	25	EMN26 W025

*In this range, calculate motor rating according to rated current. Specified values to NEC Table 430.250.

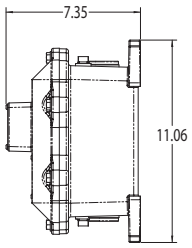
OPTIONS
S752 — Gray Epoxy Powder Coating, outside only
S753 — Gray Epoxy Powder Coating, outside and inside
S198V — Breather (ECD1-N4B) and Drain (ECD1-N4D)
NTE — No Top Entries



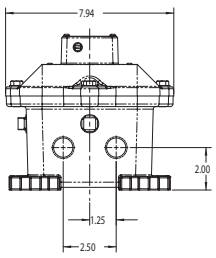
Top/Bottom View



Cover View



Side View



Bottom View
No Top Entry Option

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

Crouse-Hinds by EATON

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

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.

Motor Starter

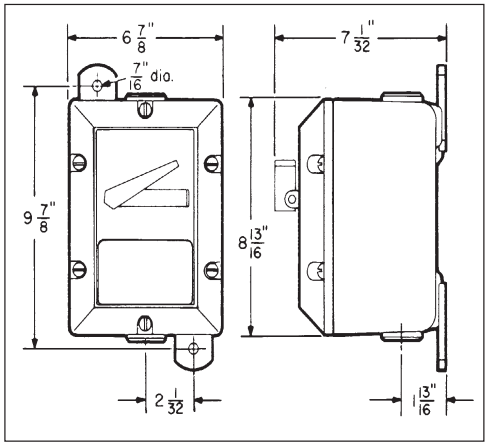
NEMA Size	Poles (Phase)	Max. AC HP Ratings 115V	208/240V	480/600V	Enclosure With Starter Cat. #
M-0	2 (1PH)	1	2		**EMN24 W20**
M-1	2 (1PH)	2	3		**EMN24 W21**
M-1P	2 (1PH)	3	5		**EMN24 W21P**
M-0	3 (3PH)	2	3	5	**EMN24 W30**
	3 (1PH)	2	3		
M-1	3 (3PH)	3	7½	10	**EMN24 W31**

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.

GUSC Enclosures

with Manual Motor Starters

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 ¼" 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 Compliances:

- 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:

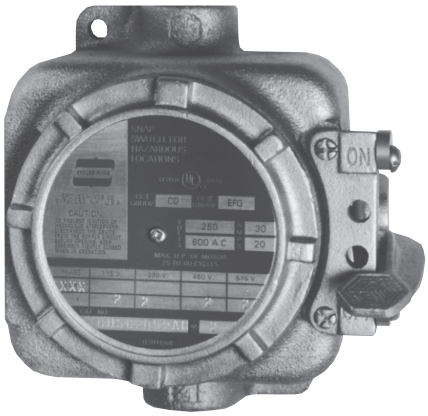
- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Stainless steel – natural

Size Ranges:

- Hub size – ¾" (through feed arrangement)

Electrical Rating Ranges:

- See below



Ordering Information:

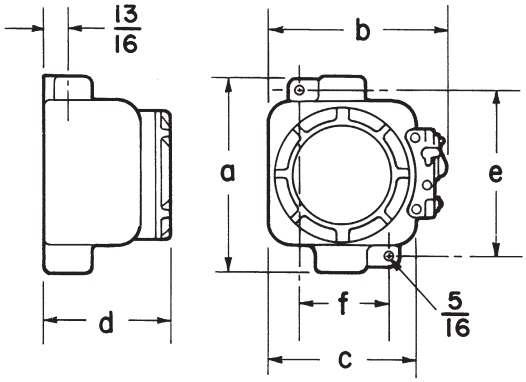
Cat. #	Style	Rating/Horsepower 120VAC / 3 HP	240VAC / 7½ HP	480VAC / 15 HP	600VAC / 15 HP	Hub Size
GUSC2013-MS*	3-Pole	30A	30A	30A	20A	¾"

Cat. #	Style	Rating/Horsepower 120VAC / 3 HP	240VAC / 7½ HP	480VAC / 15 HP	600VAC / 20 HP	Hub Size
GUSC2036-MS	3-Pole	40A	40A	40A	40A	¾"

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

Dimensions
In Inches:

Fig. 1



Dimensions are approximate, not for construction purposes.

Type	Size	a	b	c	d	e	f
Through Feed Hubs – Fig. 1							
	3-Pole	6 3/16	6 1/16	4 7/8	4 1/8	5 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

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 ¾" 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:

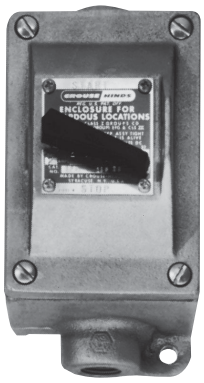
- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Type 6 / 6 nylon – natural (black)
- Stainless steel – natural

Options:

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

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

EFD dead end



EFDC through feed

Electrical Ratings

Without Overload Protection With Switches

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

Ordering Information

Dead end

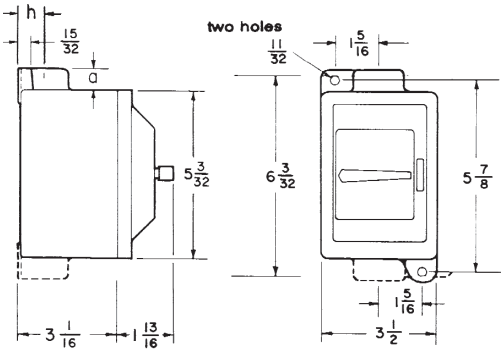
Poles	Hub Size in.	With Switch Cat. #
2	¾	**EFD218 T8**
	1	**EFD318 T8**
3	¾	**EFD2419**
	1	**EFD3419**

Through feed

Poles	Hub Size in.	With Switch Cat. #
2	¾	**EFDC218 T8**
	1	**EFDC318 T8**
3	¾	**EFDC2419**
	1	**EFDC3419**

Dimensions

In Inches:



Dimensions are approximate, not for construction purposes

Hub Size	Dim. "h"	Dim."a"
¾	⅞	13/16
1	1	15/16

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

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:

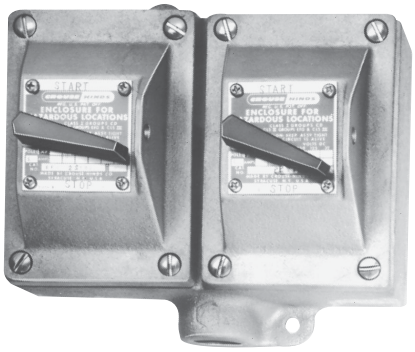
Factory sealed devices have many distinct advantages:

- 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 journalled shafts and bearings produce flametightness of enclosure joints
- Dead end (EDS) or through feed (EDSC) hubs – 3/4" or 1" sizes

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/EEMAC: 3, 7B*CD, 9EFG
- UL Standard: 1203
- CSA Standard: C22.2 No. 30

EDSC2199



EDS2299

Standard Materials:

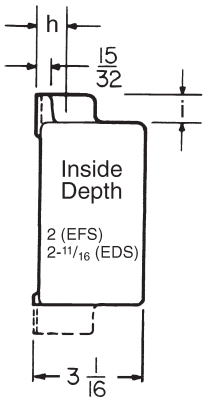
- Bodies – *Feraloy*® iron alloy (U.S.); copper-free aluminum (Canada)
- Shafts & bushings – stainless steel
- Sealing enclosures – copper-free aluminum

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



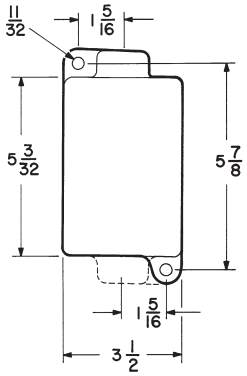
Options:

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

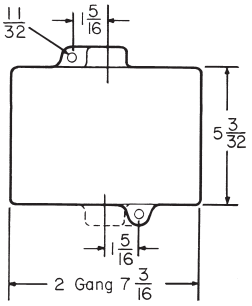
Hub Size	Dim. "h"	Dim. "i"
3/4	7/8	13/16
1	1	15/16

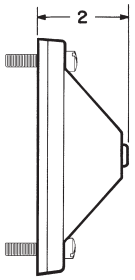
Front View

Single gang



Two gang





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

Dimensions are approximate, not for construction purposes.

*Seals must be installed within 1½" of each conduit opening in Division 1.

Crouse-Hinds by EATON

Ordering Information

With Allen-Bradley Bulletin 600 Switches

Poles	Maximum HP Ratings 115–230 Volts AC	115–230 Volts DC	Cat. #
1	1 hp		**A B BUL 600 TOX4**
2	1 hp	¾ hp	**A B BUL 600 TOX5**

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

With General Electric Switches

Poles	Maximum HP Ratings 115–230 Volts AC	115 Volts DC	230 Volts DC	Cat. #
1	1 hp	1 hp	¼ hp	**GE CR101 Y**
2	1 hp	1 hp	1 hp	**GE CR101 H**

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

Heater Table (Allen-Bradley)

Max. Motor Full-Load Amps	Eaton's Crouse-Hinds Symbol Number	Max. Motor Full-Load Amps	Eaton's Crouse-Hinds 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 Full-Load Amps	Eaton's Crouse-Hinds Symbol Number	Max. Motor Full-Load Amps	Eaton's Crouse-Hinds 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.

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 Volts AC	32 Volts DC	120 Volts DC	240 Volts DC	Cat. #
1	1 hp	¼ hp	¼ hp	¼ hp	**WEST MST01**
2	1 hp	¼ hp	1 hp	¾ hp	**WEST MST02**

Poles	Hub Size in.	Dead end Cat. #	Through feed Cat. #
Single Gang			
1	¾	**EDS21101** ①	**EDSC21101** ①
	1	**EDS31101** ①	**EDSC31101** ①
2	¾	**EDS21102** ①	**EDSC21102** ①
	1	**EDS31102** ①	**EDSC31102** ①
Two Gang			
1	¾	**EDS22101** ①	**EDSC22101** ①
	1	**EDS32101** ①	**EDSC32101** ①
2	¾	**EDS22102** ①	**EDSC22102** ①
	1	**EDS32102** ①	**EDSC32102** 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_2, 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

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 Compliances:

- UL/cUL Listed
- Class I, Division 2, Groups A, B, C, D
- Class I, Zones 1 and 2, Ex de IIB+H_2, 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	(A)Ex ed IIC T5, T6
Rated Voltage	Up to 690 VAC
Rated Current	Up to 25 A
Rated Current, Aux. Contact	2 A
Short Circuit	See table on next page
Under Voltage Trip	Tripping at 15% – 75% V-rated Switching - on when V> 80% V-rated
Connection Terminals	Up to 10mm^2
Connection Terminals, Aux. Contact	2 x 2.5 mm^2
Conduit or Cable Entries	2 x ¾" Myers hubs
Weight	5.5 lbs./2.5 Kg.

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_2, 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

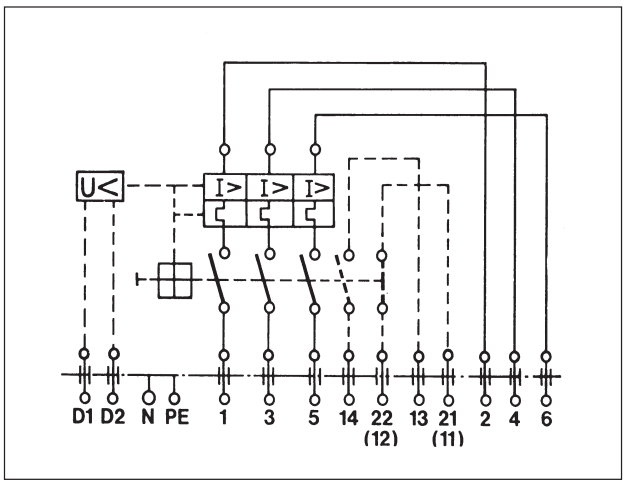
Setting Range or rated current	Cat. #
0.1 – 0.16 A	**GHG 635 1101 L0101**
0.16 – 0.25 A	**GHG 635 1101 L0102**
0.25 – 0.40 A	**GHG 635 1101 L0103**
0.40 – 0.63 A	**GHG 635 1101 L0104**
0.63 – 1.0 A	**GHG 635 1101 L0105**
1.0 – 1.6 A	**GHG 635 1101 L0106**
1.6 – 2.5 A	**GHG 635 1101 L0107**
2.5 – 4.0 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 Options†

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

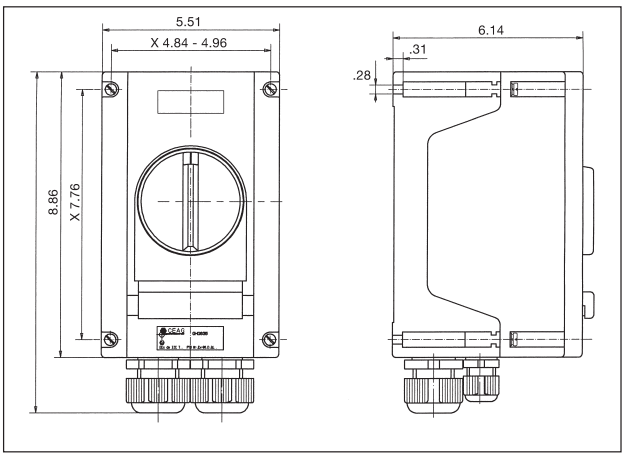
†Catalog numbers on this page are shown without auxiliary contacts. To add aux. contacts, change last number in "1101" to a 2 or 3. Ex. 1102.

Wiring Diagram



Dimensions

In Inches:



Crouse-Hinds by EATON

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 – ½" and ¾" 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

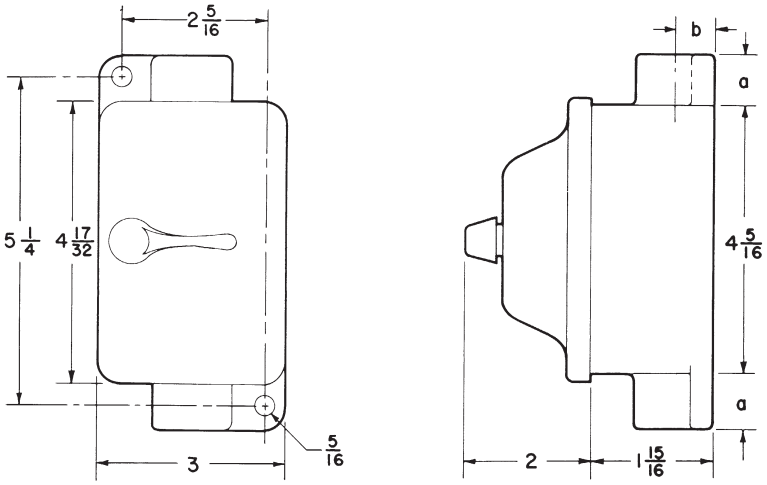
Standard Finishes:

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

MC dead end

MCC through feed

Dimensions
In Inches*:



*Dimensions are approximate, not for construction purposes.

Hub Size	½	¾
a	⅞	⅞
b	⅝	¾

MC Series Manual Motor Starting Switches and Enclosures

NEMA 3, 4, 12
Raintight
Wet Locations

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 Cat. #	Without Switch 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 Cat. #	Without Switch 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

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, ½" or ¾" 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

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

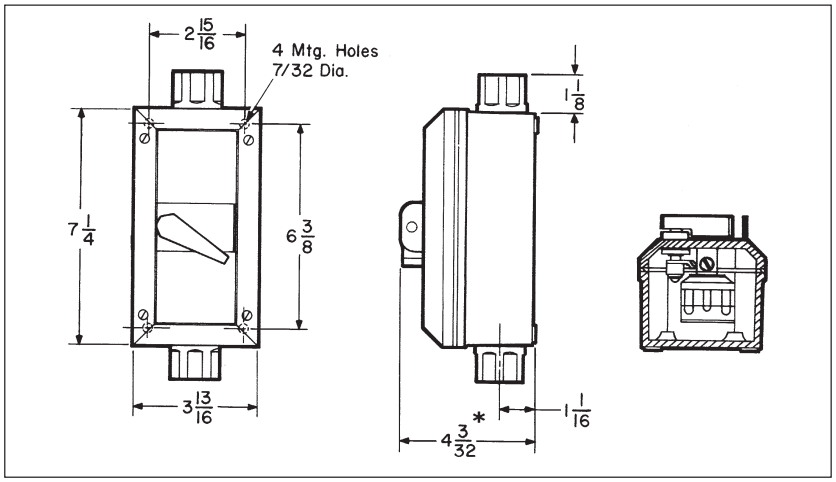
	Enclosure With Switch	
Poles	**Hub Size**	**Through Feed Cat. #**
2	½	**NSSC D12**
	¾	**NSSC D22**
3	½	**NSSC D13**
	¾	**NSSC D23**

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 Volts AC	115–230 Volts DC
1	1 hp	
2	1 hp	¾ hp

Poles	Enclosure With Starter: Hub Size	Through Feed Cat. #
1	½	NFSC AB11 ①
	¾	NFSC AB21 ①
2	½	NFSC AB12 ①
	¾	NFSC AB22 ①

Heater Table (see pages 479–480)

With Cutler-Hammer Switches

Maximum HP Ratings

Poles	115–230 Volts AC	115–230 Volts DC
1	1 hp	
2	1 hp	1 hp

Poles	Enclosure With Starter: Hub Size	Through Feed Cat. #
1	½	NFSC C11 ①
	¾	NFSC C21 ①
2	½	NFSC C12 ①
	¾	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 VAC	32 VDC	115 VDC	230 VDC
1	1 hp	¼ hp	1 hp	¼ hp
2	1 hp	¼ hp	1 hp	1 hp

Poles	Enclosure With Starter: Hub Size	Through Feed Cat. #
1	½	NFSC G11 ①
	¾	NFSC G21 ①
2	½	NFSC G12 ①
	¾	NFSC G22 ①

Heater Table (see pages 479–480)

With Square D Switches

Maximum HP Ratings

Poles	115–230 Volts AC	115–230 Volts DC
1	1 hp	
2	1 hp	¾ hp

Poles	Enclosure With Starter: Hub Size	Through Feed Cat. #
1	½	NFSC D11 ①
	¾	NFSC D21 ①
2	½	NFSC D12 ①
	¾	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

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, ¾" 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

Ordering Information

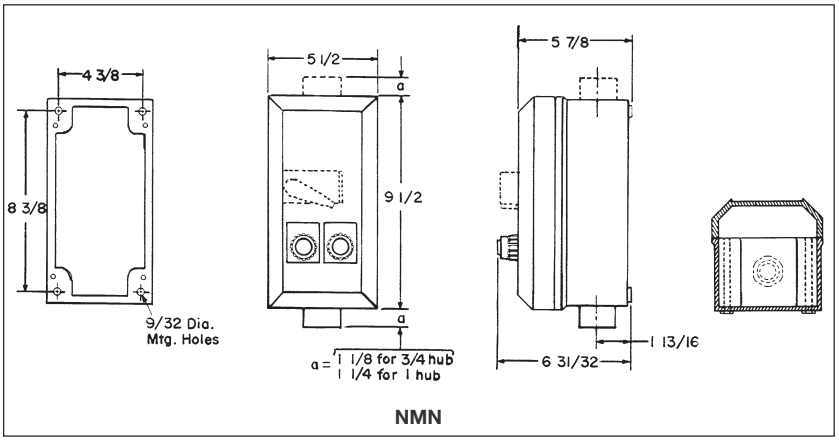
Starter					Enclosure with Starter ¾" Hubs		1" Hubs	
NEMA Size	Poles	Max. HP 115V	230V	460/575V	Dead End Cat #	Through Feed Cat #	Dead End Cat #	Through Feed Cat #
M-0	2 (1 PH)	1	2		NMN ①220	NMNC ①220	NMN ①320	NMNC ①320
M-1	2 (1 PH)	2	3		NMN ①221	NMNC ①221	NMN ①321	NMNC ①321
M-1P	2 (1 PH)	3	5		NMN ①221P	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					
	3 (3 PH)	3	7½	10	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:



NMN

*Furnished with mounting plate and operator installed.

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:

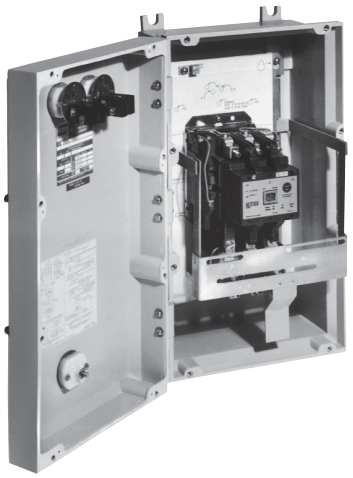
- Enclosures are made of Eaton's Crouse-Hinds high-impact strength *Krydon*® fiberglass-reinforced polyester material which has excellent corrosion resistance and stability to heat.
- Unitized, strong and durable enclosure construction provides longer service life for equipment.
- Exterior parts of RESET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

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**

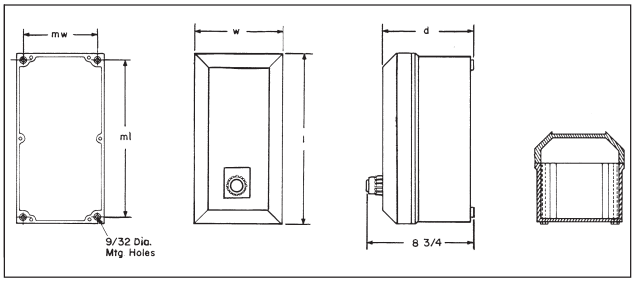
Example: A NEMA size 4, 480 V Westinghouse starter with START-STOP pushbuttons would be Cat. No. NMG1426-W6434-PB13.

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").

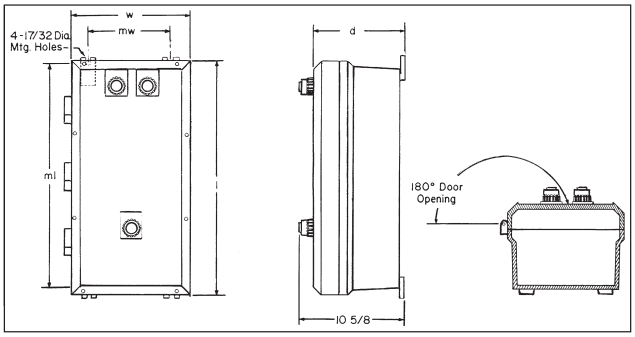
Starter Size	Number Included	Hub Size
0	3	¾
1	1	¾
	2	1
2	1	¾
	2	1½
3	1	¾
	2	2
4	1	¾
	2	2½

Dimensions†

In Inches:



NMG0710 & 0714



NMG1018 & 1024

Enclosure Cat. #	Outside Dimensions l	w	d	Mounting Dimensions ml	mw
NMG0710	10½	7½	7	9⅜	6⅜
NMG0714	14½	7½	7	13⅜	6⅜
NMG1018	19 13/32	11 13/32	8 23/32	19⅜	7⅞
NMG1024	25 13/32	11 13/32	8 23/32	25⅜	7⅞

†Not to be used for construction purposes unless approved.

2C

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 Cl. II, Div. 1, Groups E, F, G Cl. II, Div. 2, Groups F, G 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 Cl. II, Div. 1, Groups E, F, G Cl. II, Div. 2, Groups F, G Cl. III	3R, 4, 7BCD, 9EFG, 12	Thermal-Magnetic	15–800	120AC to 600AC 125DC to 250DC	G.E. – TEB, TED, TFJ, TFK, TJJ, TJK, TKMA Sq. D – FAL, KAL, LAL, MAL 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 Cl. II, Div, 1, Groups E, F, G Cl. II, Div. 2, Groups F, G Cl. III	3, 4, 7CD, 9EFG	Thermal-Magnetic	15–150	120AC to 600AC 125DC to 250DC	G.E. – TEB, TED, TFJ Sq. D – FAL, KAL Cut.-Ham. – EHD, FD, FDB, JD, JDB	1, 2, 3	Yes	Threaded
FLB	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	3, 7CD, 9EFG	Thermal-Magnetic	15–225	120AC to 600AC 125DC to 250DC	G.E. – TEB, TED, TFJ, TFK Sq. D – FAL, KAL Cut.-Ham. – EHD, FD, FDB, JD, JDB	1, 2, 3	Yes	Threaded
EIB	Cl. I, Div. 1 & 2, Groups B, C, D Cl. I, Zones 1 & 2 Cl. II, Div. 1, Groups E, F, G 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 250DC	G.E. – TEB, TED, TFJ Sq. D – FAL, KAL, LAL 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

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 (hosetight) 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 – Electrogalvanized

Options:

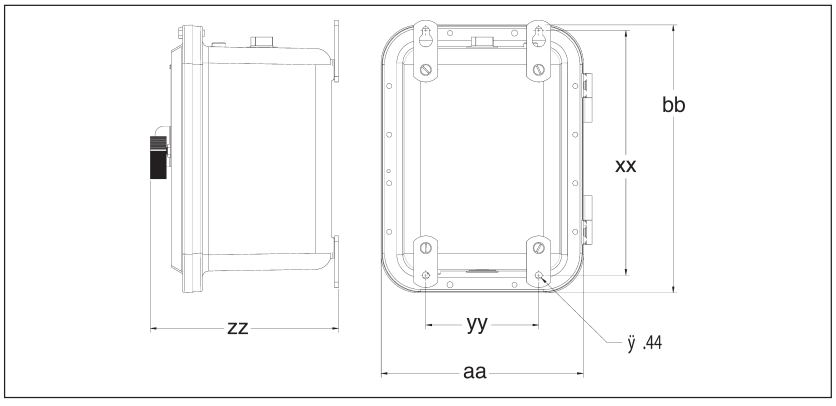
Description	Suffix
Insulated Neutral Lug	**S146**
Grounded Neutral Lug Kit with Connectors for 50, 100 & 225 Amps	**S178**
External Ground Stud	**S214**
Breather and Drain	**S756V**
Epoxy Powder Coat Finish (exterior only)	**S752**
Epoxy Powder Coat Finish (exterior and interior)	**S753**

Ordering Information

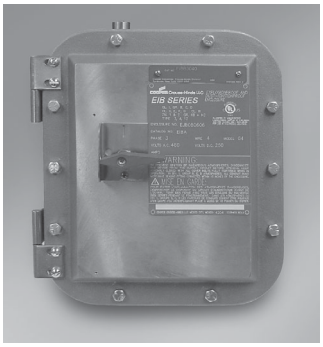
Circuit Breaker Rating (amps)	Enclosure Only	Enclosure with Circuit Breaker
15	EIBA	**EIBA3015**
20	EIBA	**EIBA3020**
25	EIBA	**EIBA3025**
30	EIBA	**EIBA3030**
35	EIBA	**EIBA3035**
40	EIBB	**EIBB3040**
45	EIBB	**EIBB3045**
50	EIBB	**EIBB3050**
60	EIBB	**EIBB3060**
70	EIBB	**EIBB3070**
80	EIBB	**EIBB3080**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

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"



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.

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‡, 4X††, 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‡, 4X††, 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‡, 4X††, 7BCD, 9EFG, 12

Explosionproof
Dust-Ignitionproof
Raintight
Wet Locations
Watertight

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†**
• Pilot light, 120VAC, green jewel, w/blank indicating plate	①	**J3 †**
• LED pilot lights in place of standard incandescent pilot lamps	①	**LED**
• Start-stop pushbuttons (requires 2 spaces)	①	**PB23 †‡**
• 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 ‡**
• Std. breather & drain, Class I, B, C & D; Class II, E, F & G; Class III	①	**S756V ‡**
• 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.

*1000 Ampere Frame (max. 800 ampere trip.)
†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.
‡Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.
††With S752 or S753.

3C EBMB Series Circuit Breakers 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, 3R, 4‡, 4X††, 7BCD, 9EFG, 12 — 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✠	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 TT②TEB32**
3	240VAC or 125–250VDC	150 Amp. Frame	**EBMBA**	† §	10A through 70A	**EBMBA TT②TEB32**
3	480VAC or 250VDC	100 Amp. Frame	**EBMBA**	*	15A through 70A	**EBMBA ①②③34**
3	480VAC or 250VDC	150 Amp. Frame	**EBMBA**	† §	10A through 70A	**EBMBA TT②TED34**
3	600VAC	150 Amp. Frame	**EBMBA**	† § ■	10A through 70A	**EBMBA ①②③36**
3	240VAC or 125–250VDC	100 Amp. Frame	**EBMBB**	*	15A through 100A	**EBMBB TT②TEB32**
3	240VAC or 125–250VDC	150 Amp. Frame	**EBMBB**	† §	10A through 150A	**EBMBB TT②TEB32**
3	480VAC or 250VDC	100 Amp. Frame	**EBMBB**	*	15A through 100A	**EBMBB ①②③34**
3	480VAC or 250VDC	150 Amp. Frame	**EBMBB**	† §	10A through 150A	**EBMBB TT②TED34**
3	600VAC	150 Amp. Frame	**EBMBB**	† § ■	15A through 150A	**EBMBB ①②③36**
3	600VAC	250 Amp. Frame	**EBMBG**	✪ ▲	70A through 250A	**EBMBG ①②③36**
3	600VAC or 250VDC	400 Amp. Frame	**EBMBK**	▼	100A through 400A	**EBMBK ①②③36**
3	600VAC or 250VDC	600 Amp. Frame	**EBMBL**	♠	250A through 600A	**EBMBL WT②③36**
3	600VAC or 250VDC	800 Amp. Frame	**EBMBL**	♥	300A through 800A	**EBMBL WT②③36**

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)†§■ – 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)✪▲ – 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

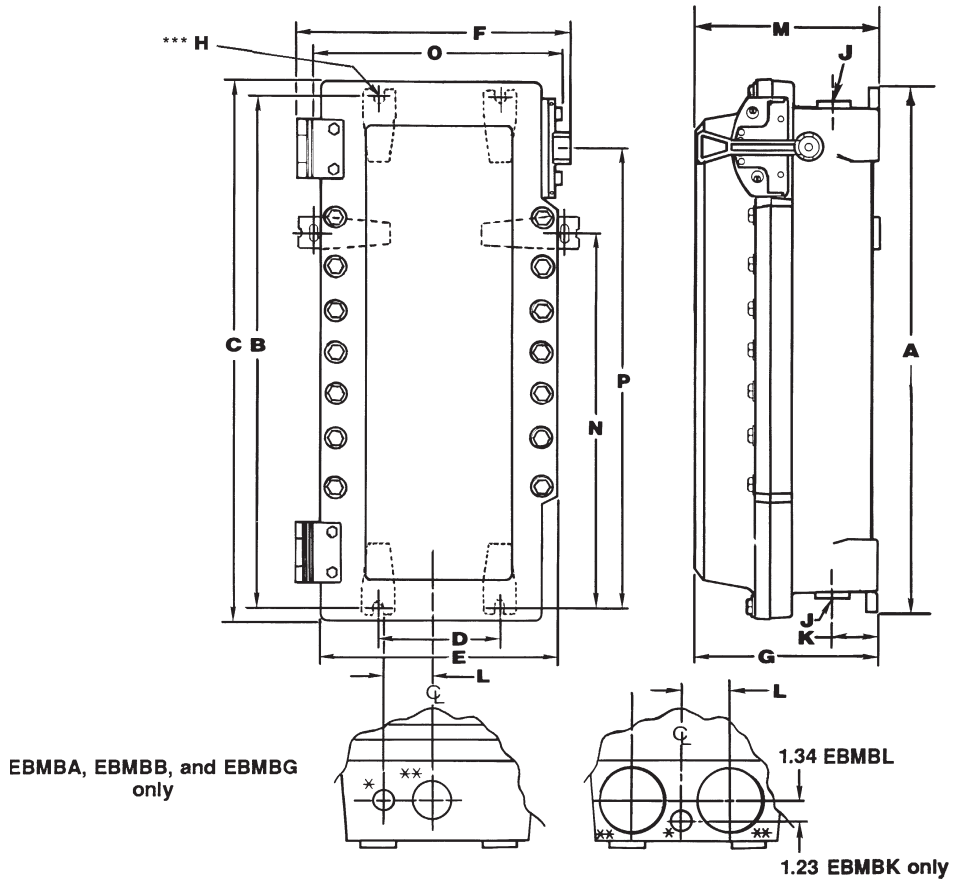
③Select Circuit Breaker Frame Type based on frame size, voltage, and manufacturer desired:

	100 Amp. Frame			150 Amp. Frame			250 Amp.	400 Amp.	600 Amp.	800 Amp.
Manufacturer	240VAC	480VAC	600VAC	240VAC	480VAC	600VAC	Frame✪▲ 600VAC	Frame 600VAC	Frame 600VAC	Frame 600VAC
Cutler-Hammer	—	EHD	—	—	—	FDB	JD✡ JDB✣	KD✡ KDB✣	LD	MD
General Electric	TEB	—	—	—	TED	TED	TFK✡ TFJ✣	TJK✡ TJJ✣	TJK	TKMA

✡–Interchangeable Trip Unit
✣–Non-Interchangeable Trip Unit

‡ Enclosure not suitable for NEMA 4 or 4X with cover mounted operators.
††With S752 or S753.
✠ 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.
† 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.
✪ General Electric TFJ and TFK types are 225 amp. frame, available 70 though 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.

Dimensions
In Inches:



Dimensions are approximate, not for construction purposes.

* 1" Drilled & Tapped (D & T) conduit entry for control conductors supplied with PLG plug top and bottom.
** Conduit entrance(s) for power conductors (top and bottom). (All conduit entrance(s) supplied with RE reducer and PLG plug.)
*** Use ½" diameter bolts for mounting all enclosures. (see H) Note: Lifting bracket will accommodate a maximum 2 ton hook.

Enclosure Only Cat. #	Enclosure Size Symbol	Dimensions A	B	C	D	E	F	G	J** Conduit Entry Trade Size D&T§	w/RE	Dimensions 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.

3C EPC Series Circuit Breakers and Enclosures

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:

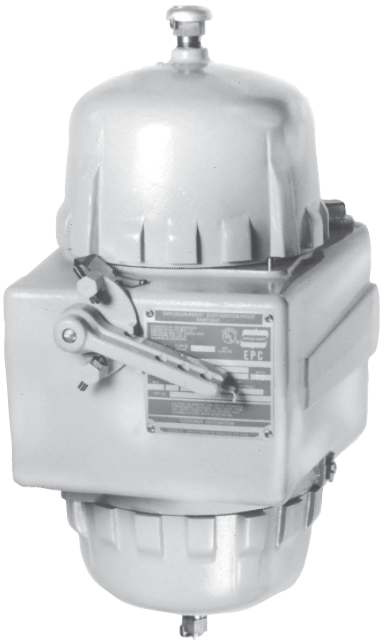
- NEC/CEC
  - Class I, Division 1 & 2, Groups C, D
  - Class II, Division 1, Groups E, F, G
  - Class II, Division 2, Groups F, G
  - Class III
- NEMA: 3, 4, 7CD, 9EFG
- UL Standard: 698
- CSA: C22.2 No. 30

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§**

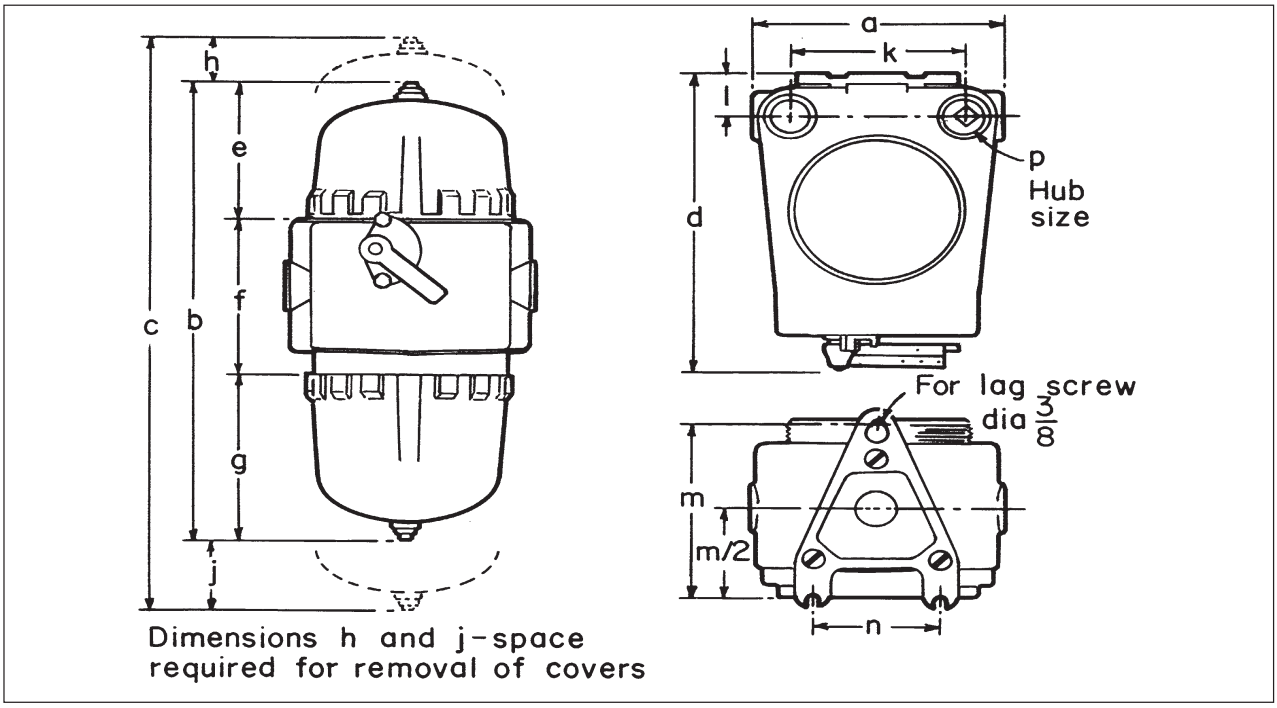
Electrical Rating Ranges:

- 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.

Dimensions
In Inches*



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

*Dimensions are approximate, not for construction purposes.

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				
Poles	Voltage Rating	Int. Dia.	Hub Size	Circuit Bkr. Amp Rating	Without Circuit Bkr. Cat. #	With Circuit Bkr. Cat. #
2	240VAC or 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

Non-Interchangeable Trip

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

FLB 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

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:

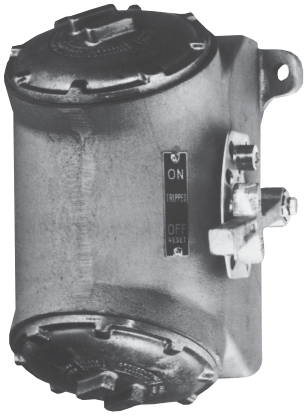
- Bodies, covers and operating handles – copper-free aluminum
- Operating shafts – stainless steel
- Interior parts – sheet steel

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



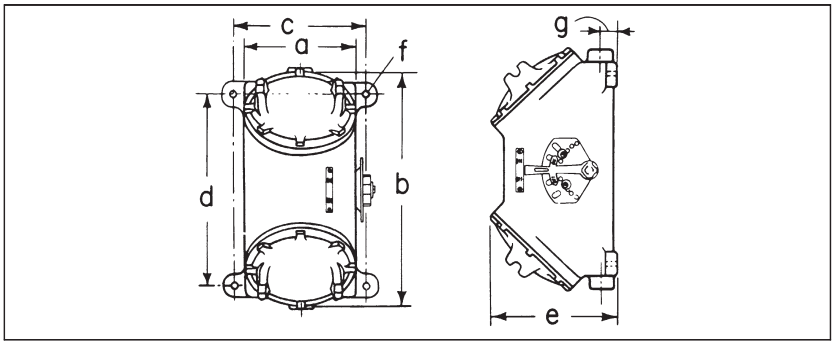
Options:

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.

Crouse-Hinds by EATON

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

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 or 125VDC	¾	15	FLB220	FLB220 TT15 1
			20		FLB220 TT20 1
			30		FLB220 TT30 1
			40		FLB220 TT40 1
			50		FLB220 TT50 1
2	240VAC or 125–250VDC	1	15	FLB221	FLB221 TT15 2
			20		FLB221 TT20 2
			30		FLB221 TT30 2
			40		FLB221 TT40 2
			50		FLB221 TT50 2
		1½	70	FLB223	FLB223 TT70 2
			90		FLB223 TT90 2
			100		FLB223 TT100 2
3	240VAC	1¼	15	FLB222	FLB222 TT15 3
			20		FLB222 TT20 3
			30		FLB222 TT30 3
			40		FLB222 TT40 3
			50		FLB222 TT50 3
		1½	70	FLB223	FLB223 TT70 3
			90		FLB223 TT90 3
			100		FLB223 TT100 3

FLB Series Circuit Breakers and Enclosures

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

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

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
		1 1/2	70	FLB142	FLB142 WT70 2	FLB142 TT70 2
			90		FLB142 WT90 2	FLB142 TT90 2
			100		FLB142 WT100 2	FLB142 TT100 2
3	480VAC	1 1/4	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
		1 1/2	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

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

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

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 flametight joint
- Dead-end (EFD) or through feed (EFDC) hubs ¾" 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

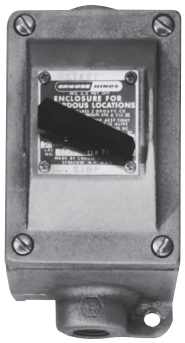
Standard Materials:

- 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

EFD dead end



EFDC through feed

Electrical Ratings:

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

Options:

Description	Suffix
For use in Group B hazardous areas*	GB

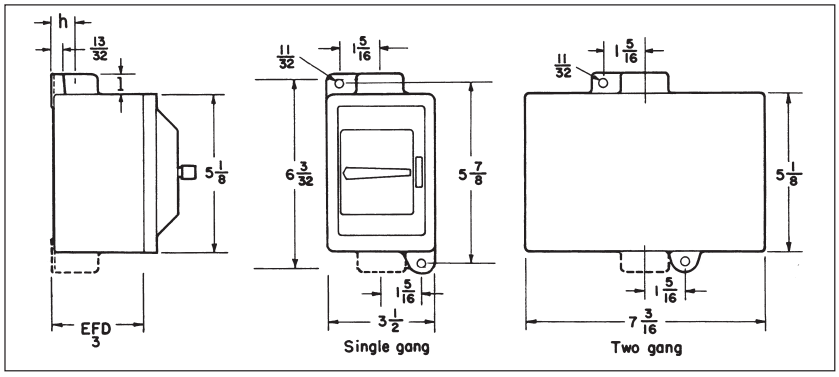
Ordering Information

With Square D Type "QOU" Circuit Breakers

Hub Size in.	15 Amp Cat. #	20 Amp Cat. #	30 Amp Cat. #
EFD Single Gang (Dead End)			
¾	EFD21104	EFD21105	EFD21106
1	EFD31104	EFD31105	EFD31106
EFDC Single Gang (Through Feed)			
¾	EFDC21104	EFDC21105	EFDC21106
1	EFDC31104	EFDC31105	EFDC31106
EFD Two Gang (Dead End)			
¾	EFD22104	EFD22105	EFD22106
1	EFD32104	EFD32105	EFD32106
EFDC Two Gang (Through Feed)			
¾	EFDC22104	EFDC22105	EFDC22106
1	EFDC32104	EFDC32105	EFDC32106

Dimensions

In Inches†:



Hub Size	Dim. "h"	Dim. "l"
¾	⅞	13/16
1	1	15/16

*Seals must be installed within 1½" of each conduit opening, for Group B use.
†Dimensions are approximate, not for construction purposes.

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	Suffix
• Insulated, groundable type terminal block for grounded or ungrounded neutral can be supplied	S618
• Hubs (see "Note on Hubs") – see listing on page 677	
• Grounding plate or bushing – see listing on page 677	

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. #
100A Frame (Non-Interchangeable Trip)				
2	240 VAC/ 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/ 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				
		100/ 150A			225/ 250A	400A
Manufacturer	Symbol	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, EHD	FB, FDB	JB, 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 EATON

NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

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

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/ 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/ 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/ 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:

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

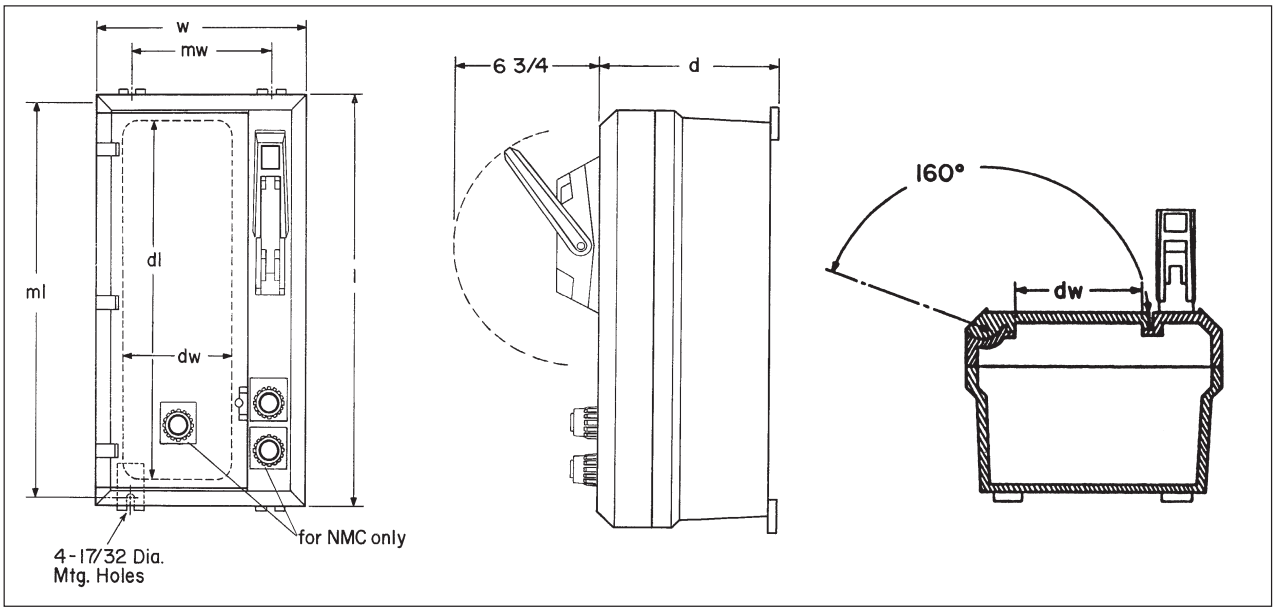
‡2-pole, 600 VAC/250 VDC for Square D circuit breakers only.
*For Square D circuit breakers only.
§Also available with interchangeable trip breakers. Specify on order.

NCB Series Circuit Breakers and Enclosures

600VAC, 250VDC Heavy Duty

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

Dimensions
In Inches*



	Outside Dimensions			Mounting Dimensions		Door Opening Dimensions	
Cat. #	**l**	**w**	**d**	**mw**	**ml**	**dl**	**dw**
NCB1018	19 13/32	11 13/32	8 23/32	7 7/8	19 3/8	16 7/8	5 11/16
NCB1024	25 13/32	11 13/32	8 23/32	7 7/8	25 3/8	22 7/8	5 11/16
NCB1426	27 13/32	15 13/32	9 23/32	11 7/8	27 1/4	23 11/16	9 11/16

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

Description

4C Control Stations

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 Pilot light Selector switch		1-5*	Surface 1-5 gang	Gasketed
EDS, EDSC§	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	3, 7B (Div. 2) CD, 9EFG	Pilot light Pushbutton Selector switch	Pilot light Pushbutton Selector switch§	1-2*	Surface 1-2 gang	Ground joint
DSD Covers 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	3, 7B, 9EFG	Pilot light Pushbutton Selector switch	Pilot light Pushbutton Selector switch	1	Surface 1 gang	Ground joint
DSD-SR	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	3, 5, 7CD, 9EFG, 12	Selector Switch		1	Surface 1 gang	Ground joint
EDSCM	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	3, 7CD, 9EFG	Pilot light Pushbutton Selector switch		1-15*	Surface 1-15 gang	Ground joint
EFS§	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	3, 7BCD, 9EFG	Pilot light Pushbutton Selector switch	Pilot light§ Pushbutton Selector switch	1-2*	Surface 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 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	3, 7B (Div. 2) CD, 9EFG	Pilot light Pushbutton	Pilot light Pushbutton	1-2-3	Surface 1-2 gang	Ground joint
GHG43	Cl. I, Div. 2, Groups A, B, C, D Cl. I, Zones 1 and 2, (A)Ex de IIB + H2, T6 Cl. II, Div. 1, Groups E, F, G PTB ATEX Certified 3117 CENELEC EEx de IIC, T6, Zones 1 and 2 Eex de IIC, T6 Zones 21 and 22	4X, IP66	Pushbutton Signal Lamp Potentiometer Ammeter Selector Switch Terminal Blocks		1-4*	Surface 1 gang	Screw and Gasket
N2FA, N2FAC	Cl. I, Div. 2, Groups B, C, D	3, 7BCD, 12	Fire Alarm	Pushbutton Selector switch	1	Surface 1 gang	Screw and Gasket
N2S, N2SC N2SU, N2SCU	Cl. I, Div. 2, Groups B, C, D	3, 4X, 7BCD, 12	Pilot light Pushbutton Selector switch Combination	Pilot light Pushbutton Selector switch Combination	1-4*	Surface 1 gang	Screw and Gasket
OAC	Cl. I, Div. 1, Groups A, B, C, D Cl. I, Div. 2, Groups A, B, C, D Cl. II, Div. 1, Groups E, F, G Cl. II, Div. 2, Groups F, G Cl. III	3, 7ABCD, 9EFG, 12	Pushbutton Selector switch	Pushbutton Selector switch	1-2*	Surface 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:

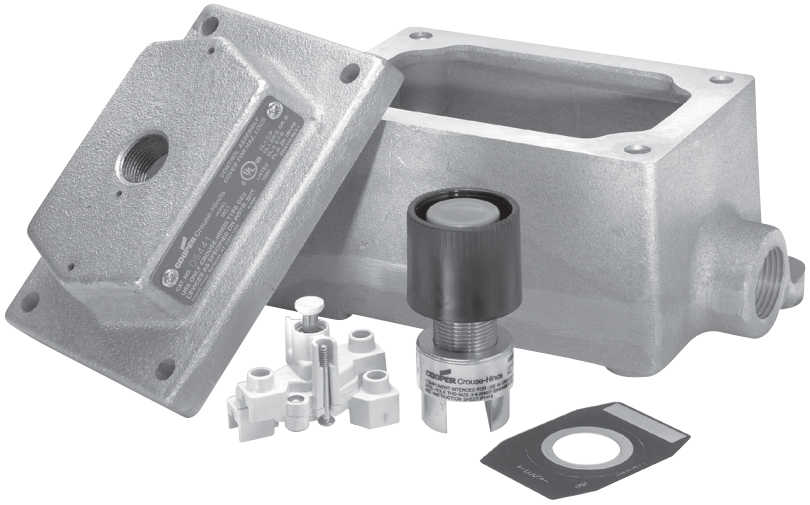
- For use indoors or outdoors, in areas which are hazardous due to the presence of flammable gases and vapors, or combustible dust.
- Used in conjunction with magnetic starters or contactors for remote control of motors and other electrical apparatus.
- For installation in petroleum refineries, chemical, 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 ½", ¾", 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.

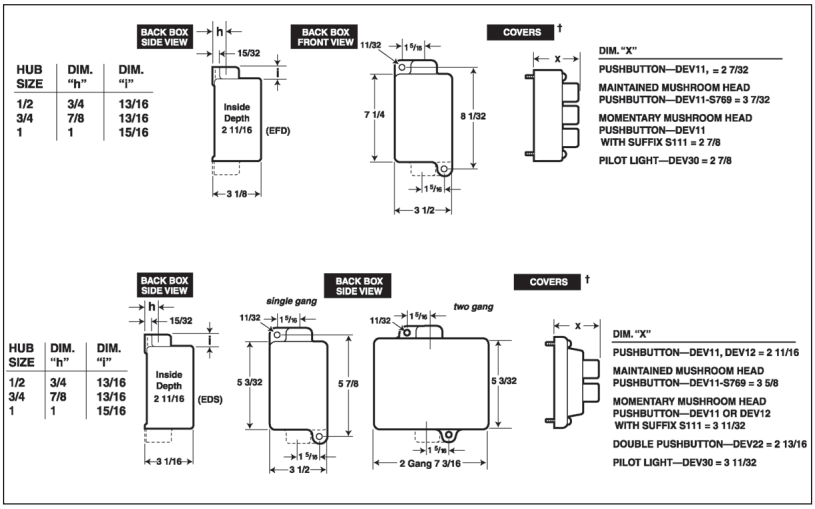
Options:

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:



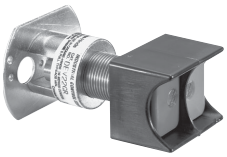
†Covers have same length and width as back boxes.
*For Class I, Division 1, Group B or Zone 1 Hydrogen applications, use the EFS(C) complete control station catalog numbers see page 528.

Crouse-Hinds by EATON

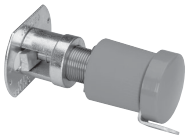
STEP 1 – Select Operator

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
Specify color for each pushbutton button (ex: DEV11G, DEV22GR). Color is black if unspecified.	
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**



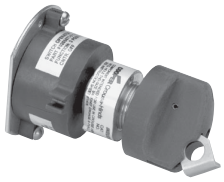
Pilot Light – factory sealed, incandescent lamp

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) (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		For use with 2 or 3 hole covers			
Cat. #	**Inscription**	**Cat. #**	**Inscription**	**Cat. #**	**Inscription**
DL101	Blank	**DL01**	Blank w/no fields	**DL32**	Open-Close
DL128	Run-Jog	**DL02**	Blank w/single field	**DL33**	Up-Down
DL129	Hand-Auto	**DL03**	Blank w/2 fields	**DL35**	In-Out
DL130	Forward-Reverse	**DL05**	Start	**DL36**	Raise-Lower
DL132	Open-Close	**DL06**	Stop	**DL37**	Start-Stop
DL133	Up-Down	**DL07**	On	**DL38**	Run-Off-Jog
DL135	In-Out	**DL08**	Off	**DL39**	Hand-Off-Auto
DL136	Raise-Lower	**DL09**	Run	**DL40**	For-Off-Rev
DL137	Start-Stop	**DL10**	Jog	**DL41**	Fast-Off-Slow
DL138	Run-Off-Jog	**DL11**	Trip	**DL42**	1-Off-2
DL139	Hand-Off-Auto	**DL12**	Reset	**DL43**	Open-Off-Close
DL140	For-Off-Rev	**DL13**	Test	**DL44**	Up-Off-Down
DL141	Fast-Off-Slow	**DL14**	Power On	**DL46**	Fast
DL142	1-Off-2	**DL15**	Hand	**DL47**	Slow
DL143	Open-Off-Close	**DL16**	Automatic	**DL48**	Off-On
DL144	Up-Off-Down	**DL17**	Emer Stop	**DL49**	Auto-Off-Hand
DL148	Off-On	**DL18**	Forward	**DL65**	Slow-Fast
DL149	Auto-Off-Hand	**DL19**	Reverse	**DL85**	Safe
DL165	Slow-Fast	**DL20**	Open	**DL86**	Safe-Run
DL186	Safe-Run	**DL21**	Close	**DL87**	Raise-Off-Lower
DL187	Raise-Off-Lower	**DL22**	Up	**DL88**	Slow-Off-Fast
DL188	Slow-Off-Fast	**DL23**	Down	**DL89**	Odd-Off-Even
DL189	Odd-Off-Even	**DL24**	In	**DL90**	Stop-Start
DL190	Stop-Start	**DL25**	Out	**DL91**	On-Off
DL191	On-Off	**DL26**	Raise	**DL92**	Fast-Slow
DL192	Fast-Slow	**DL27**	Lower	**DL93**	Local-Remote
DL193	Local-Remote	**DL28**	Run-Jog	**DL94**	Trip-Reset
DL194	Trip-Reset	**DL29**	Hand-Auto	**DL95**	Auto-Manual
DL195	Auto-Manual	**DL30**	Forward-Reverse	**DL96**	Start-Emer Stop
DL196	Start-Emer Stop			**DL97**	Alarm-Silence
DL197	Alarm-Silence			**DL98**	Maint-Manual
DL198	Maint-Manual			**DL99**	Test-Reset
DL199	Test-Reset				

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

STEP 4 – Select Cover

Covers

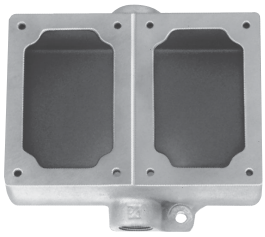
Description	Cat. #
Blank cover with single hole (Single gang)	**DS441**
Blank cover with 2 holes (Single gang)	**DS442**
Blank cover with 3 holes (To be used with EFD(C)1491-SA, 2491-SA or 3491-SA series of back boxes)	**DS443 SA**
Replacement cover plug for unused device operator openings	**206765**

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**

STEP 5 – Select Back Box

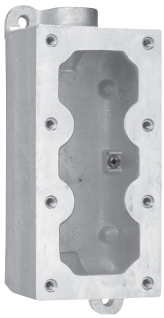
Back Boxes - for use with DS441 and DS442 covers or with 1 gang and 2 gang DS/DSD Series covers

Dead End	Through Feed	Hub Size	Back Box Arrangement
EDS171	**EDSC171**	½"	Single gang back box
EDS271	**EDSC271**	¾"	Single gang back box
EDS371	**EDSC371**	1"	Single gang back box
EFS172	**EFSC172**	½"	Double gang back box
EFS272	**EFSC272**	¾"	Double gang back box
EFS372	**EFSC372**	1"	Double gang back box



Options:	Suffix
Aluminum body	**SA**
Exterior epoxy powder coat finish	**S752**
Interior & exterior epoxy powder coat finish	**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**	½"	1½ gang back box
EFD2491 SA	**EFDC2491 SA**	¾"	1½ gang back box
EFD3491 SA	**EFDC3491 SA**	1"	1½ gang back box

Options	Suffix
Exterior epoxy powder coat finish	**S752**
Interior & exterior epoxy powder coat finish	**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

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	

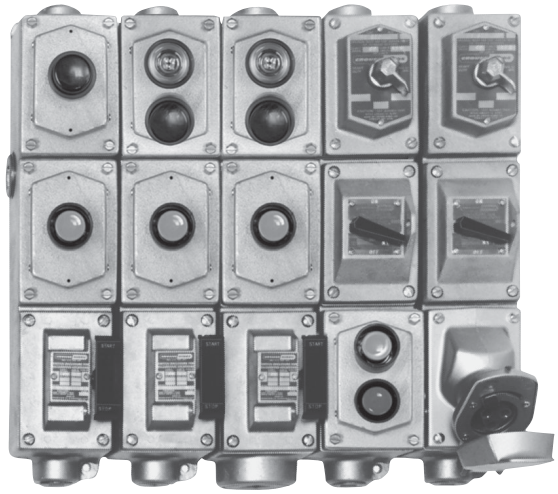
EDS / EFS Series Control Stations

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

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 1¼" 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 ¾" 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

Ordering Information

EDSCM21 EDSCM32† EDSCM62† EDSCM33‡ EDSCM63‡

Description	Through Feed Hub Size	Cat. #
Single Gang	¾"	**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.

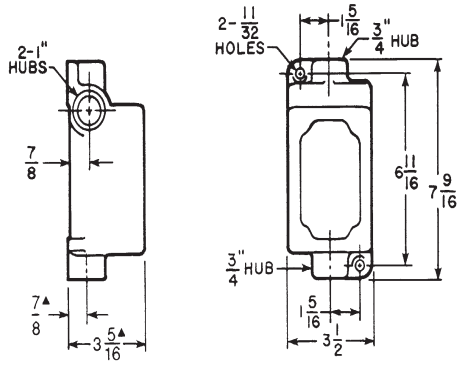
EDS / EFS Series Control Stations

EDSCM Modular Multi-Gang Control Device Bodies

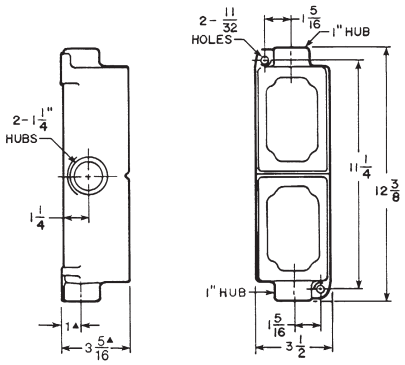
Cl. I, Div. 1, Groups C, D*
Cl. I, Div. 2, Groups B, C, D
Cl. II, Div. 1, Groups E, F, G
Cl. II, Div. 2, Groups F, G
Cl. III
NEMA 3, 7B (Div. 2) CD, 9EFG

Explosionproof
Dust-Ignitionproof
Raintight
Wet Locations

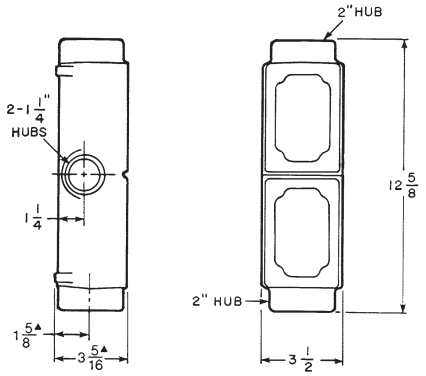
Dimensions
In Inches:



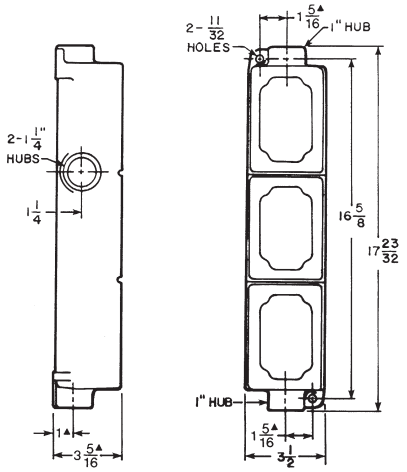
EDSCM21



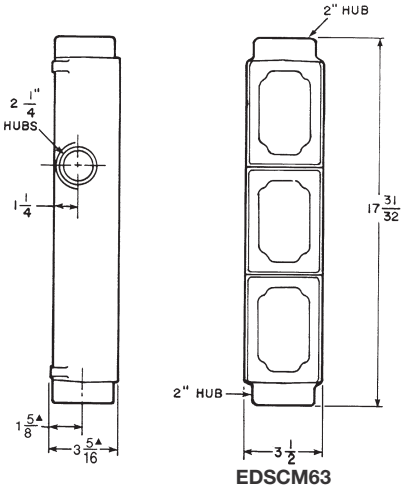
EDSCM32



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

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 ¼" 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 flametightness
- Accurately ground flange for flametight 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: 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. #
With Allen-Bradley Bulletin 600 Switches			
1	1	115–230	**DSD910** ①
2	1	115–230	**DSD911** ①
With General Electric Switches			
1	1	115–230	**DSD912** ①§
2	1	115–230	**DSD913** ①§
With Cutler-Hammer Switches			
1	1	115–230	**DSD914** ①§
2	1	115–230	**DSD915** ①§
With Arrow-Hart Switches Without Overload Protection			
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.

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 Cover Buttons	Normal Position	Diagram	Cat. #
1	1 Circuit Universal		**DSD918** ①
1	2 Circuits Universal		**DSD919** ①
	2 Circuits	A B	**DSD920** ①■
2	2 Circuits Universal		**DSD921** ①
2	2 Circuits Start-Stop unless otherwise specified	A B	**DSD922** ①■
2	2 Circuits Universal Mushroom Head		**DSD970** ①
3 (2-operator)	3 Circuits Universal		**DSD962** ①
3 (3-operator)	3 Circuits Universal		**DS511** ① **SA§**
3 (3-operator)	3 Circuits Universal Double pilot light - single pushbutton combo		**DS513** ① **SA§**
3 (3-operator)	3 Circuits Universal Double pushbutton - single pilot light combo		**DS514** ① **SA§**

Front Operated General Use Snap Switch

Style	Amperes 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 20 A, 18 VDC	**CPS152R** **(2 wire, 3 pole)**
30 A, 1½ HP, 125–250 VAC 60 Hertz; 7 A, ½ HP, 480 VAC, 60 Hertz	**CPS532R** **(2 wire, 3 pole)**
30 A, 3 HP, 125–250 VAC 60 Hertz; 7A, 1 HP, 480 VAC, 60 Hertz	**CPS732R** **(3 wire, 4 pole)**

General Purpose, Dead Front
Factory Sealed

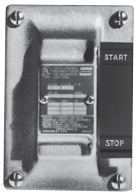
Rating	Cat. #	Diagram
20 A, 125 VAC	**ENR5201**	5-20R
20 A, 250 VAC	**ENR6202**	6-20R

①If 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.

Crouse-Hinds by EATON

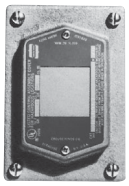


DSD951

DSD925

DSD947-J1-J1

DSD958



DSD957

DSD961-J1

For use with EDSCM 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 1 Open - A 1 Closed - B Start-Stop unless otherwise specified	A B	**DSD951** ③

Selector Switches
Maintained Contact 600 VAC Heavy Duty, Factory Sealed

	Style	Position 1	Position 2	Position 3	Cat. #
Two Position	Two Circuit	A1 A2			**DSD923** ④
	Four Circuit	A1 A2 B1 B2			**DSD924** ④
Three Position		A1 A2			**DSD925** ④
	Two Circuit	A1 A2 B1 B2			**DSD926** ④
	Four Circuit	A1 A2 B1 B2			**DSD927** ④

* 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.

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 A2	**DSD973** ① ④
2 position selector switch, four circuit (pos. 1 - N.O., pos. 2 - N.C. for both switches)	A1 A2 B1 B2	**DSD974** ① ④
3 position selector switch, two circuit (pos. 1 - N.O., pos. 2 - open, pos. 3 - N.C.)	A1 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 A2 B1 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 A2 B1 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

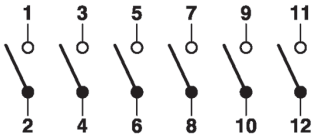
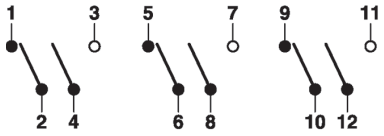
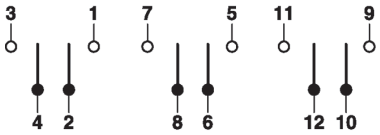
JOG, OFF, RUN	1, OFF, 2
AUTOMATIC, OFF, HAND	OPEN, OFF, CLOSE
FORWARD, OFF, REVERSE	UP, OFF, DOWN
FAST, OFF, SLOW	

EDS / EFS Series Control Stations

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

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

Ordering Information

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

Electrical Specification

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

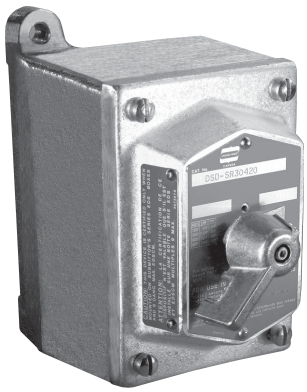
Maximum Current: 30 A

Heavy-duty A600 rating

Options:

Description	Suffix
Lockout for 2 position switch, handle in either position	**SX178**
Lockout for 3 position switch, handle in either position	**S349**

*For CEC applications only.



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

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 journalled shafts and bearings for front button operation, produces flametightness of enclosure joints
- On enclosures with front lever and side rocker type operating handles, threaded type shafts and bushings are used to ensure flametightness
- 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/EEMAC: 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	**S111**
• Lockout provision on front operated pushbutton cover (standard on buttons marked "OFF" and "STOP")	**S153**
• For 24 VDC operation on pilot lights	**S300**
• 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**
• Bodies and covers (single and two gang units) – copper-free aluminum	**SA**
• 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	**GB**
• 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)	**S769**
• Spring return to center from right and left	**S842**

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

*See suffix GB in Options section

EDS / EFS Series Control Stations

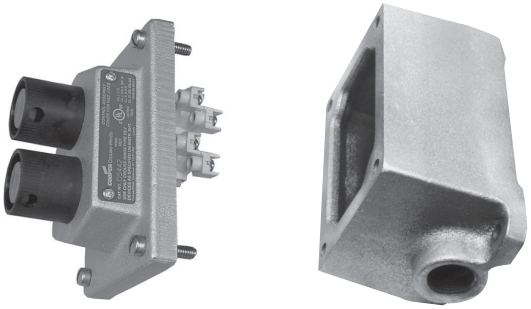
Fully Assembled EFS and EDS Factory Sealed Devices

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

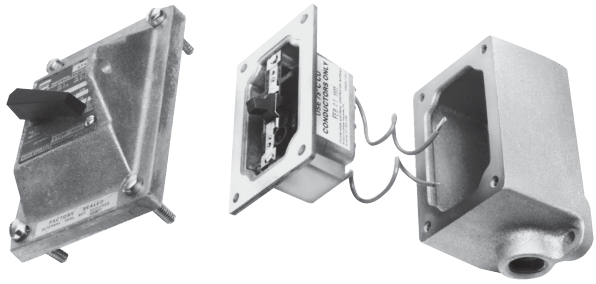
Methods of Factory Sealing

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

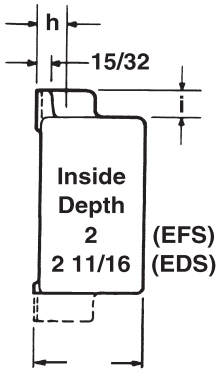


EDS factory sealed snap switches or manual motor starting switches do not need external sealing. The switches are enclosed in a unique sealing well with double flanges which mate with the cover and the body. Small, compact enclosures have accurately ground wide flanges on body, cover and sealing well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

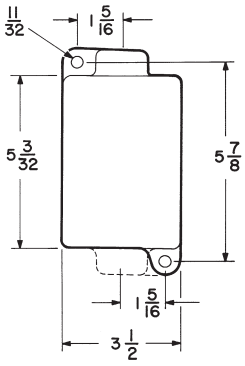
Dimensions (Inches) ‡

Bodies

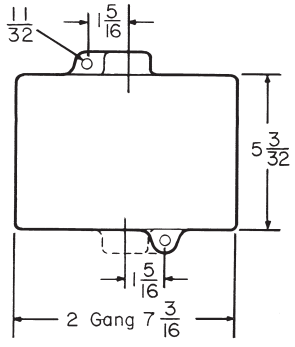
Hub Size	Dim. "h"	Dim. "i"
1/2	3/4	13/16
3/4	7/8	13/16
1	1	15/16



2 1/2 For EFS Series
3 1/16 For EDS Series
Side View

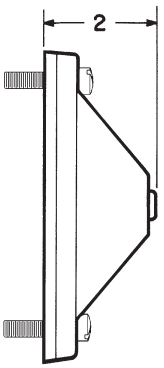


Front View - Single gang

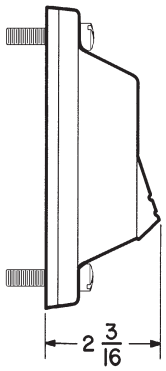


Front View - Two gang

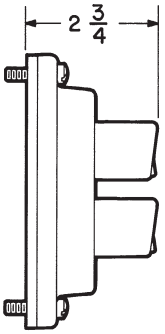
Covers†



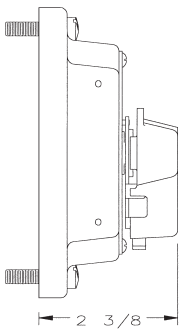
General use snap switch front operated and manual motor starting switch



Pushbutton switch rocker type side operated



Pushbutton switch front operated



Selector switch

*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

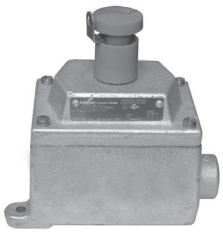
Fully Assembled EDS Factory Sealed Pushbutton Stations Front Operated, 600VAC Heavy Duty

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

Ordering Information - Single Gang

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

Replacement Pushbutton Contacts - see page 571

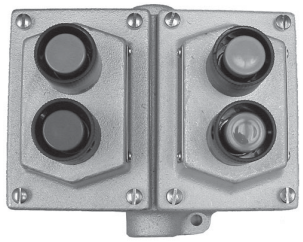


EDS2184 S769
Maintained Mushroom Head

EDS215

Enclosure with Pushbuttons

Hub Size	Cat. #	Cat. #	Cat. #	Cat. #§	Cat. #§
	Dead End				
½	**EDS1184** ①		**EDS115** ①		**EDS1155** ①
¾	**EDS2184** ①	**EDS2190** ①	**EDS215** ①	**EDS2192** ①	**EDS2155** ①
1	**EDS3184** ①	**EDS3190** ①	**EDS315** ①	**EDS3192** ①	**EDS3155** ①
	Through Feed				
½	**EDSC1184** ①	**EDSC1190** ①	**EDSC115** ①	**EDSC1192** ①	**EDSC1155** ①
¾	**EDSC2184** ①	**EDSC2190** ①	**EDSC215** ①	**EDSC2192** ①	**EDSC2155** ①
1	**EDSC3184** ①	**EDSC3190** ①	**EDSC315** ①	**EDSC3192** ①	**EDSC3155** ①



EDSC225

Dimensions

see page 526

Ordering Information - Two Gang

Normal Pos.	1 Circuit Universal	2 Circuits 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. #
	Dead End		
¾	**EDS2284** ①	**EDS2290** ①	**EDS225** ①
1	**EDS3284** ①	**EDS3290** ①	**EDS325** ①
	Through Feed		
½	**EDSC1284** ①	**EDSC1290** ①	**EDSC125** ①
¾	**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 1½" 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.

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 Universal	2 Circuits Universal	2 Circuits■	2 Circuits Universal	2 Circuits■
Marking	Specify	Specify	START-STOP unless otherwise specified	Specify	Specify
Diagram					
Replacement Pushbuttons‡	ED11	ED12	ED12■	ED12	ED12■

Enclosure with Pushbuttons

Hub Size	Cat. #	Cat. #	Cat. #	Cat. #§	Cat. #§
	Dead End				
½	**EFS1184** ①		**EFS115** ①		**EFS1155** ①
¾	**EFS2184** ①	**EFS2190** ①	**EFS215** ①	**EFS2192** ①	**EFS2155** ①
1	**EFS3184** ①	**EFS3190** ①	**EFS315** ①	**EFS3192** ①	**EFS3155** ①
	Through Feed				
½	**EFSC1184** ①	**EFSC1190** ①	**EFSC115** ①	**EFSC1192** ①	**EFSC1155** ①
¾	**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:

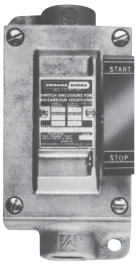
START	OFF	RESET	LIGHT ON	EMERGENCY	OPEN	DOWN	RAISE
STOP	RUN	TRIP	HAND	FORWARD	CLOSE	IN	LOWER
ON	JOG	TEST	AUTOMATIC	REVERSE	UP	OUT	

*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.

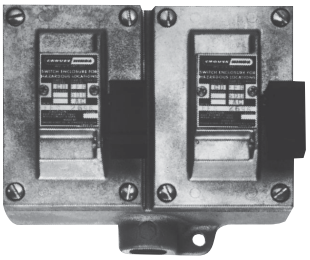
EDS / EFS Series Control Stations

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



EDSC2162



EDS2696

Dimensions
see page 526

Ordering Information - Single Gang

Normal Pos.	1 Circuit Universal	2 Circuits 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. #
	Dead End		
½	**EDS1596** ①		**EDS1162** ①
¾	**EDS2596** ①	**EDS2194** ①	**EDS2162** ①
1	**EDS3596** ①	**EDS3194** ①	**EDS3162** ①
	Through Feed		
½	**EDSC1596** ①	**EDSC1194** ①	**EDSC1162** ①
¾	**EDSC2596** ①	**EDSC2194** ①	**EDSC2162** ①
1	**EDSC3596** ①	**EDSC3194** ①	**EDSC3162** ①

Two Gang

Normal Pos.	1 Circuit Universal	2 Circuits 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. #
	Dead End		
¾	**EDS2696** ①	**EDS2294** ①	**EDS2262** ①
1	**EDS3696** ①	**EDS3294** ①	**EDS3262** ①
	Through Feed		
½	**EDSC1696** ①	**EDSC1294** ①	**EDSC1262** ①
¾	**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 1½" 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 – ½" 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

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 50–60 Hertz Transformer	Primary Voltage Range	Cat. # Suffix
220 / 110	220–240	**T2**
440 / 110	440–480	**T4**
550 / 110	550–600	**T5**

Ordering Information

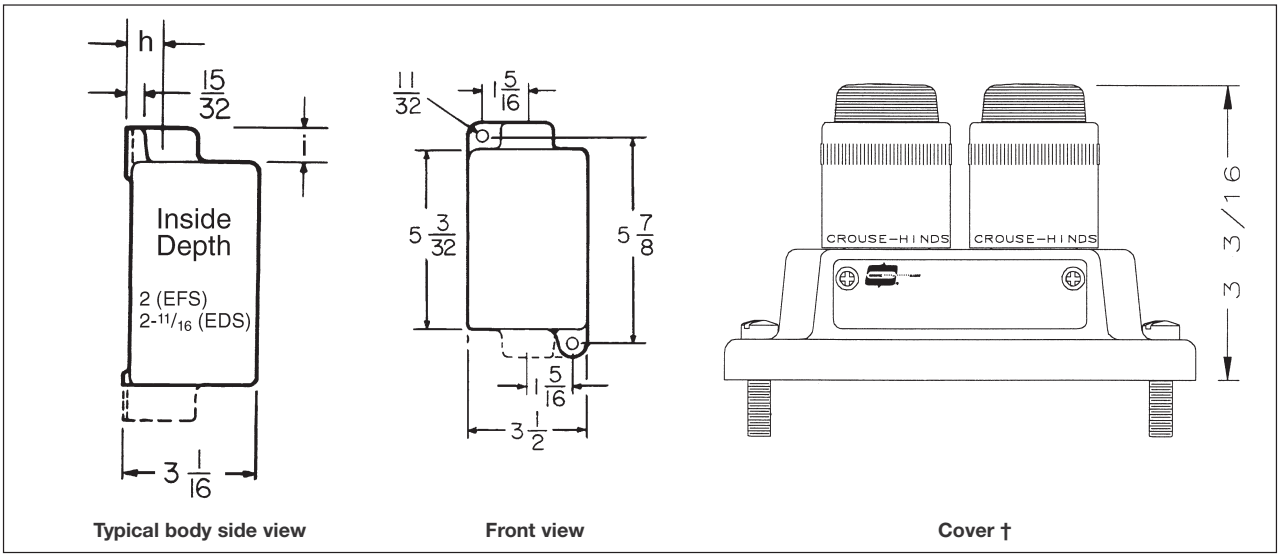
Enclosure with Single Pilot Light‡ Hub Size	Dead End Cat. #	Through Feed Cat. #
1/2	**EFS11524** ①	**EFSC11524** ①
3/4	**EFS21524** ①	**EFSC21524** ①
1	**EFS31524** ①	**EFSC31524** ①
Enclosure with Double Pilot Lights‡ Hub Size	**Dead End Cat. #**	**Through Feed Cat. #**
1/2	**EFS11561** ①	**EFSC11561** 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:



Typical body side view **Front view** **Cover †**

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.

4C EDS / EFS Series Control Stations

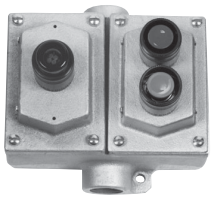
Fully Assembled EDS Factory Sealed Combination Pushbutton and Pilot Light Stations 600VAC, Heavy Duty

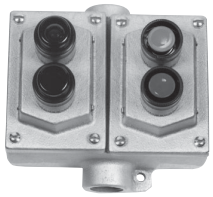
Cl. I, Div. 1 & 2, Groups B*, C, D
Cl. II, Div. 1, Groups E, F, G
Cl. II, Div. 2, Groups F, G
Cl. III
NEMA 3, 7B*CD, 9EFG

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

Ordering Information - Single Gang

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

Hub Size	Cat. #	Cat. #
½	**EDS11473** ①②	**EDSC11473** ①②
¾	**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. #	Cat. #	Cat. #
½	**EDS12471** ①②	**EDSC12471** ①②		
¾	**EDS22471** ①②	**EDSC22471** ①②	**EDS22868** ①②	**EDSC22868** ①②
1	**EDS32471** ①②	**EDSC32471** ①②	**EDS32868** ①②	**EDSC32868** ①②

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 stardard 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 1½" 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

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	Enclosure with Switch: Dead End Cat. #	Enclosure with Switch: Through Feed Cat. #
Two-Position, Two-Circuit	A1 / A2			ED11	½	**EDS11271** ①	**EDSC11271** ①
					¾	**EDS21271** ①	**EDSC21271** ①
					1	**EDS31271** ①	**EDSC31271** ①
Two-Position, Four-Circuit	A1 / A2			ED12	½	**EDS11272** ①	**EDSC11272** ①
					¾	**EDS21272** ①	**EDSC21272** ①
	B1 / B2				1	**EDS31272** ①	**EDSC31272** ①
Three-Position, Two-Circuit ‡	A1 / A2			ED11	½	**EDS11273** ①	**EDSC11273** ①
					¾	**EDS21273** ①	**EDSC21273** ①
					1	**EDS31273** ①	**EDSC31273** ①
Three-Position, Four-Circuit ‡	A1 / A2			ED12	½	**EDS11274** ①	**EDSC11274** ①
					¾	**EDS21274** ①	**EDSC21274** ①
	B1 / B2				1	**EDS31274** ①	**EDSC31274** ①
	A1 / A2			ED12	½	**EDS11275** ①	**EDSC11275** ①
					¾	**EDS21275** ①	**EDSC21275** ①
	B1 / B2				1	**EDS31275** ①	**EDSC31275** ①

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	

*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 1½" 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.

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	Enclosure with Switch: Dead End Cat. #	Enclosure with Switch: Through Feed Cat. #
Two-Position, Two-Circuit	A1 A2			ED11	½ ¾ 1	**EFS11271** ① **EFS21271** ① **EFS31271** ①	**EFSC11271** ① **EFSC21271** ① **EFSC31271** ①
Two-Position, Four-Circuit	A1 A2 B1 B2			ED12	½ ¾ 1	**EFS11272** ① **EFS21272** ① **EFS31272** ①	**EFSC11272** ① **EFSC21272** ① **EFSC31272** ①
Three-Position, Two-Circuit ‡	A1 A2			ED11	½ ¾ 1	**EFS11273** ① **EFS21273** ① **EFS31273** ①	**EFSC11273** ① **EFSC21273** ① **EFSC31273** ①
Three-Position, Four-Circuit ‡	A1 A2 B1 B2			ED12	½ ¾ 1	**EFS11274** ① **EFS21274** ① **EFS31274** ①	**EFSC11274** ① **EFSC21274** ① **EFSC31274** ①
	A1 A2 B1 B2			ED12	½ ¾ 1	**EFS11275** ① **EFS21275** ① **EFS31275** ①	**EFSC11275** ① **EFSC21275** ① **EFSC31275** ①

①If 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.

Crouse-Hinds by EATON

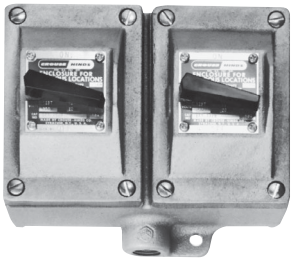
EDS / EFS Series Control Stations

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

EDSC2129



EDS2229

Dimensions
see page 526

Ordering Information - General Use Snap Switch – Front Operated

Hub Size	Style†	Amperes 120VAC§	Amperes 277VAC§	Single Gang Dead End Cat. #	Single Gang Through Feed Cat. #	Two Gang‡ Dead End Cat. #	Two Gang‡ Through Feed Cat. #	Factory Sealed Replacement Switch
3/4	1-pole	20	20	**EDS2129**	**EDSC2129†**	**EDS2229**	**EDSC2229†**	SW5
3/4	2-pole	20	20	**EDS218**	**EDSC218†**		**EDSC228†**	SW6
3/4	3-way	20	20	**EDS2130**	**EDSC2130**	**EDS2230**	**EDSC2230**	SW7
3/4	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

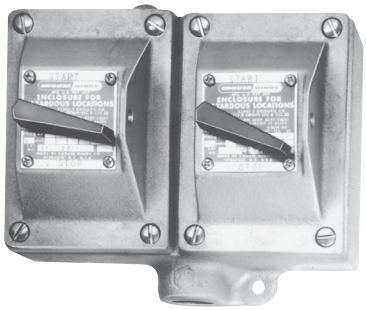
*Standard as Class I, Division 2, Group B. No seals required. For Class I, Division 1, Group B: All units on this page can be modified for Class I, Division 1, Group B usage. Add suffix GB to the Cat. No. Seals must be installed within 1½" of each conduit opening in Division 1.
† ON-OFF standard marking 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 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

EDSC2199



EDS2229

Ordering Information

With Allen-Bradley Bulletin 600 Switches

Maximum HP Ratings

Poles	115–230 Volts AC	115–230 Volts DC	Allen-Bradley Switch Cat. #
1	1 hp		**A B BUL 600 T0X4**
2	1 hp	¾ hp	**A B BUL 600 T0X5**

Poles	Hub Size in.	Dead End Cat. #	Through Feed Cat. #	Factory Sealed Replacement Switch
Single Gang				
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
Two Gang				
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. Motor Full-Load Amps	Eaton's Crouse-Hinds Symbol Number	Max. Motor Full-Load Amps	Eaton's Crouse-Hinds Symbol 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
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

With General Electric Switches

Maximum HP Ratings

Poles	115–230 Volts AC	115 Volts DC	230 Volts DC	G.E. Switch Cat. #
1	1 hp	1 hp	¼ hp	**CR101 Y**
2	1 hp	1 hp	1 hp	**CR101 H**

Poles	Hub Size in.	Dead End Cat. #	Through Feed Cat. #	Factory Sealed Replacement Switch
Single Gang				
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
Two Gang				
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

Ordering Information

With Cutler-Hammer Switches

Maximum HP Ratings

Poles	120–240 Volts AC	32 Volts DC	120 Volts DC	240 Volts DC	Cutler-Hammer Switch Cat. #
1	1 hp	¼ hp		¼ hp	**MST01**
2	1 hp	¼ hp	1 hp	1 hp	**MST02**

Poles	Hub Size in.	Dead End Cat. #	Through Feed Cat. #	Factory Sealed Replacement 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

①Heater Table (General Electric)

Max. Motor Full-Load Amps	Eaton's Crouse-Hinds Symbol Number	Max. Motor Full-Load Amps	Eaton's Crouse-Hinds Symbol Number
		3.01	G22
.48	G2	3.27	G23
.53	G3	3.56	G24
.58	G4	3.88	G25
.65	G5	4.22	G26
.71	G6	4.60	G27
.78	G7	5.00	G28
.86	G8	5.43	G29
.95	G9	5.90	G30
1.04	G10	6.41	G31
1.14	G11	6.98	G32
1.25	G12	7.60	G33
1.37	G13	8.25	G34
1.49	G14	8.95	G35
1.63	G15	9.75	G36
1.78	G16	10.60	G37
1.95	G17	11.40	G38
2.13	G18	12.50	G39
2.32	G19	13.60	G40
2.53	G20	14.80	G41
2.76	G21	16.00	G42

①Heater 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	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		

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.

4C EDS / EFS Series Control Stations

Fully Assembled EFS Fire Alarm Station

Cl. I, Div. 1, Groups B*, 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*CD, 9EFG

Explosionproof
Dust-Ignitionproof
Raintight
Wet Locations

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 1½" 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	Suffix
Where indicated in the catalog listings, units suitable for Class I, Division 1, Group B usage can be supplied.....	GB*

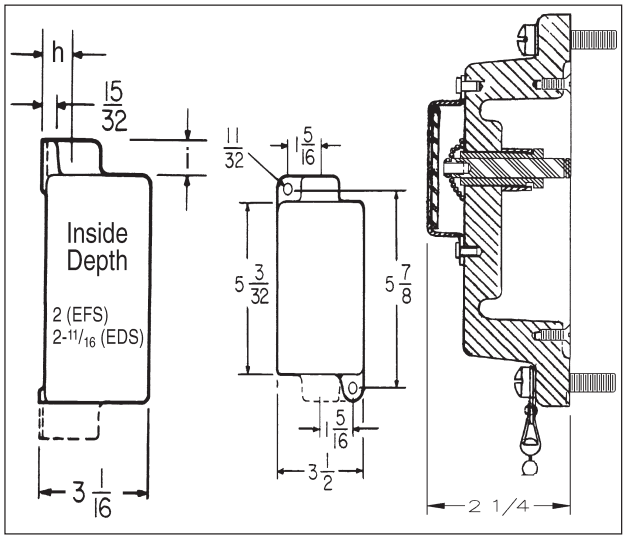
EFS21095

Ordering Information

Hub Size	Dead End Cat. #	Through Feed Cat. #
¾	EFS21095	EFSC21095

Dimensions

In Inches:



Typical body side view | Front view | Cover†

Hub Size	Dim."h"	Dim."i"
½	¾	13/16
¾	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 1½" of each conduit opening.

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 † 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

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

Control Stations and their Sub-assemblies

Complete Control Station	Sub-assembly		Notes and Requirements
	Cover & Device	Cast Back Box	
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 ¾" hub in back box (Ex. EDS2184). For ½" 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.

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 – ½" and ¾" 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

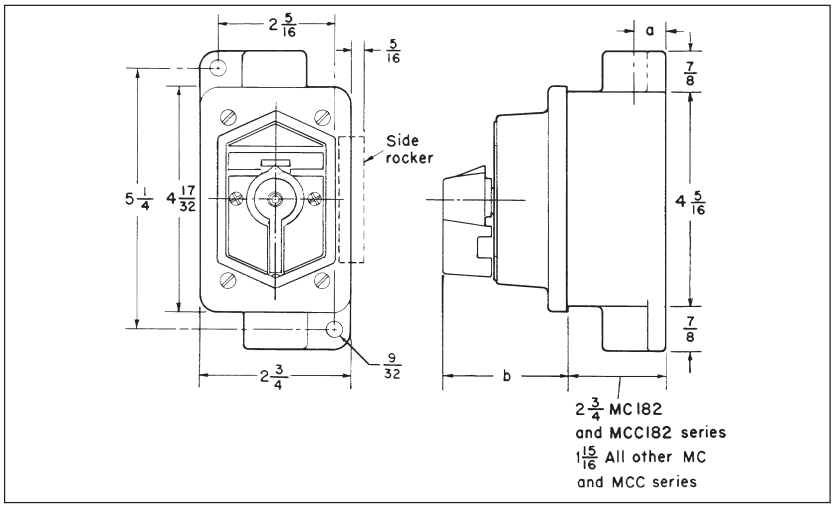
Options:

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 pilot lights in place of standard incandescent pilot lamps	LED

Dimensions

In Inches*:



Hub size	a	Type of Cover	b
½	⅝	Side Rocker Handle	1½
¾	¾	Front Pushbutton	2⅜
		Selector Switch	2⅜
		Pilot Light	1 1/16

*Dimensions are approximate, not for construction purposes.

MC dead end side rocker handle

MCC through feed side rocker handle

MC dead end front pushbutton

MCC 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	½ ¾	**MC1810U1** ① **MC2810U1** ①	**MCC1810U1** ① **MCC2810U1** ①
2 Circuits Universal	Specify		ED12	½ ¾	**MC1810U** ① **MC2810U** ①	**MCC1810U** ① **MCC2810U** ①
2 Circuits 1 Open - A 1 Closed - B	START-STOP unless otherwise specified		ED12*	½ ¾	**MC1810** ① **MC2810** ①	**MCC1810** ① **MCC2810** ①

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	½ ¾	**MC1910U1** ① **MC2910U1** ①	**MCC1910U1** ① **MCC2910U1** ①
2 Circuits Universal	Specify		ED12	½ ¾	**MC1910U** ① **MC2910U** ①	**MCC1910U** ① **MCC2910U** ①
2 Circuits 1 Open - A 1 Closed - B	START-STOP unless otherwise specified		ED12*	½ ¾	**MC1910** ① **MC2910** ①	**MCC1910** ① **MCC2910** 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	

*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 A2			ED11	½ ¾	**MC11271** ① **MC21271** ①	**MCC11271** ① **MCC21271** ①
Two-Position, Four-Circuit	A1 A2 B1 B2			ED12	½ ¾	**MC11272** ① **MC21272** ①	**MCC11272** ① **MCC21272** ①
Three-Position, Two-Circuit †	A1 A2			ED11	½ ¾	**MC11273** ① **MC21273** ①	**MCC11273** ① **MCC21273** ①
Three-Position, Four-Circuit †	A1 A2 B1 B2			ED12	½ ¾	**MC11274** ① **MC21274** ①	**MCC11274** ① **MCC21274** ①
	A1 A2 B1 B2			ED12	½ ¾	**MC11275** ① **MC21275** ①	**MCC11275** ① **MCC21275** 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	

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	½	**MC180 J1**	**MCC180 J1**
110–125	Candelabra	6	¾	**MC-280-J1**	**MCC280 J1**
220–250	Intermediate	10	½	**MC184 J1**	**MCC184 J1**
220–250	Intermediate	10	¾	**MC-284-J1**	**MCC284 J1**
440–480	Candelabra	6	½	**MC182 J1**	**MCC182 J1**
440–480	Candelabra	6	¾	**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 – ½", ¾", 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

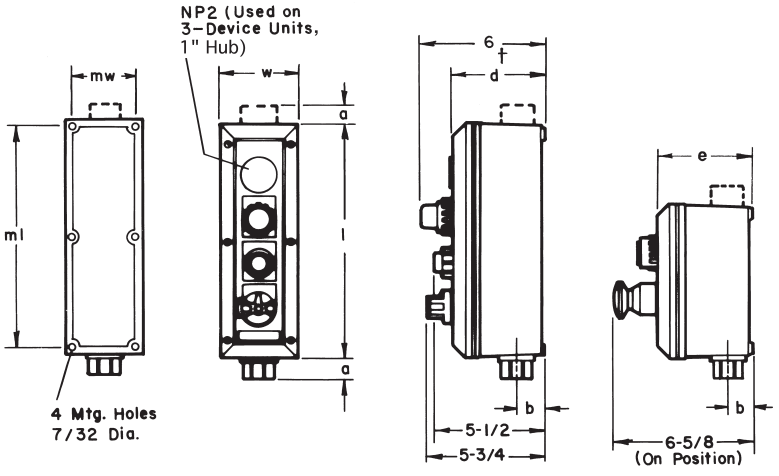
Options:

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

Description	Suffix
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:



Maintained Stop Pushbutton

† Use dimension "e" for control station with 1" hub or maintained stop pushbutton.

Dimensions are approximate, not for construction purposes.

N2S(C) Body Style	Outside Dims. l	w	(NCS)* d	(NCD)* e	Mounting Dims. ml	mw	½" & ¾" Hubs a	b	1" Hubs a	b
1 or 2 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 devices	11 3/4	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 ½" and ¾" 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

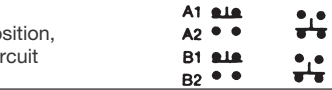
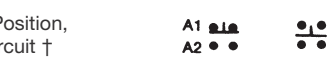
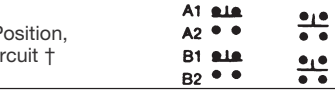
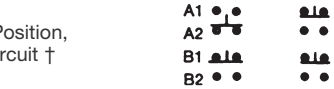
Factory Sealed, Corrosion-Resistant 600VAC Heavy Duty

Cl. I, Div. 2, Groups B, C, D
NEMA 3, 4X, 7BCD (Div. 2), 12
Watertight
Weatherproof
Dust-tight

Ordering Information - With Pilot Lights‡*

No. Units	Diagram	Volts	Enclosure with Pilot Lights ½" Hubs Dead End Cat. #	½" Hubs Through Feed Cat. #	¾" Hubs Dead End Cat. #	¾" Hubs Through Feed Cat. #	1" Hubs Dead End Cat. #	1" Hubs Through 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 1	2	3	Marking Unless Otherwise Specified	Enclosure With Selector Switch Hub Size	Dead End Cat. #	Through Feed Cat. #
Two-Position, Two-Circuit				START-STOP (or Specify)	½ ¾ 1	**N2S1121** ② **N2S2121** ② **N2S3121** ②	**N2SC1121** ② **N2SC2121** ② **N2SC3121** ②
Two-Position, Four-Circuit				START-STOP (or Specify)	½ ¾ 1	**N2S1122** ② **N2S2122** ② **N2S3122** ②	**N2SC1122** ② **N2SC2122** ② **N2SC3122** ②
Three-Position, Two-Circuit †				Specify	½ ¾ 1	**N2S1123** ② **N2S2123** ② **N2S3123** ②	**N2SC1123** ② **N2SC2123** ② **N2SC3123** ②
Three-Position, Four-Circuit †				Specify	½ ¾ 1	**N2S1124** ② **N2S2124** ② **N2S3124** ②	**N2SC1124** ② **N2SC2124** ② **N2SC3124** ②
Three-Position, Four-Circuit †				Specify	½ ¾ 1	**N2S1125** ② **N2S2125** ② **N2S3125** ②	**N2SC1125** ② **N2SC2125** ② **N2SC3125** 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:		Selector Switches – Two-Position:	Selector Switches – Three-Position:
START	REVERSE		
STOP	OPEN	RUN-JOG	RUN-OFF-JOG
ON	CLOSE	HAND-AUTO	HAND-OFF-AUTO
OFF	UP	FOR-REV	FOR-OFF-REV
RUN	DOWN	FAST-SLOW	FAST-OFF-SLOW
JOG	IN	OPEN-CLOSE	1-OFF-2
TRIP	OUT	UP-DOWN	OPEN-OFF-CLOSE
RESET	RAISE	ON-OFF	UP-OFF-DOWN
TEST	LOWER	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.

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 (or Specify)	½	**N2S1110** ②	**N2SC1110** ②
			¾	**N2S2110** ②	**N2SC2110** ②
			1	**N2S3110** ②	**N2SC3110** ②
2		START-STOP (or Specify)	½	**N2S1210** ②	**N2SC1210** ②
			¾	**N2S2210** ②	**N2SC2210** ②
			1	**N2S3210** ②	**N2SC3210** ②
3		Specify	½	**N2S1310** ②	**N2SC1310** ②
			¾	**N2S2310** ②	**N2SC2310** ②
			1	**N2S3310** ②	**N2SC3310** ②
4		Specify	½	**N2S1410** ②	**N2SC1410** ②
			¾	**N2S2410** ②	**N2SC2410** ②
			1	**N2S3410** ②	**N2SC3410** ②

Ordering Information - Combination Control Stations

Pilot Lights*	Pushbuttons	Diagram	Markings	Enclosure With Pushbuttons and Pilot Lights Hub Size	Volts	Dead End Cat. #	Through Feed Cat. #	Volts	Dead End Cat. #	Through Feed Cat. #
1	1		Specify	½		**N2S12411** ①②	**N2SC12411** ①②		**N2S12414** ①②	**N2SC12414** ①②
				¾	120	**N2S22411** ①②	**N2SC22411** ①②	480	**N2S22414** ①②	**N2SC22414** ①②
				1		**N2S32411** ①②	**N2SC32411** ①②		**N2S32414** ①②	**N2SC32414** ①②
				½		**N2S12412** ①②	**N2SC12412** ①②		**N2S12415** ①②	**N2SC12415** ①②
				¾	240	**N2S22412** ①②	**N2SC22412** ①②	600	**N2S22415** ①②	**N2SC22415** ①②
				1		**N2S32412** ①②	**N2SC32412** ①②		**N2S32415** ①②	**N2SC32415** ①②
1	2		Specify	½		**N2S13421** ①②	**N2SC13421** ①②		**N2S13424** ①②	**N2SC13424** ①②
				¾	120	**N2S23421** ①②	**N2SC23421** ①②	480	**N2S23424** ①②	**N2SC23424** ①②
				1		**N2S33421** ①②	**N2SC33421** ①②		**N2S33424** ①②	**N2SC33424** ①②
				½		**N2S13422** ①②	**N2SC13422** ①②		**N2S13425** ①②	**N2SC13425** ①②
				¾	240	**N2S23422** ①②	**N2SC23422** ①②	600	**N2S23425** ①②	**N2SC23425** ①②
				1		**N2S33422** ①②	**N2SC33422** ①②		**N2S33425** ①②	**N2SC33425** ①②
2	1		Specify	½		**N2S13411** ①②	**N2SC13411** ①②		**N2S13414** ①②	**N2SC13414** ①②
				¾	120	**N2S23411** ①②	**N2SC23411** ①②	480	**N2S23414** ①②	**N2SC23414** ①②
				1		**N2S33411** ①②	**N2SC33411** ①②		**N2S33414** ①②	**N2SC33414** ①②
				½		**N2S13412** ①②	**N2SC13412** ①②		**N2S13415** ①②	**N2SC13415** ①②
				¾	240	**N2S23412** ①②	**N2SC23412** ①②	600	**N2S23415** ①②	**N2SC23415** ①②
				1		**N2S33412** ①②	**N2SC33412** ①②		**N2S33415** ①②	**N2SC33415** ①②
2	2		Specify	½		**N2S14421** ①②	**N2SC14421** ①②		**N2S14424** ①②	**N2SC14424** ①②
				¾	120	**N2S24421** ①②	**N2SC24421** ①②	480	**N2S24424** ①②	**N2SC24424** ①②
				1		**N2S34421** ①②	**N2SC34421** ①②		**N2S34424** ①②	**N2SC34424** ①②
				½		**N2S14422** ①②	**N2SC14422** ①②		**N2S14425** ①②	**N2SC14425** ①②
				¾	240	**N2S24422** ①②	**N2SC24422** ①②	600	**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

Ordering Information - Combination Control Stations

Pilot Lights*‡	Push buttons	Selector Switches Position No.† 1	2	3	Markings	Enclosure With Pilot Light, Pushbuttons and Selector Switch: Hub Size	Volts	Dead End Cat. #	Through Feed Cat. #	Volts	Dead End Cat. #	Through Feed Cat. #
1	2	2-Pos, 2-Cct				½		**N2S145211** ①②	**N2SC145211** ①②		**N2S145214** ①②	**N2SC145214** ①②
						¾	120	**N2S245211** ①②	**N2SC245211** ①②	480	**N2S245214** ①②	**N2SC245214** ①②
						1		**N2S345211** ①②	**N2SC345211** ①②		**N2S345214** ①②	**N2SC345214** ①②
					Specify	½		**N2S145212** ①②	**N2SC145212** ①②		**N2S145215** ①②	**N2SC145215** ①②
						¾	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				½		**N2S145231** ①②	**N2SC145231** ①②		**N2S145234** ①②	**N2SC145234** ①②
						¾	120	**N2S245231** ①②	**N2SC245231** ①②	480	**N2S245234** ①②	**N2SC245234** ①②
						1		**N2S345231** ①②	**N2SC345231** ①②		**N2S345234** ①②	**N2SC345234** ①②
					Specify	½		**N2S145232** ①②	**N2SC145232** ①②		**N2S145235** ①②	**N2SC145235** ①②
						¾	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.

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 ¾" 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)

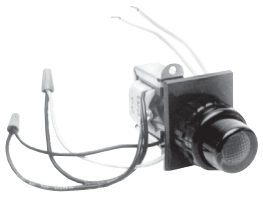
No. of Devices	Without Hubs Cat. #	With One Hub ½" Cat. #	With Two Hub ½" Cat. #	With One Hub ¾" Cat. #	With Two Hub ¾" Cat. #	With One Hub 1" Cat. #	With Two Hub 1" Cat. #
1	**NCD01**	**NCD11**	**NCDC11**	**NCD21**	**NCDC21**	**NCD31**	**NCDC31**
2	**NCD02**	**NCD12**	**NCDC12**	**NCD22**	**NCDC22**	**NCD32**	**NCDC32**
3	**NCD03**	**NCD13**	**NCDC13**	**NCD23**	**NCDC23**	**NCD33**	**NCDC33**
4	**NCD04**	**NCD14**	**NCDC14**	**NCD24**	**NCDC24**	**NCD34**	**NCDC34**

No. of Devices	Without Hubs Cat. #	With One Hub (¾") Cat. #	With Two Hub (¾") Cat. #	With One Hub (½") Cat. #	With Two Hub (½") 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

Pushbutton Stations – Momentary Contact

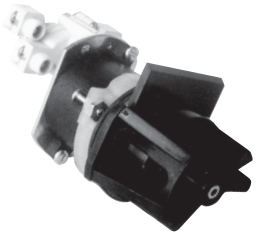
Color of Operator	1 Circuit Contact Symbol	1 Circuit Universal Cat. #	2 Circuit Contact Symbol	2 Circuit Universal Cat. #
Natural		**N2PS1111** ②		**N2PS1211** ②
Red		**N2PS1111R** ②		**N2PS1211R** ②
Green		**N2PS1111G** ②		**N2PS1211G** ②
Red Mushroom Head		**N2PM1111 S111** ②		

Closure Plug

Description	Cat. #
Closure Plug	**NP2**

Selector Switches

Style	Position 1	Position 2	Position 3	Cat. #
Two Position Two Circuit	A1 A2			**N2SW11211** ②
Two Position Four Circuit	A1 A2 B1 B2			**N2SW12221** ②
Three Position Two Circuit †	A1 A2			**N2SW11311** ②
Three Position Four Circuit †	A1 A2 B1 B2			**N2SW12321** ②
Three Position Four Circuit †	A1 A2 B1 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:		Selector Switches – Two-Positions:	Selector Switches – Three-Position:
START	REVERSE	RUN-JOG	RUN-OFF-JOG
STOP	OPEN	HAND-AUTO	HAND-OFF-AUTO
ON	CLOSE	FOR-REV	FOR-OFF-REV
OFF	UP	FAST-SLOW	FAST-OFF-SLOW
RUN	DOWN	OPEN-CLOSE	1-OFF-2
JOG	IN	UP-DOWN	OPEN-OFF-CLOSE
TRIP	OUT	ON-OFF	UP-OFF-DOWN
RESET	RAISE	IN-OUT	
TEST	LOWER	RAISE-LOWER	
LIGHT ON		START-STOP	
HAND			
AUTOMATIC			
EMERGENCY			
FORWARD			

† Suffixes S634 or S635 may be used on these catalog numbers. See explanation in Options section.

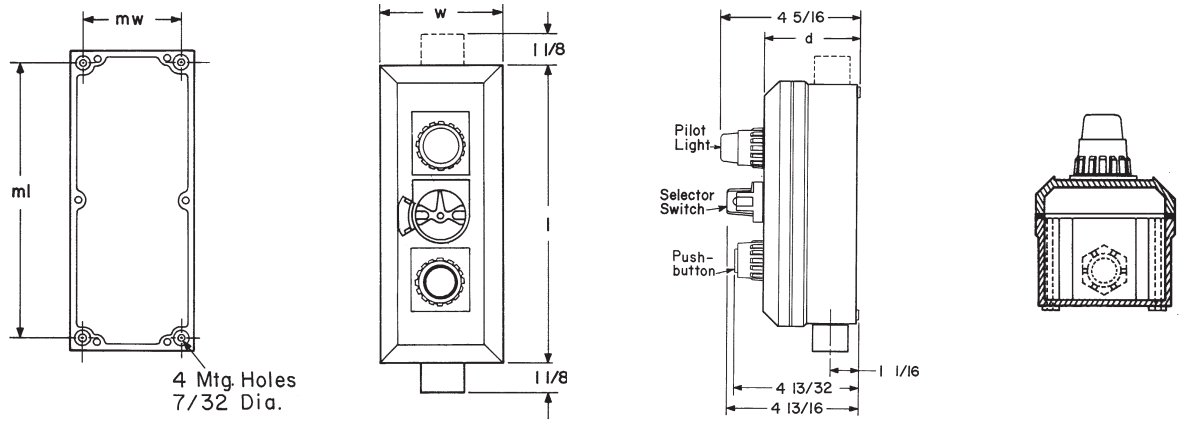
N2S and N2SC Series Control Stations

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:



N2S

For 1/2" and 3/4" hub sizes (for 1" hub and/or MSR option, see page 544).

NCS(C) Body Style	Outside Dimensions l	w	d	Mounting Dimensions 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 5/8	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_2
IP66

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 – ½" and ¾" 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

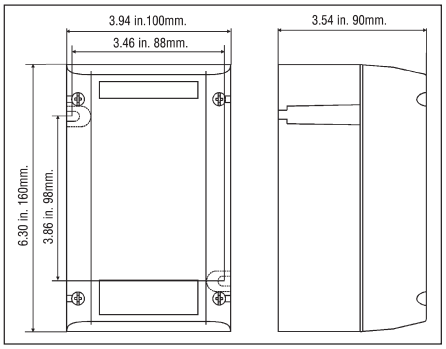
Options:

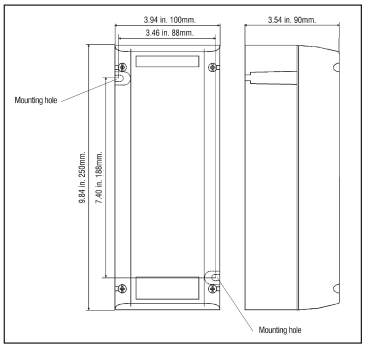
Description	Suffix
Padlock attachments for all pushbuttons. For "START-STOP" stations, only "STOP" button provided with lockout (lockout standard with STOP)	S708
Three-position selector switches with modified operation:	
Momentary contact clockwise operation, spring return to center, maintained contact counterclockwise operation	S634
Momentary contact counterclockwise operation, spring return to center, maintained contact clockwise operation	S635
One maintained stop pushbutton	MSR1

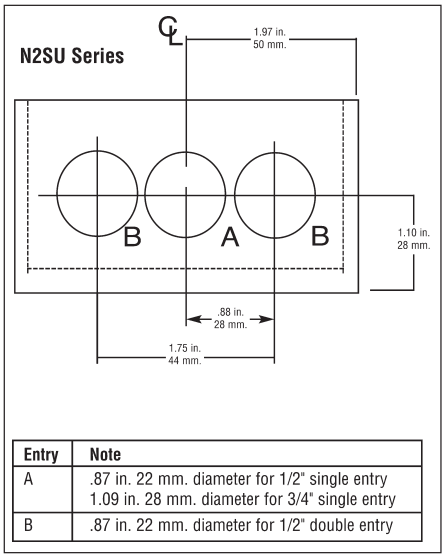
Note: In addition to hub arrangements shown, the following can be obtained by inserting these codes for the 4th and 5th character in the catalog number:
D = Double ½" hubs at bottom
CD = Single hub at top, double ½" hubs at bottom
DD = Double ½" hubs at each end

Dimensions

In Inches:







Entry	Note
A	.87 in. 22 mm. diameter for 1/2" single entry 1.09 in. 28 mm. diameter for 3/4" single entry
B	.87 in. 22 mm. diameter for 1/2" double entry

N2SU/N2SCU Control Stations

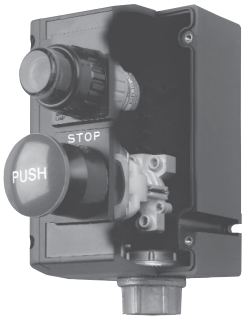
Factory Sealed, Corrosion-Resistant 600VAC Heavy Duty

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_2
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 (or Specify)	½ ¾	**N2S1110U** ② **N2S2110U** ②	**N2SC1110U** ② **N2SC2110U** ②
2		START-STOP (or Specify)	½ ¾	**N2S1210U** ② **N2S2210U** ②	**N2SC1210U** ② **N2SC2210U** ②
3		Specify	½ ¾	**N2S1310U** ② **N2S2310U** ②	**N2SC1310U** ② **N2SC2310U** ②
4		Specify	½ ¾	**N2S1410U** ② **N2S2410U** ②	**N2SC1410U** ② **N2SC2410U** ②



Maintained pushbutton with pilot light control station

Ordering Information - With Selector Switches*

Style	Position 1	Position 2	Position 3	Marking Unless Otherwise Specified	Enclosure with One Selector Switch Hub Size	Dead End Cat. #	Through Feed Cat. #
Two-Position, Two-Circuit	A1 A2			START-STOP (or Specify)	½ ¾	**N2S1121U** ② **N2S2121U** ②	**N2SC1121U** ② **N2SC2121U** ②
Two-Position, Four-Circuit	A1 A2 B1 B2			START-STOP (or Specify)	½ ¾	**N2S1122U** ② **N2S2122U** ②	**N2SC1122U** ② **N2SC2122U** ②
Three-Position, Two-Circuit	A1 A2			Specify	½ ¾	**N2S1123U** ② **N2S2123U** ②	**N2SC1123U** ② **N2SC2123U** ②
Three-Position, Four-Circuit	A1 A2 B1 B2			Specify	½ ¾	**N2S1124U** ② **N2S2124U** ②	**N2SC1124U** ② **N2SC2124U** ②
Three-Position, Four-Circuit	A1 A2 B1 B2			Specify	½ ¾	**N2S1125U** ② **N2S2125U** ②	**N2SC1125U** ② **N2SC2125U** ②

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

Marking

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

Selector Switches – Two-Position:
RUN-JOG
HAND-AUTO
FOR-REV
FAST-SLOW
OPEN-CLOSE
UP-DOWN
ON-OFF
IN-OUT
RAISE-LOWER
START-STOP

Selector Switches – Three-Position
RUN-OFF-JOG
HAND-OFF-AUTO
FOR-OFF-REV
FAST-OFF-SLOW
1-OFF-2
OPEN-OFF-CLOSE
UP-OFF-DOWN

*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_2
IP66

Ordering Information - With Pilot Lights - Transformer Type

No. Units	Diagram	Volts	Enclosure with Pilot Lights† ½" Hubs Dead End Cat. #	½" Hubs Through Feed Cat. #	¾" Hubs Dead End Cat. #	¾" Hubs 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.

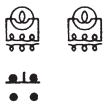
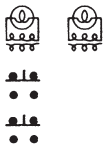
N2SU/N2SCU Control Stations

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_2
IP66

Ordering Information - Combination Control Stations†*

Pilot Lights*	Pushbuttons	Diagram	Marking Unless Otherwise Specified	Volts	Enclosure with Push Buttons and Pilot Lights† ½" Hubs Dead End Cat. #	½" Hubs Through Feed Cat. #	¾" Hubs Dead End Cat. #	¾" Hubs 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

Pilot Lights*	Pushbuttons	Selector Switches Position No. 1	2	3	Markings	Enclosure With Pilot Light, Pushbuttons and Selector Switch Hub Size in.	Volts	Dead End Cat. #	Through Feed Cat. #
1	2	Two-Position, Two-Circuit			Specify	½	120	**N2S145211U** ①②	**N2SC145211U** ①②
						¾		**N2S245211U** ①②	**N2SC245211U** ①②
						½	240	**N2S145212U** ①②	**N2SC145212U** ①②
						¾		**N2S245212U** ①②	**N2SC245212U** ①②
1	2	Three-Position, Two-Circuit			Specify	½	120	**N2S145231U** ①②	**N2SC145231U** ①②
						¾		**N2S245231U** ①②	**N2SC245231U** ①②
						½	240	**N2S145232U** ①②	**N2SC145232U** ①②
						¾		**N2S245232U** ①②	**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	RUN-OFF-JOG
STOP	REVERSE	HAND-AUTO	HAND-OFF-AUTO
ON	OPEN	FOR-REV	FOR-OFF-REV
OFF	CLOSE	FAST-SLOW	FAST-OFF-SLOW
RUN	UP	OPEN-CLOSE	1-OFF-2
JOG	DOWN	UP-DOWN	OPEN-OFF-CLOSE
TRIP	IN	ON-OFF	UP-OFF-DOWN
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.

N2FA and N2FAC Fire Alarm Stations

Cl. I, Div. 2, Groups B, C, D
NEMA 3, 7BCD (Div. 2), 12
Raintight
Wet Locations

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 – ½", ¾" and 1" sizes.

Certifications and Compliances:

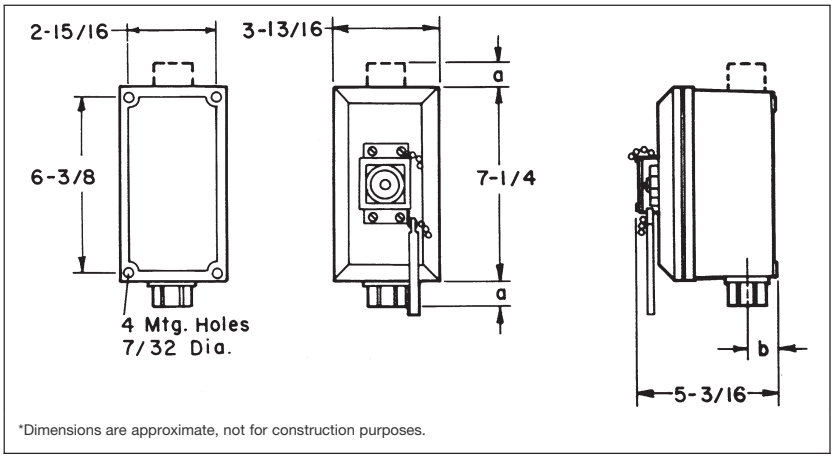
- NEC:
  Class I, Division 2, Groups B, C, D
- NEMA 3, 7BCD (Division 2), 12

Ordering Information

Hub Size	Dead End Cat. #	Through Feed Cat. #	Replacement Glass Cat. #
½	N2FA11	N2FAC11	DS K14
¾	N2FA21	N2FAC21	DS K14
1	N2FA31	N2FAC31	DS K14

Dimensions*

In Inches:



*Dimensions are approximate, not for construction purposes.

½" & ¾" Hubs		1" Hubs	
a	b	a	b
1⅛	1 1/16	1¼	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_2 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:

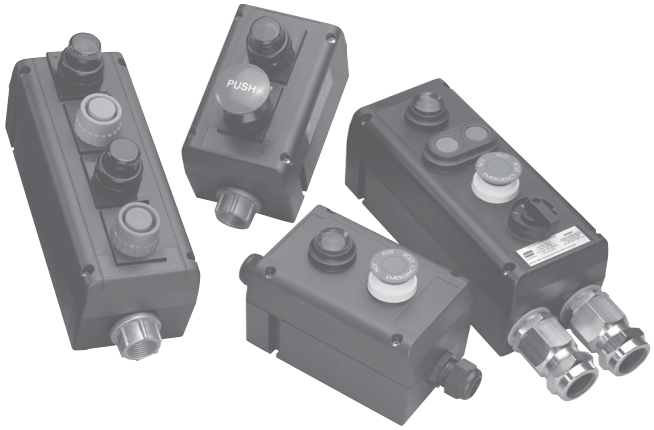
- NEMA 4X, IP66 enclosure with formed-in-place gasket
- Available with all operators: indicator lights, potentiometers, control switches, pushbuttons, terminal blocks and meters
- Base-mounted contact blocks
- Easy change-out components snap in place on DIN rail
- Enclosure meets UL 94-VO. Also available 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:

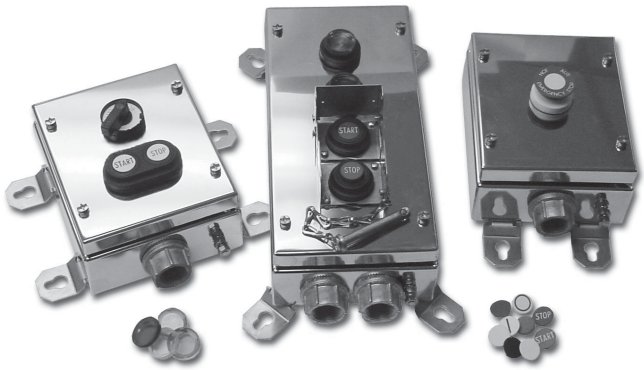
- UL/cUL Listed
- Class I, Div. 2, Groups A, B, C, D
- Class II, Div. 1, Groups E, F, G (cUL)
- Class I, Zones 1 and 2, Ex de IIB + H2, T6
- AEx de IIB + H2, T6
- Type 3, 4, 4X; IP66
- CENELEC-PTB 00 ATEX 3117
- Ex de IIC, T6, Zones 1 and 2, IP66

Options:

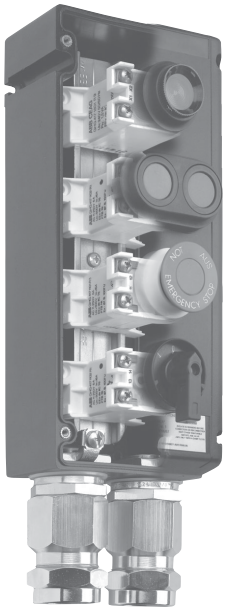
Description	Suffix
Eaton's Crouse-Hinds GHG43 Series control stations are now available with 316L stainless steel enclosures, making them ideal for corrosive and adverse locations - especially offshore platform applications	**S860**



GHG43 Nonmetallic Control Stations

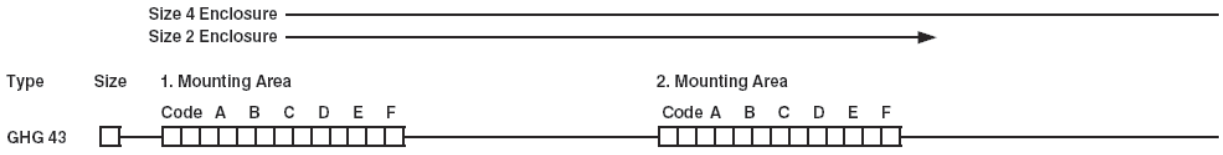


GHG43 Stainless Steel Control Stations

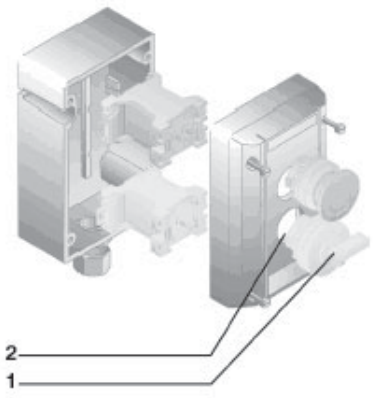


Crouse-Hinds by EATON

Nonmetallic or 316L Stainless Steel Corrosion Resistant



GHG43 2 - Size 2 Enclosure



Mounting Area*

Pushbutton DRT

Code A: D R T O | B | C | D

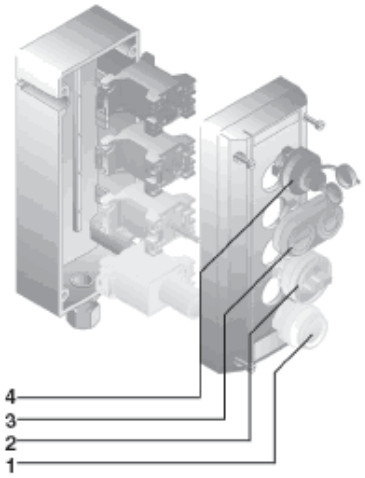
Codes see page 559

Double Pushbutton

Code A: D D T O | B | C | D | E

Codes see page 559

GHG43 4 - Size 4 Enclosure



Mounting Area*

Key Operated Pushbutton

Code A: S L T O | B | C

Codes see page 559

Mushroom-Head Pushbutton

Code A: S G T | B | C | D | E | F

Codes see page 560

Signal Lamp

Code A: S I L | 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.

GHG43 Series Control Stations

How to build a GHG43 Series Catalog Number‡

Nonmetallic or 316L Stainless Steel Corrosion Resistant

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

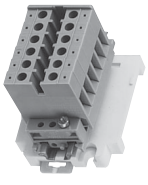
Code A S C T **B** ☐ **C** ☐☐ **D** ☐

Codes see pages 563–564

Control Switch Ex 23 10A

Code A E X 2 3 **B** ☐☐ **C** ☐☐ **D** ☐ **E** ☐

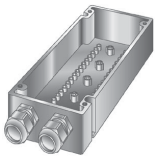
Codes see pages 563–564
Requires 2 spaces



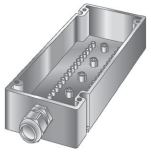
Terminals and cover blanking plug

Code A K L M **B** ☐☐

Code see page 561



Two entries



One entry

Cable Entries

NPT	Metric
0 0 No entries	0 0 No entries
1 2 2 x ½" Myers Hub, STGK1 Zinc Gland plate	0 1 2 x M25 Plastic Cable gland M25 Blanking plug
1 3 2 x ¾" Myers Hub, STGK2 Zinc Gland plate (Stainless Steel Control Stations only)	0 2 2 x M20 Threaded entries Gland plate
2 2 2 x ½" Myers Hub, SSTGK1 Stainless steel Gland plate	0 3 2 x M25 Threaded entries Gland plate
2 3 2 x ¾" Myers Hub, SSTGK2 Stainless steel Gland plate (Stainless Steel Control Stations only)	0 4 1 x M32 Plastic Cable gland
2 6 1 x ¾" Myers Hub, STGK2, Zone 1 Gland plate	2 7 1 x M25 Threaded Entry, Blanking plug and Gland plate
3 0 1 x ½" Myers Hub, STGK1, Zone 1 Gland plate	2 9 2 x M25 Threaded Entry, 1 blanking plug and Gland plate
3 1 1 x ½" Myers Hub, SSTGK1 Stainless st. Gland plate	3 3 1 x M20 Threaded entry Blanking plug and Gland plate
3 2 1 x ¾" Myers Hub, SSTGK2 Stainless st. Gland plate	3 4 1 x ¾" Myers Hub SSTGK2 stainless steel, Gland plate

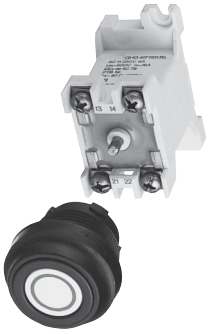
‡For a GHG43 control station with 316L stainless steel enclosure, add suffix "S860" to end of catalog number.
*Unoccupied spaces must be filled in with KLM for correct positioning of devices.

Crouse-Hinds by EATON

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	Ex de IIC T6
Certificate of Conformity	PTB No. Ex-87.B.1007U
Approvals	PTB, UL, cUL
Rated Voltage	Up to 400V
Rated Current	NEC/CEC 10A IEC 16 A
Terminal Wiring	2 x 2.5mm² / 14AWG
Mechanical and Electrical Life	>10⁵ Operations

See page 564 for explanation of contact symbols.

Pushbutton DRT

	A	B	C	D
Code	D R T O			

Contact System	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

Code D (leave blank if no lockout required)

Double Pushbutton DDTO

	A	B	C	D	E
Code	D D T O				

Contact System	12 22 / 11 21	14 24 / 13 23	14 22 / 13 21
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

Code E (leave blank if no lockout required)

Key-Operated Pushbutton SLT

	A	B	C
Code	S L T O		

Contact System	12 22 / 11 21	14 24 / 13 23	14 22 / 13 21
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**

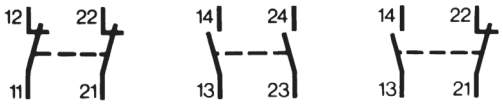
* 01 - Includes the following discs - Start, stop, I, O, and red, green, yellow, white and black blank discs.
† For Marking Guide for Pushbuttons see page 565.

Nonmetallic or 316L Stainless Steel Corrosion Resistant

Mushroom-Head Pushbutton SGT

Code	A	B	C	D	E	F
	S G T					

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 **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
- Accomodates 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 Up to 110VDC
Rated Current	Max. 15 mA
Power Consumption	<1.2W
Terminal Wiring	2 x 2.5mm² / 14AWG
Colors	Red, Green, Yellow, Clear & Blue

Signal Lamp SIL

Code	A	B	C
	S I L		

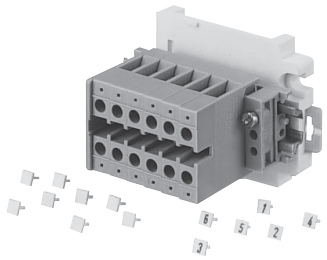
Colored Lens Cover	**White**	**Yellow**	**Red**	**1 pkg white, yellow, red, green**	**Green**	**Blue**
Code B	1	2	3	4	5	6
Voltage		**20-250VAC/DC**			**10-33VAC/DC**	
Code C		01			31	

Crouse-Hinds by EATON

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
Type of Protection	Ex e II T6
Certificate of Conformity	PTB No. Ex-87.B.2016U
Approvals	PTB, UL, cUL
Movement	Moving iron (core)
Accuracy	2.5% of range (class 2.5)
Measuring Range	0-16A direct, C.T. n/1 A
Operating Position	Vertical
Scale	Interchangeable for C.T. n/1 A
Zero Adjustment	At instrument
Terminal Wiring	2 x 2.5 mm² / 14 AWG
Rated Current Marking	Red indicator

Ammeter Measuring Instrument AM 72*

	M	7	2			
Code		**A**		**B**	**C**	

Movement	**Direct**	**n/1 A**	**0 - 2 mA**	**4-20 mA**
Code B	1	2	3	6

Movements 0-20 mA and 4-20 mA are only available with 0 - 100 / 120% scale

Direct Measurement		**Interchangeable Scale for C.T. n/1A**					
Code C	**Scale**	**Code C**	**Scale**	**Code C**	**Scale**	**Code C**	**Scale**
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

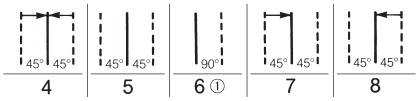
- Used for selectable operations (i.e. Hand–Off–Auto)
- 2 independent contacts
- Available in any contact configuration
- Spring return or maintained position
- Available with lockout positions

	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 Votage	400 V	Up to 500 V
Rated Current	NEC 10 A IEC 16 A	NEC 10 A IEC 16 A
Terminal Wiring	2 x 2.5mm² / 14 AWG	2 x 2.5mm² / 14 AWG
Mechanical Life	>10⁵ Operations	>10⁵ Operations
Electrical Life	>10⁵ Operations	>10⁵ Operations
Switching Capacity	AC II: 20V/6A 400V/4A DC II: 24V/6A 60V/0.8A 110V/.5A 220V/.2A	AC I: 500G/10A AC II: 230V/6A 500V/6A DC II: 24V/6A 48V/4A 60V/0.8A 110V/0.5A 220V/0.4A

Rotary Control Switch SCT

Code	S	C	T							
	A			B	C		D			

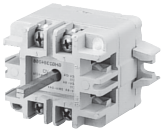
Switch Mechanism



4 5 6 ① 7 8

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*

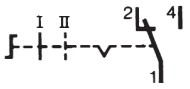
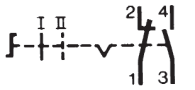
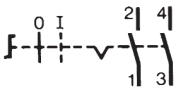
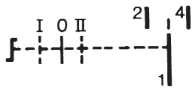
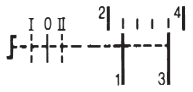
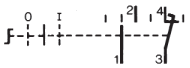
Code	E	x	2	3						
	A				B		C		D	E

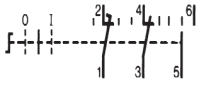
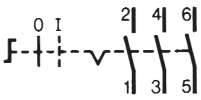
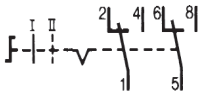
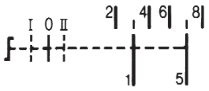
Code B	Inscription		
01	0	I	
03	STOP	START	
04	HAND	AUTO	
06	remote	local	
07	I	0	
13	LOCAL	REMOTE	AUTO
14	STOP	0	START
23	OFF	0	ON
24	HAND	OFF	AUTO
27	START	STOP	
29	OFF	ON	
32	ON	OFF	
99	Special – text to be given on order		

* Requires 2 spaces in cover.

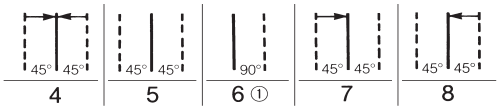
GHG43 Series Control Stations

Nonmetallic or 316L Stainless Steel Corrosion Resistant

Code C	Contact System	Type
00		2 Position
01		2 Position
02		2 Position
03		Single Pole Changeover
05		HOA
07		3 Position Single Level

Code C	Contact System	Type
09		3 Position
10		3 Position
12		3 Position
13		2 Position
14		2 Position
15		3 Position Double Pole Changeover

Switched Mechanism
Code D

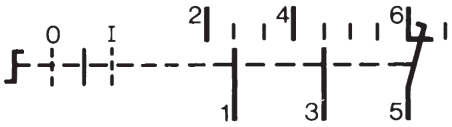


Padlocking Facility
Code E

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 (→←) 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.

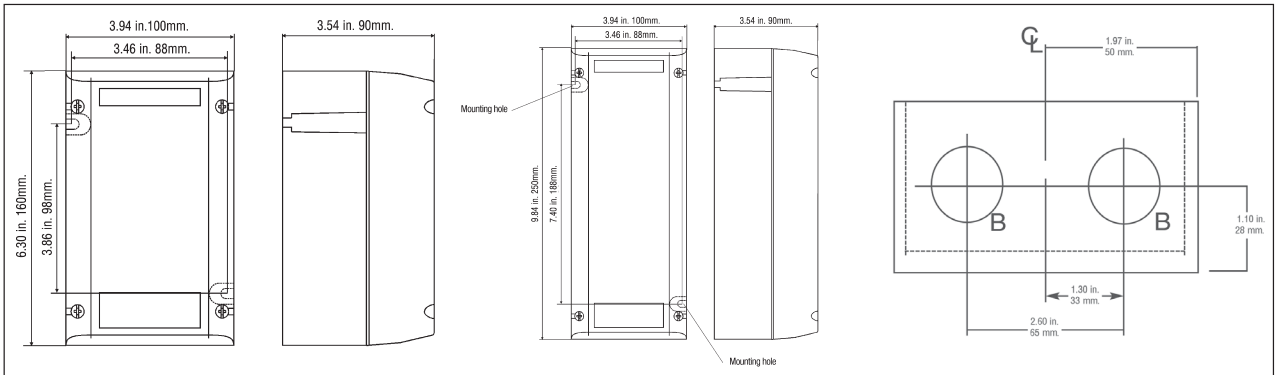
Marking Guide For Pushbuttons

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

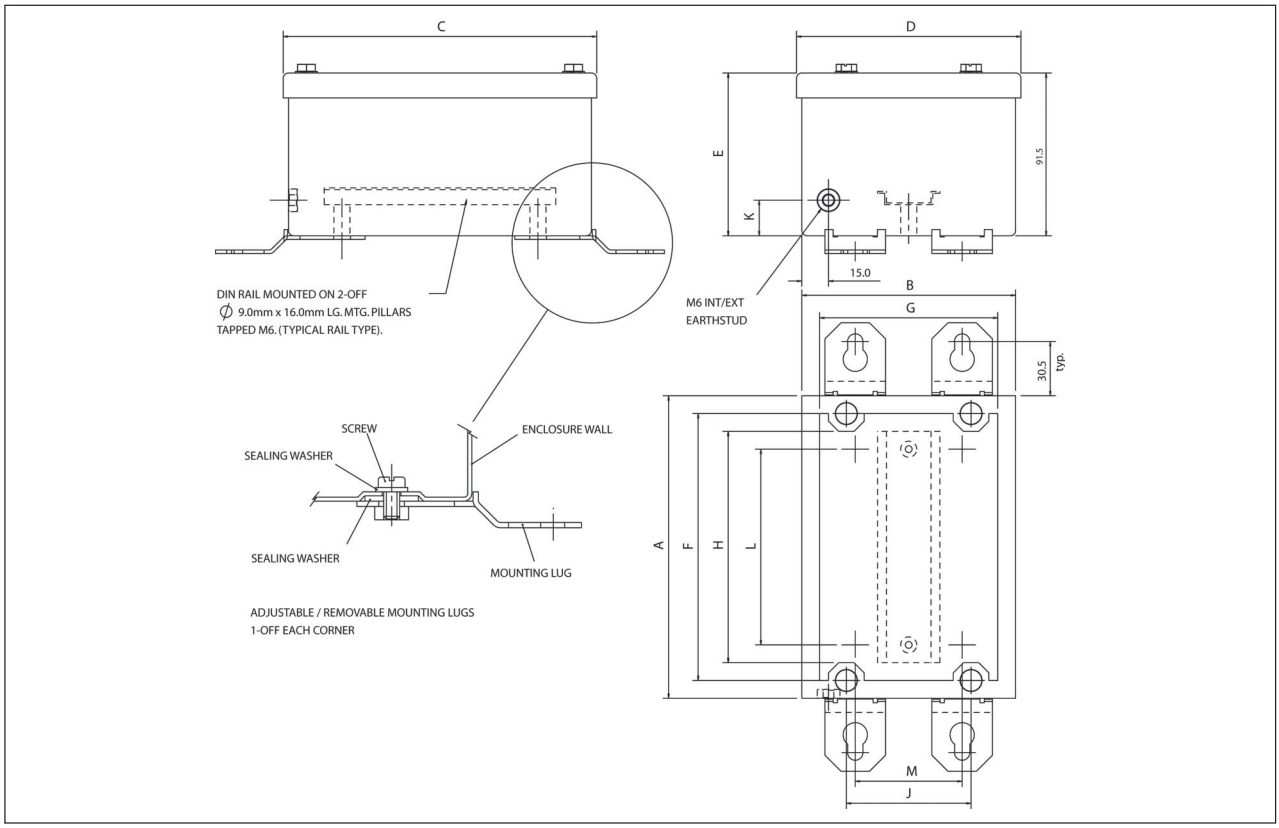
Nonmetallic or 316L Stainless Steel Corrosion Resistant

GHG43 Nonmetallic Control Stations



GHG43 Size 2 Nonmetallic | GHG43 Size 4 Nonmetallic | End View of Back Box

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

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 Compliances:

- 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

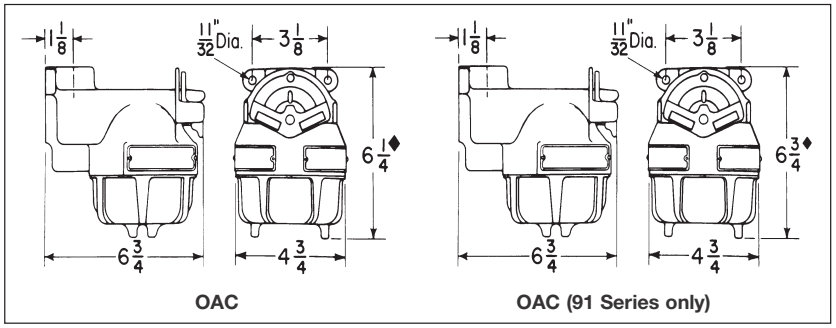
Options:

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

Description	Suffix
Back boss drilled and tapped for ¾" 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*:



OAC

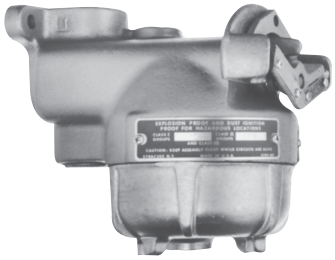
OAC (91 Series only)

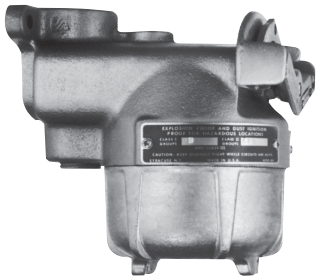
†Factory sealed for Class I, Div. 1 & 2, Groups B, C, D.
*Dimensions are approximate, not for construction purposes. For cover removal, add 2½" to dimension.

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	ED21	ED22	ED22	ED22*
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 — 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 - Selector Switches

Style	Position 1	Position 2	Position 3	Replacement Contact Blocks*	Enclosure with Selector Switch Hub Size	Enclosure with Selector Switch Cat. #
Two-Position, Two-Circuit	A1 A2			ED21	¾ 1	**OAC2471** ① **OAC3471** ①
Two-Position, Four-Circuit	A1 A2 B1 B2			ED22	¾ 1	**OAC2472** ① **OAC3472** ①
Three-Position, Two-Circuit ‡	A1 A2			ED21	¾ 1	**OAC2473** ① **OAC3473** ①
Three-Position, Four-Circuit ‡	A1 A2 B1 B2			ED22	¾ 1	**OAC2474** ① **OAC3474** ①
	A1 A2 B1 B2			ED22	¾ 1	**OAC2475** ① **OAC3475** ①

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.

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

Two-Position

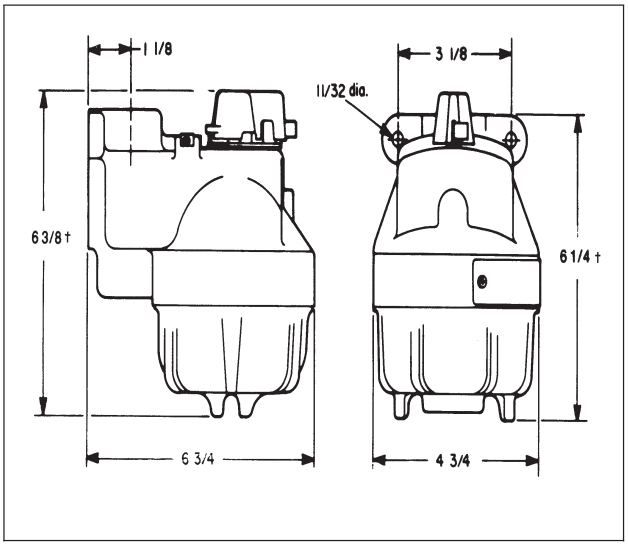
RUN, JOG	FAST, SLOW	IN-OUT
HAND, AUTOMATIC	OPEN, CLOSE	RAISE-LOWER
FORWARD, REVERSE	UP,DOWN	START-STOP
	ON, OFF	

Three-Position

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

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 2½" 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**

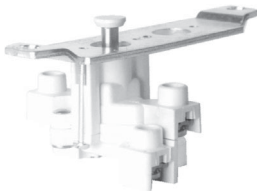
Custom covers can be supplied but must be accompanied by either a sample of the device to be covered or a copy of a drawing with all actual measurements of the device to be covered. Covers can also be color-coded. Consult factory.

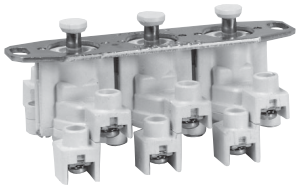
Replacements for Pushbutton and Selector Switch Control Stations

600 VAC Heavy Duty

ED Series Pushbutton Contacts (for control stations built in 1996 or earlier)

Complete with Mounting Strap and Hardware





Where Used	1 Circuit Universal	2 Circuits Universal	2 Circuits 1 Open - A 1 Closed - B	3 Circuits Universal
	Cat. #	Cat. #	Cat. #	
MC pushbutton stations and selector switches	**ED11**	**ED12†**	**ED12†**	-
OAC pushbutton stations and selector switches	**ED21**	**ED22†**	**ED22†**	-
EWC pushbutton stations	-	**ED32†**	**ED32†**	-
EMP selector switches	**ED38**	**ED35**	-	-
DSD962 pushbutton cover	-	-	-	**ED13**

FlexStation Series Pushbutton Contacts (for control stations built in 1997 or later)

Contact Block without Mounting Strap

Where Used	1 Circuit Universal	2 Circuits Universal	2 Circuits 1 Open - A 1 Closed - B	3 Circuits Universal
	Cat. #	Cat. #	Cat. #	
EDS and EFS pushbutton stations and selector switches	**ESWP126**	**ESWP126 (2)**	**ESWP126 (2)**	-
DSD962 pushbutton cover	-	-	-	**ESWP126 (3)**

Contact Ratings

Volts	Max. Current (Amperes) Make	Break	Voltamperes Make	Break	Continuous Current (Amperes)
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	Colors Available	Cat. #
MC, EFS, and EFD – current design with nylon guards	Red, Green, Black	**CF859 K1** ①
EMPS019, EMP019, EMPS029 and EMP029 – single operator FS, EFS, and EFD – previous design with aluminum guards	Red, Green, Black	**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.

5C XLC Explosionproof Lighting Contactors

Cl. I, Div. 1 & 2, Groups B, C, D
Cl. I, Zones 1 & 2
Cl. II, Div. 1, Groups E, F, G
Cl. II, Div. 2, Groups F, G
Cl. III

NEMA 3, 7BCD, 9EFG

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 ¾" 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_2

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

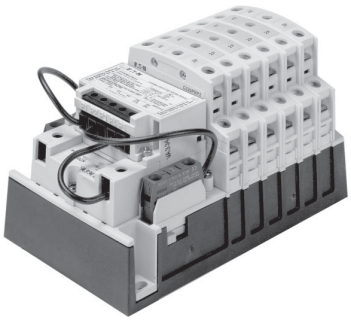
Options:

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

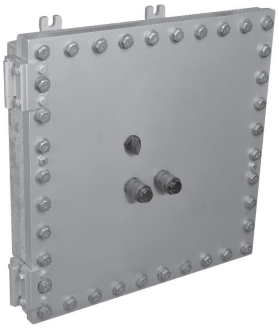
Ordering Information:

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.

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:

Base Catalog Number				Operators	Nameplates	Options
XLC	30	A	6	SXAB	39X0708	S752

Series
XLC

Amperage
30
60*
100*

Voltage
A - 120V
B - 208V*
C - 240V
D - 480V*
E - 600V*

Number of Poles

2	8
3	9
4	10
5	11
6	12
7	

Select one operator symbol for each of the four positions.
The first operator is in position 1, second operator in position 2, etc.
NOTE: If no operator is required, use the symbol X.

A - Pilot Light - Red (EMP009-J1)
B - Pilot Light - Green (EMP009-J3)
C - Pilot Light - Amber (EMP009-J6)
G - On/Off Single Pushbutton - Black (EMP019)
Q - On/Off 2-Position Switch (EMP049)
S - HOA 3-Position Switch (EMP069)
X - No Operator

Select one device nameplate symbol for each of the four positions.
The first nameplate is in position 1, second nameplate in position 2, etc.
NOTE: If no nameplate is required, use the symbol X.

05 - Start (DSL05)
06 - Stop (DSL06)
07 - On (DSL07)
08 - Off (DSL08)
17 - Emerg. Stop (DSL17)
29 - Hand Auto (DSL29)
39 - Hand Auto Off (DSL39)
65 - Start Stop (DSL65)
X - No Operator

Options

TB	Terminal Block**
TR	Timer**
PC1	EV2IH20 Photocell (120V)
PC2	EV2IH208 277 Photocell (208-277V)*
S752	Epoxy Finish (External)
S753	Epoxy Finish (Internal and External)
R11	Heater

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 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_2 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.

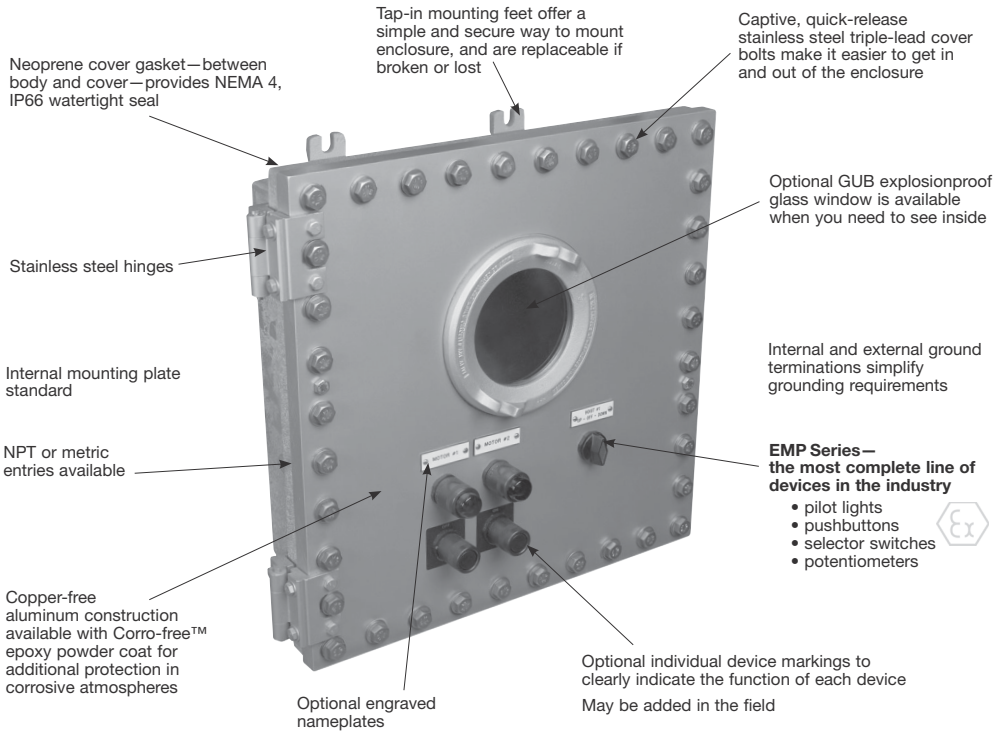
After filling out your separate order form for each panel, fax it to your local Eaton's Crouse-Hinds Distributor. Please consult the factory for alternatives not detailed in these pages, such as other conduit arrangements, terminal blocks, or circuit breaker operating handles.

Applications:

- Manufactured for hazardous environments, the EJB Custom-Built Control Panel is an explosionproof enclosure built to customer specific requirements
- Available in a variety of sizes with an unlimited combination of devices, windows, and markings, these panels are designed to maximize the efficiency of each unique process

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_2 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_2	Certificate #: ITS08ATEX15797U
• EMP Devices	
II 2 G Ex d IIB + H_2	Certificate #: ITS07ATEX15652U
• GUB0108 ATEX Window	
II 2 G Ex d IIB + H_2	Certificate #: ITS07ATEX15638U
• ECD Breather/Drain	
II 2 G Ex d IIB + H_2	Certificate #: ITS07ATEX15639U

Crouse-Hinds by EATON

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.

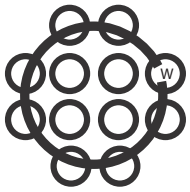
Total the number of device openings required based on the devices, openings and windows specified in Section 1.

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.

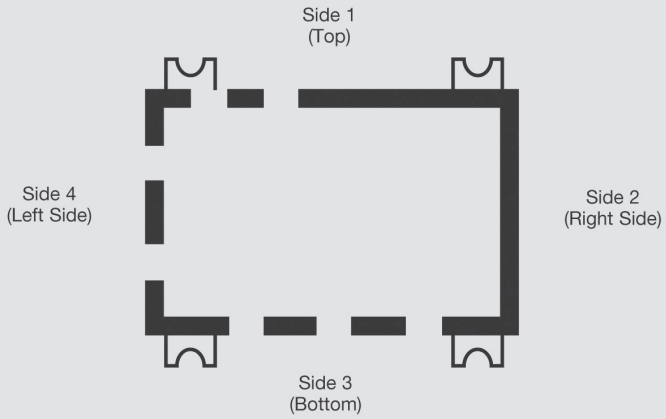
Example:

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.



Side 1:	**(2) 1" on the left side of the top**	**= 1CC00**
Side 2:	**No Openings**	**= No Symbols Required**
Side 3:	**(3) 2" on the bottom**	**= 3GGG**
Side 4:	**(2) 3/4" on the left side**	**= 4BB**

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.

Globally Certified—Individually Customized

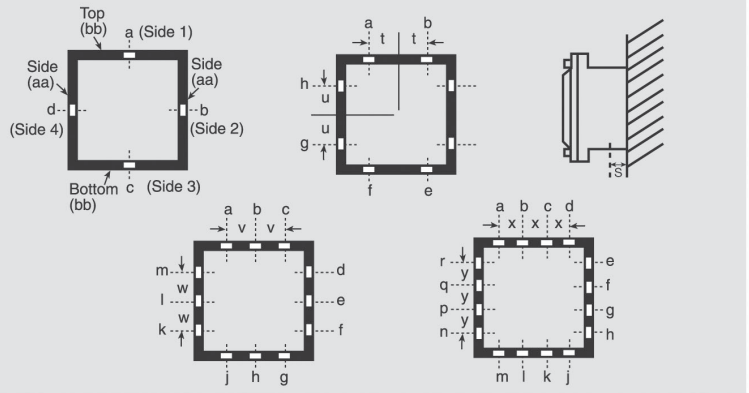
TABLE 2 CONDUIT ARRANGEMENTS

	Maximum Trade Size and Number of Openings								Spacing Dimensions						
	Top and Bottom (bb)				Sides (aa)										
CAT #	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	4-316
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.

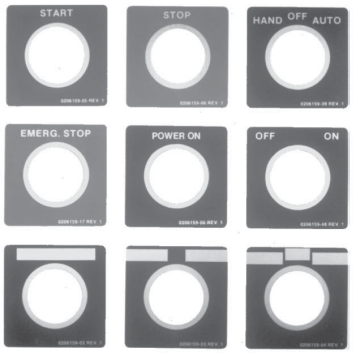
TABLE 5 LEGEND PLATE SELECTOR CHART

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	**For-Rev**	DSL30	Blank with 3 fields	DSL04
Blank with single field	DSL02	Hand-Auto	DSL29	Fast-Off-Slow	DSL41
Close	DSL21	In-Out	DSL35	**For-Off-Rev**	DSL40
Down	DSL23	**Off-On**	DSL48	**Hand-Off-Auto**	**DSL39**
Emerg. Stop	DSL17	**Open-Close**	DSL32	**Run-Off-Jog**	**DSL38**
Fast	DSL46	Raise-Lower	DSL36	**Open-Off-Close**	DSL43
Forward	DSL18	**Run-Jog**	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	**Up-Down**	DSL33		
On	DSL07				
Off	DSL08				
Open	DSL20				
Out	DSL25				
Power On	DSL14				
Raise	DSL26				
Reset	DSL12				
Reverse	DSL19				
Run	DSL09				
Safe	DSL85				
Slow	DSL47				
Start	DSL05				
Stop	DSL06				
Test	DSL13				
Trip	DSL11				
Up	DSL22				

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

Marking	Plate Color
Start	Green
Stop	Red
Emerg. Stop	Red



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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)	(120V)	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)	Up / Down	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	Position 1 / Position 2	Q	
EMP059	Position 1 / Position 2	R	

Selector Switches – Three position

	Diagram	Symbol	Quantity
EMP069 EMP069-S634 EMP069-S635	Position 1 / Position 2 / Position n 3	S S4 S5	
EMP079 EMP079-S634 EMP079-S635	Position 1 / Position 2 / Position 3	T T4 T5	
EMP089 EMP089-S634 EMP089-S635	Position 1 / Position 2 / Position 3	U U4 U5	

Selector Switches – Keyed Selector Switches

	Diagram	Symbol	Qty
EMP0491 EMP0492 EMP0493	Position 1 / Position 2	Q6 Q7 Q8	
EMP0591 EMP0592 EMP0593		R6 R7 R8	
EMP0691 EMP0692 EMP0693 EMP0694	Position 1 / Position 2 / Position 3	S6 S7 S8 S9	
EMP0791 EMP0792 EMP0793 EMP0794		T6 T7 T8 T9	
EMP0891 EMP0892 EMP0893 EMP0894		U6 U7 U8 U9	

Total Number of all Devices on this page _____

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)		
	Symbol	Quantity
3/4" - 14 NPSM Opening (plugged)	V	_____

Windows			
	Symbol	Quantity	# of Openings
GUB0108	W	_____	_____

Total Number of all Device Openings from previous page _____

Total Number of all Devices / Openings from Section 1 _____

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Distributor:	**Contact:**
Customer:	**Phone Number:**

EATON'S CROUSE-HINDS FACTORY USE ONLY

Catalog Number Entered:	
Reference #:	**B#**

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

OPTIONS

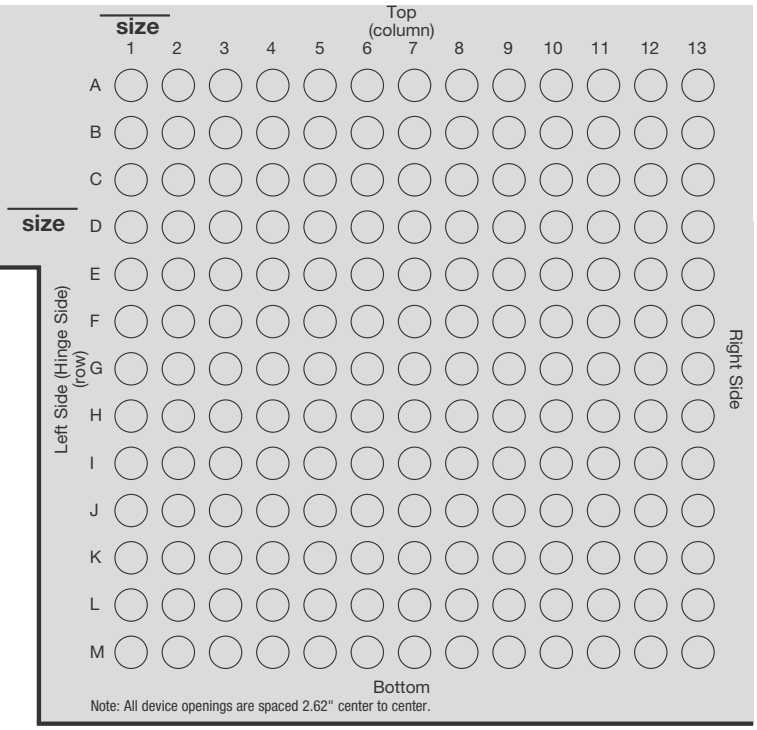
For any of the following options, check here:

____ ATEX Certified (ATEX)
____ Breather and Drain (S756V)
____ Epoxy finish, external (S752)
____ Epoxy finish, internal and external (S753)

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.



Note: All device openings are spaced 2.62" center to center.

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 Row	Column	Device Marking (DSL) or Engraved Plate Line 1	Engraved Plate Line 2	Marking Size

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_2, 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/EEMAC: 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

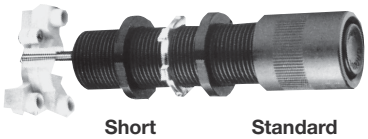


Diagram	Short Cat. #	Standard Cat. #
	EMPS019 ②	**EMP019** ②
	EMPS029 ②	**EMP029** ②

Double pushbutton, double operator

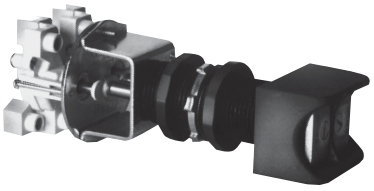


Diagram	Short Assembly Cat. #	Standard Assembly Cat. #
	EMPS039 ②	**EMP039** ②

Two-position selector switch

Diagram Position 1	Position 2	Short Assembly Cat. #	Standard Assembly Cat. #
A1 A2	A1 A2	**EMPS049** ②	**EMP049** ②
A1 B1 A2 B2	A1 B1 A2 B2	**EMPS059** ②	**EMP059** ②

Three-position selector switch

Diagram Position 1	Position 2	Position 3	Short Assembly Cat. #	Standard Assembly ✠ Cat. #
A1 A2	A1 A2	A1 A2	**EMPS069** ②	**EMP069** ②
A1 B1 A2 B2	A1 B1 A2 B2	A1 B1 A2 B2	**EMPS079** ②	**EMP079** ②
A1 B1 A2 B2	A1 B1 A2 B2	A1 B1 A2 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.

Group 2: For custom-built control panels.

Illuminated pushbutton‡

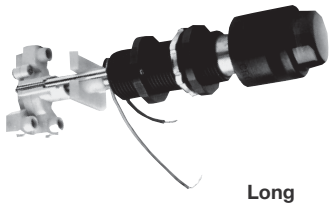
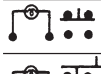
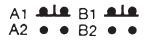
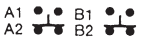
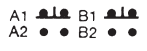
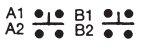
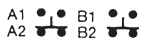
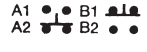
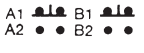
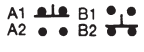


Diagram		Long Assembly Cat. #
	120V pilot light	**EMP0090** ①
	120V pilot light	**EMP0098** ①

Two-position selector switch, key operated

Diagram		Key Removal	Short Assembly Cat. #	Standard Assembly Cat. #
Position 1	Position 2			
		Both positions	**EMPS0491** ②	**EMP0491** ②
		Left only	**EMPS0492** ②	**EMP0492** ②
		Right only	**EMPS0493** ②	**EMP0493** ②
		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			
			All	**EMPS0691** ②	**EMP0691** ②
			Center only	**EMPS0692** ②	**EMP0692** ②
			Left only	**EMPS0693** ②	**EMP0693** ②
			Right only	**EMPS0694** ②	**EMP0694** ②
			All	**EMPS0791** ②	**EMP0791** ②
			Center only	**EMPS0792** ②	**EMP0792** ②
			Left only	**EMPS0793** ②	**EMP0793** ②
			Right only	**EMPS0794** ②	**EMP0794** ②
			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.

Maintained Contact Pushbutton

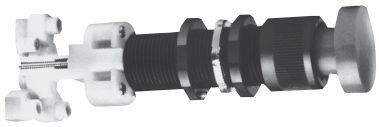


Diagram		Long Assembly Cat. #
Up	Down	
		**EMP098** ②

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

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

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

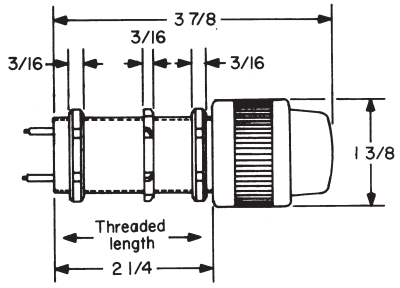
Push Button Station Marking

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

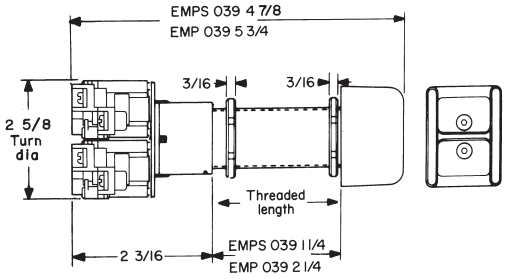
5C EMP and EMPS Barrel Assemblies

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_2, T5	NEMA 3, 7BCD, 9EFG

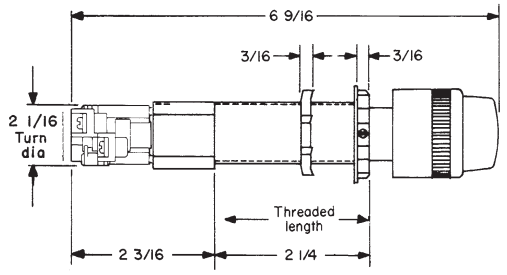
Dimensions*
In Inches:



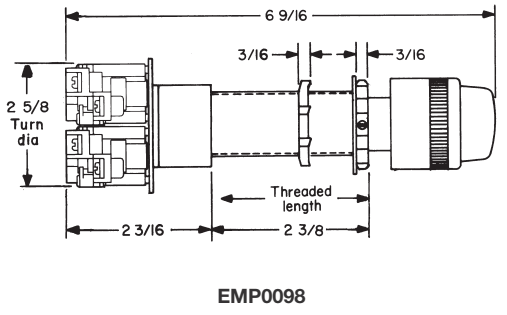
EMP009



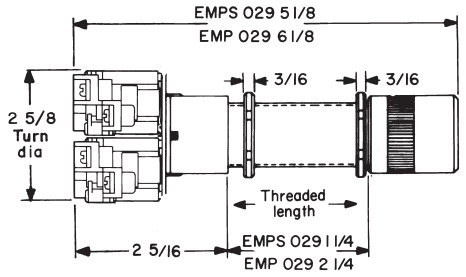
EMP-EMPS039



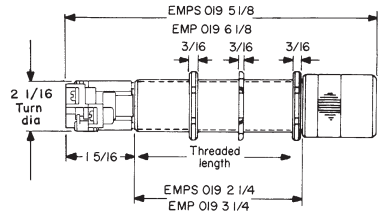
EMP0090



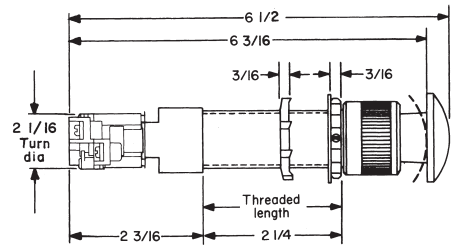
EMP0098



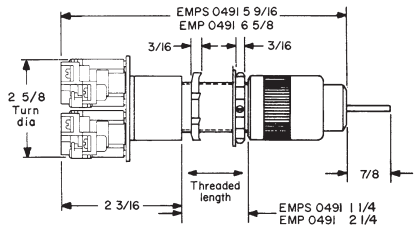
EMP-EMPS029



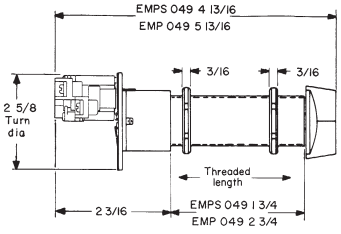
EMP-EMPS019



EMP098



EMP-EMPS0491, 0591, 0691, 0791, 0891 Series



EMP-EMPS049, 059, 069, 079, 089

*Dimensions are approximate, not for construction purposes.

All barrel assemblies are ¾"-14 NPSM thread size.

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_2
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

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 II, Division 1, Groups E, F, G
- Class II, Division 2, Groups F, G
- Class III
- Class I, Zone 1&2 IIB + H_2
- 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	Catalog Number
Indicator with two pilot lights*	**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:

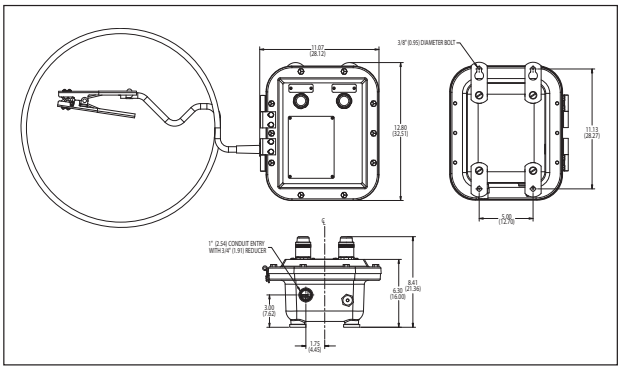
Ground clamp	**EGL-K1**
Ground clamp assembly (includes 25 ft. cord, connector and clamp)	**EGL:20109-B**
EGL210 universal interior replacement kit	**EGL210-R1**
Pilot lights (Red)	**EMP009-J1-LED**
Pilot lights (Green)	**EMP009-J3-LED**
Mounting feet	**EJB-KIT5**
Transformer (220/240VAC; 440/480VAC)	**EGL S883 KIT**
Space heater	**EGL R11 KIT**
Pilot light plug kit	**EGL PLUG KIT**

Weight & Dimensions:

EGL Assembly:

Weight = 32 lbs (14.5 kg)

Dimensions = inches (centimeters)



5C 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:

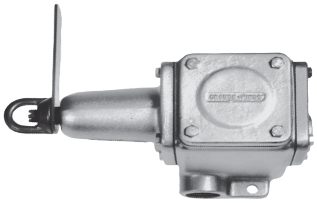
- *Feraloy* iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized with chromate finish (red acrylic paint on indicating arm)
- Bronze – natural

Options:

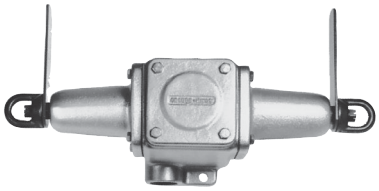
Description	Suffix
Finish: *Corro-free*™ epoxy powder coat – for coating outside only.	**S752**

Electrical Rating:

- Control circuit switch – 15 AMP, 600 VAC max.



AFU0333-50 Single end left



AFU0333-66 Double end

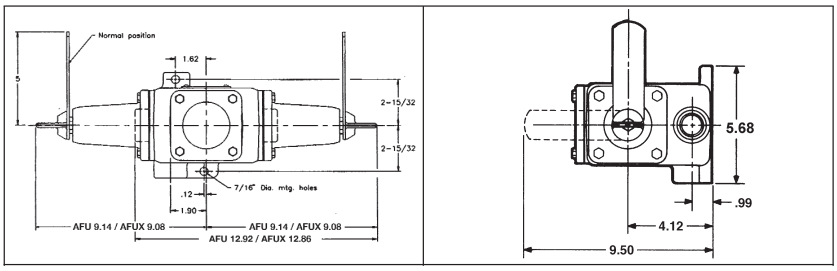
Ordering Information

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 EATON

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

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 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

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

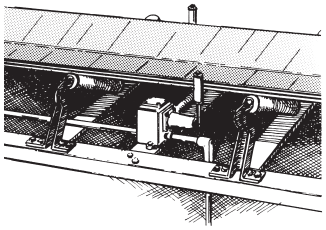
Standard Materials:

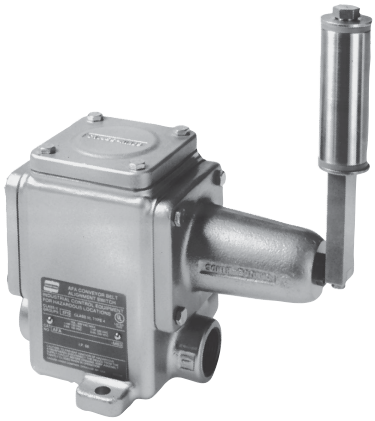
- Enclosure – *Feraloy*® iron alloy
- Bearing and operating arm – stainless steel with plastic end caps

Standard Finishes:

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

Typical AFA Switch Application

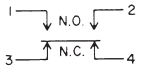
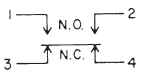




Electrical Rating:

- Control circuit switches – 15 AMP, 600 VAC max.

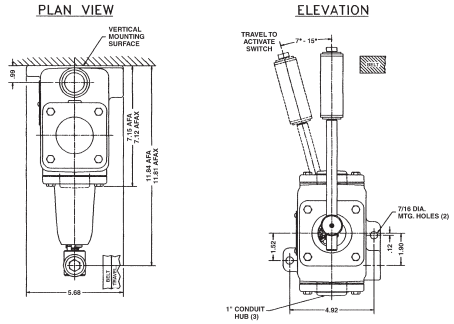
Ordering Information

Contact Arrangement	Diagram	Cat. #
2 normally open		**AFA20**
2 normally closed		**AFAX20**

Options:

Description	Suffix
Finish: *Corro-free*™ epoxy powder coat – for coating outside only.	**S752**

Dimensions
In Inches*:



*Dimensions are approximate, not for construction purposes.

5C AFU Mine Signal Switches

NEMA 3
Raintight
Wet Locations

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

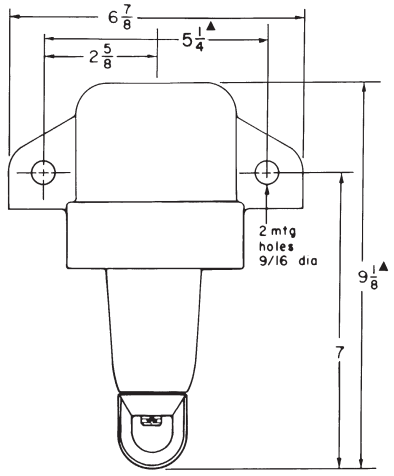
AFU mine signal switch with pushbutton switch (cover removed)

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*:



*Dimensions are approximate, not for construction purposes.

Crouse-Hinds by EATON

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

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

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

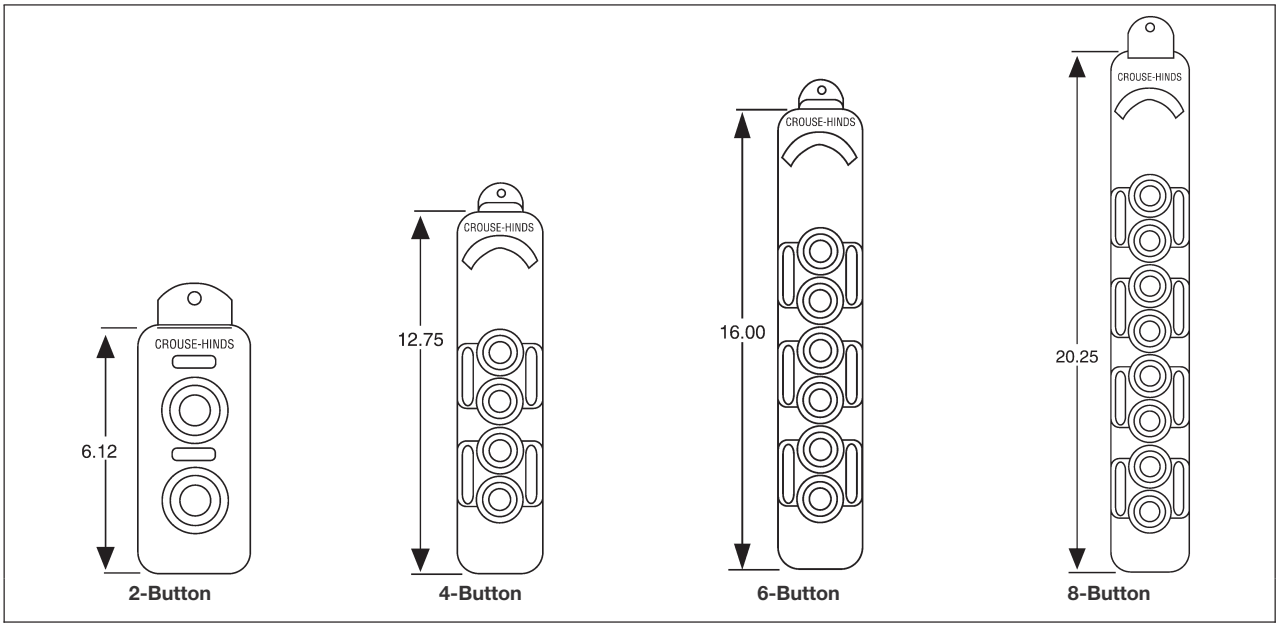
Cat. #	Description	Cat. #	Description
314850 1	Bridge	**314850 6**	Fwd/Rev North/South
314850 2	Trolley	**314850 9**	On/Off Start/Stop
314850 3	Hoist		
314850 4	In/Out Up/Down		
314850 5	Right/Left East/West		

Replacement Switch

Description	Cat. #
Replacement Switch	**ESWP126**

Dimensions

In Inches:



Crouse-Hinds by EATON

FLEXITITE™ Attachable Pendant Pushbutton Stations

NEMA 3, 4X, 5, 6, 12

Raintight
Watertight
Dust-tight
Wet Locations

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.

Certifications and Compliances:

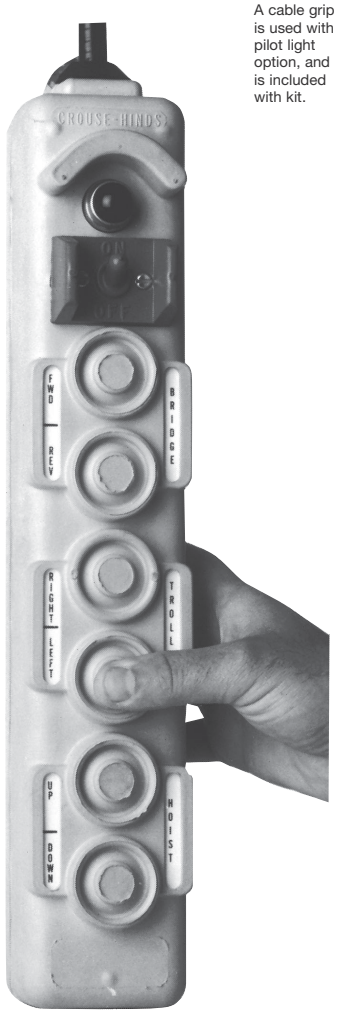
- NEMA: 3, 4X, 5, 6, 12
- UL Standard: 508
- CSA Approved

Standard Materials:

- Body and cover – steel reinforced neoprene
- Strain relief and reinforcement plates – stainless steel
- Exterior hardware – stainless steel

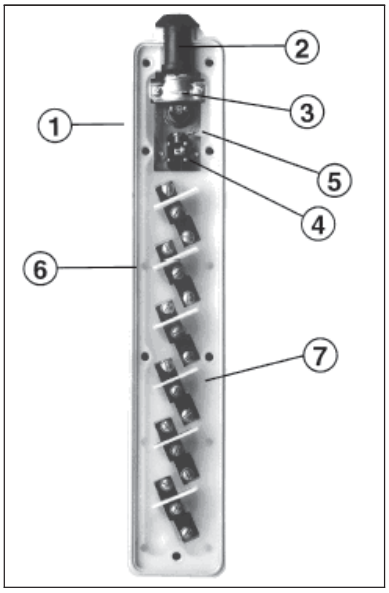
Standard Finishes:

- Neoprene – safety yellow
- Steel – stainless steel



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.

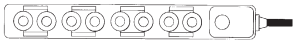
RAISED BUMPER – protects lens against damage caused by impact.

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 20A 460V 2 hp. 230V	2 Speed 10A 230V ½ hp. 230V	DC 10A 125V ⅛ hp. 125V	Cable Diameter	Shipping Weight (lbs.)	Dimensions Length	Width	Depth
2-Button									
	**None**	**X8635 21**	**X8635 22**	**X8635 20**	.555 thru .665	2½	8¾"	2¼"	3"
4-Button									
	**3316317**	**X8635 41B**	**X8635 42B**	**X8635 40B**	.505 thru .730	3	13½"	3"	3⅝"
6-Button									
	**3316317**	**X8635 61B**	**X8635 62B**	**X8635 60B**	.590 thru .840	6½	17"	3"	3⅝"
8-Button									
	**3316317**	**X8635 81**	**X8635 82§**	**X8635 80**	.698 thru .968	9	21½"	3"	3 7/16"

*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

	Cable Diameter			
	4 and 6 Button			8 Button
Lamp Voltage	.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 Yellow 	Momentary Switch	240 AC	7.5	0.75
		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

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 9**	Raise/Lower
315116 4	Off/In	**315116 10**	Up/Down
315116 5	On/Out	**315116 11**	Right/Left
315116 6	Fwd/Right		

4, 6 and 8-Button

Cat. #	Description	Cat. #	Description
314850 1	Bridge	**314850 6**	Fwd/Rev. (North/South)
314850 2	Trolley	**314850 9**	On/Off (Start/Stop)
314850 3	Hoist	**314850 12**	Raise/Lower
314850 4	In/Out (Up/Down)	**314850 13**	Inbd/Outbd
314850 5	Right/Left (East/West)	**314850 14**	Off/On

Shoulder Bolts for Fastening Front to Back Cover – 2-Button (P/N 1316311-2); 4- & 6-Button (P/N 1316311-1); 8 button (P/N 1316311-3).
NOTE: Refer to price list for identification of stock items.

Replacement Parts

	Cat. #		Switch Element Part Numbers								
Style	Front Cover	Back Cover	Toggle Switch Kit†	1 Speed 20A, 460V 2hp, 230V	2 speed 10A, 230V ½ hp. 230V	DC 10A, 125V ⅛ hp. 125V	Toggle Off/On Element	Barrier	Separator	Parts Kit‡	Pilot Light Kit
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.

Crouse-Hinds by EATON

EGF Series
Ground Fault Control Station

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:

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.
- 1¼" throughfeed conduit hubs with 1¼"–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)

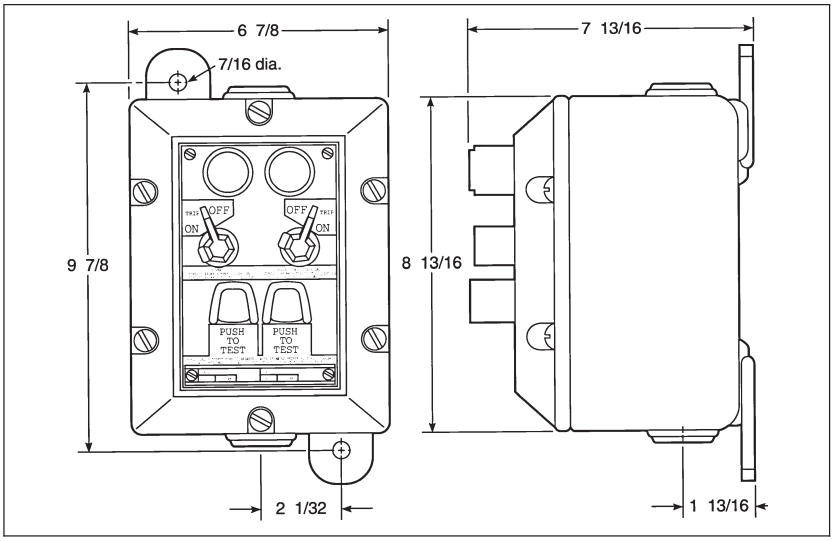
Ordering Information

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:



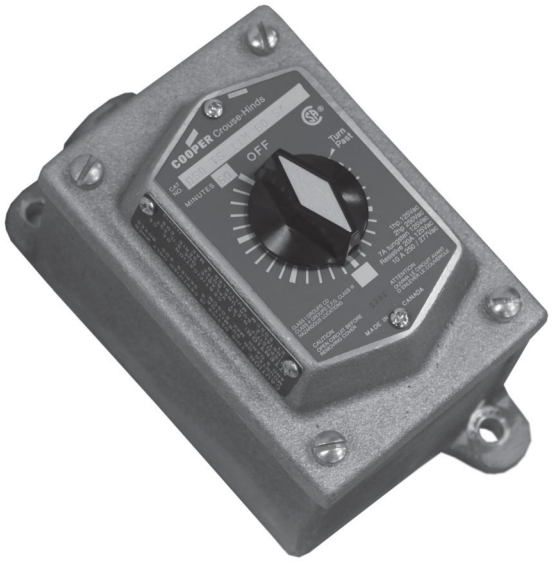
DSD-TS Series Timers

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

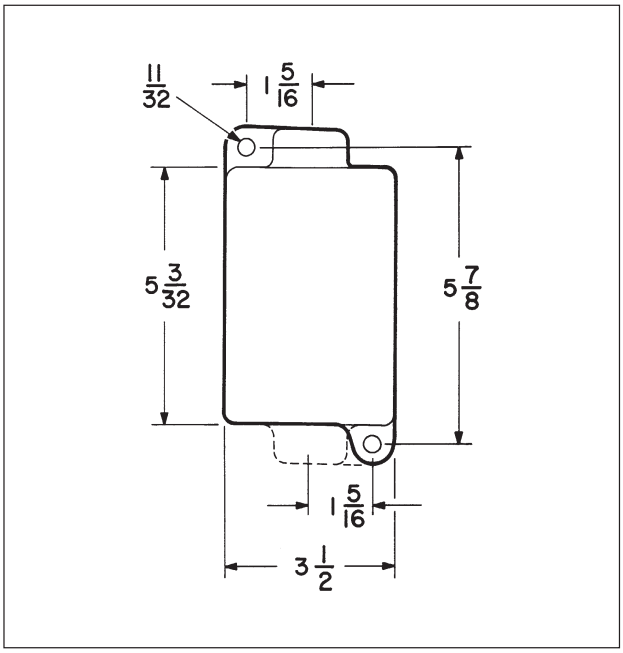
Poles:
11 - SPST
12 - SPDT
21 - DPST

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.

ACE10 Series Explosionproof Variable Frequency 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

Utilizes ABB ACS850 Series Drives

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

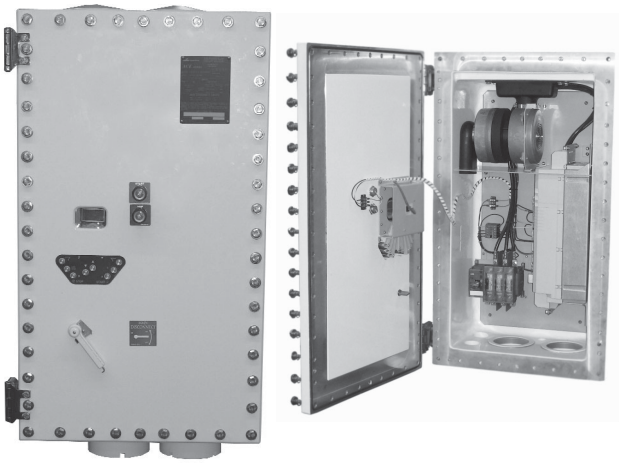
Reduce Operation and Installation Costs

- 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.



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

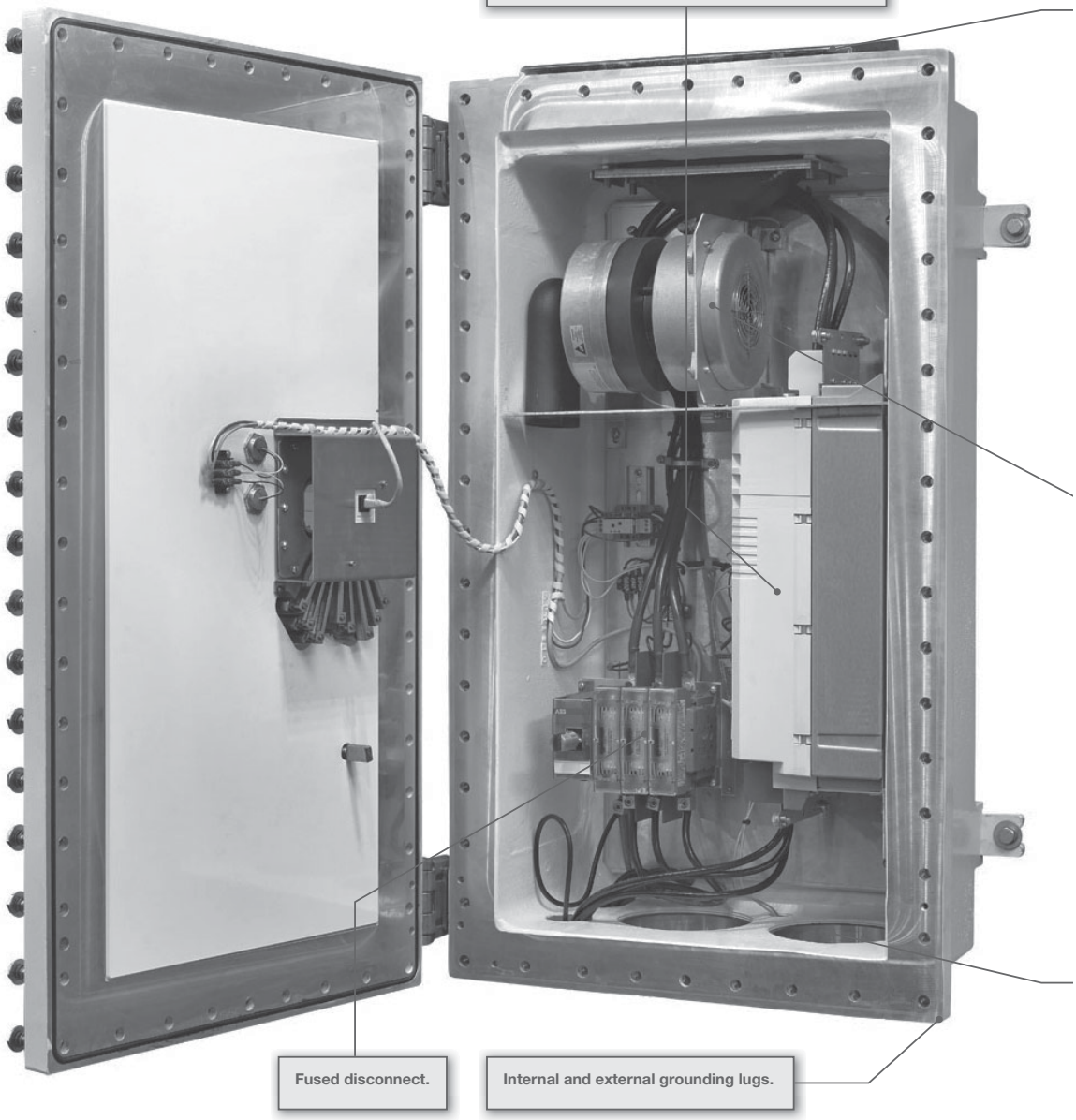
ACE10 Series Explosionproof Variable Frequency Drives

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

System Design



*5HP and below listed for Group B.

Utilizes ABB ACS850 Series Drives

Shroud† covering top filters maintains NEMA 4X rating.

Stainless steel, captive, triple lead quick release spring loaded bolts install faster and provide clear indication that the cover bolts are fully retracted from the body.

Stainless steel hinges provide convenient and easy access to enclosure interior.

Explosionproof window allows for viewing of the VFD interface module LCD screen.

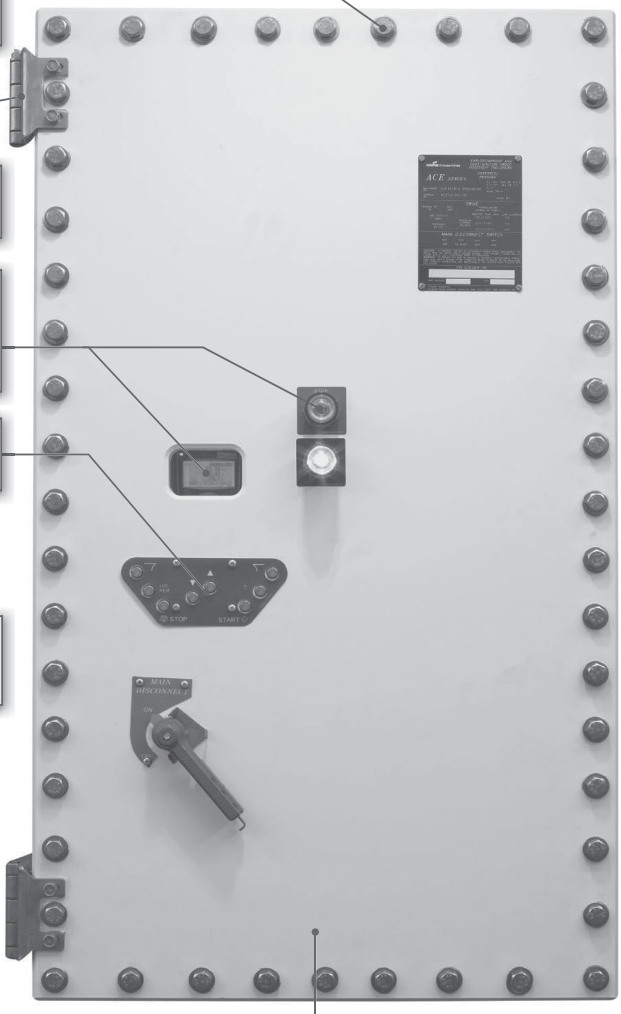
Explosionproof pilot lights provide run, stop, and alarm indication.

Explosionproof keypad allows operation of VFD interface module without opening the enclosure door.

Heavy duty blower† creates airflow through the enclosure, allowing VFD to operate in ambient temperatures up to 50°C.

Filters† in top and bottom of enclosure allow airflow into and out of the enclosure, cooling the VFD and eliminating risk of overheating.

Pre-filter screens† (not shown) eliminate clogging of the primary filters, ensuring reliable and consistent airflow. Pre-filter screens can be easily removed and cleaned without shutting down operations.



Enclosure epoxy painted for superior corrosion resistance.

†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.

6C ACE10 Series Explosionproof Variable Frequency 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

Utilizes ABB ACS850 Series Drives

Ordering Information:

Step 1 – Select VFD Horsepower Rating

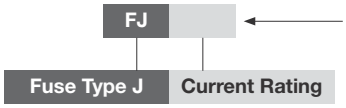
Cat. #	Nominal Horsepower (KW)	Max. Disconnect Rating (Amps)	Disconnect Fuse Type	Enclosure Size	Input Rating (Amps)	Max. Output Rating (Amps)†	Power Loss (Watts)‡	Temp. Rating
ACE10 1	1.5 (1.1)	30	J	1	2.3	3.0	106	T6
ACE10 2	2.0 (1.5)		J	1	3.1	3.6	112	T6
ACE10 3	3.0 (2.2)		J	1	4.0	4.8	132	T6
ACE10 5	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

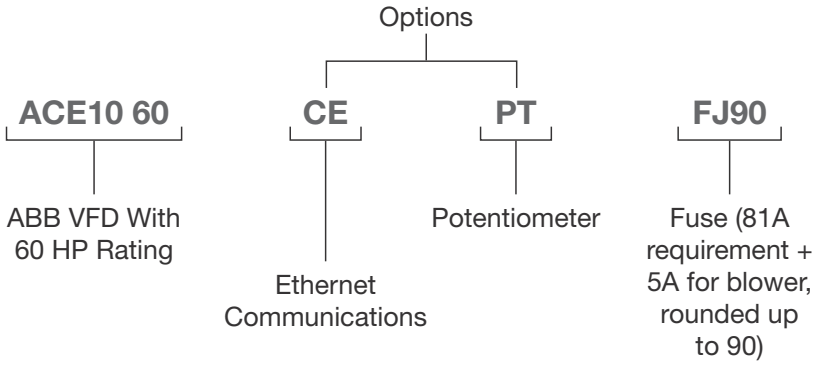
Description	add suffix
Communication Modules	
Profibus	**CP**
Devicenet	**CD**
CAN Open	**CC**
Modbus	**CM**
Ethernet	**CE**
Potentiometer in Cover	
AB 800H	**PT**

Step 3 – Add Current Rating for Eaton's Bussmann Fuses



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:



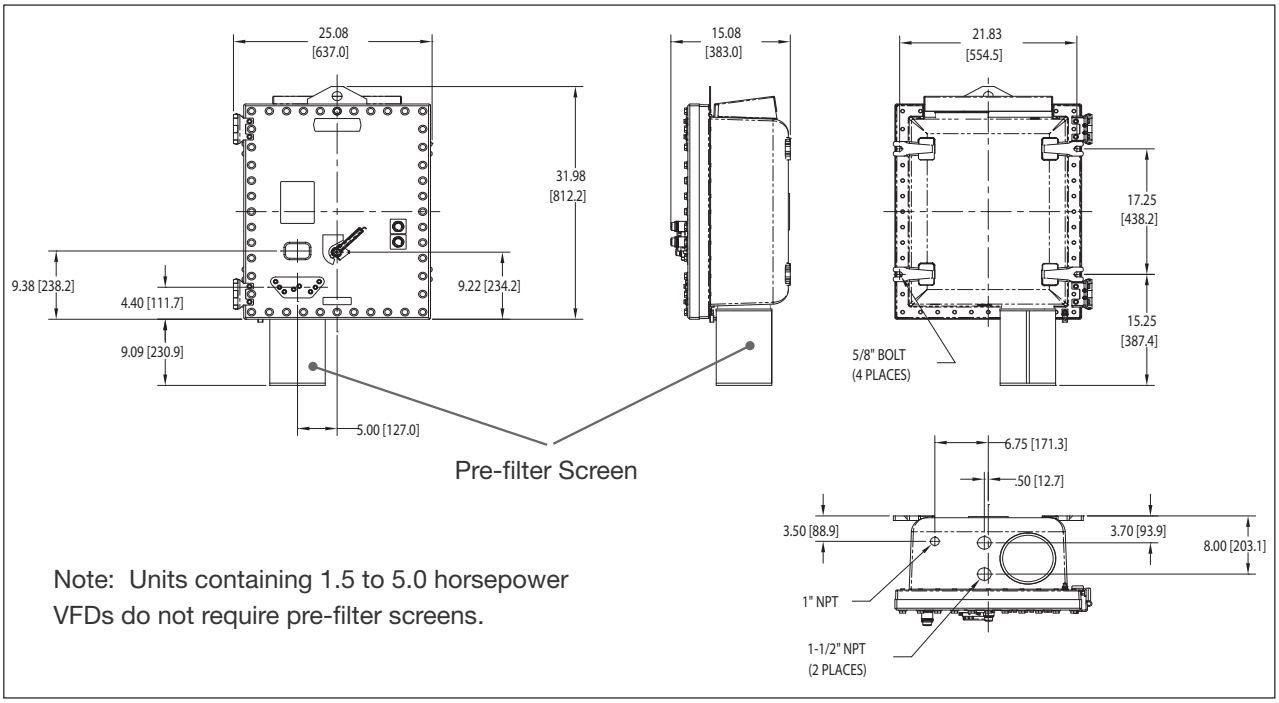
ACE Series Recommended Distributor Stock List:

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**
Pushbutton operator, finger, and hardware (1 pc.)	**ACE KIT 4**
Temperature controller (1 pc.)	**ACE KIT 5**

*5HP and below listed for Group B.

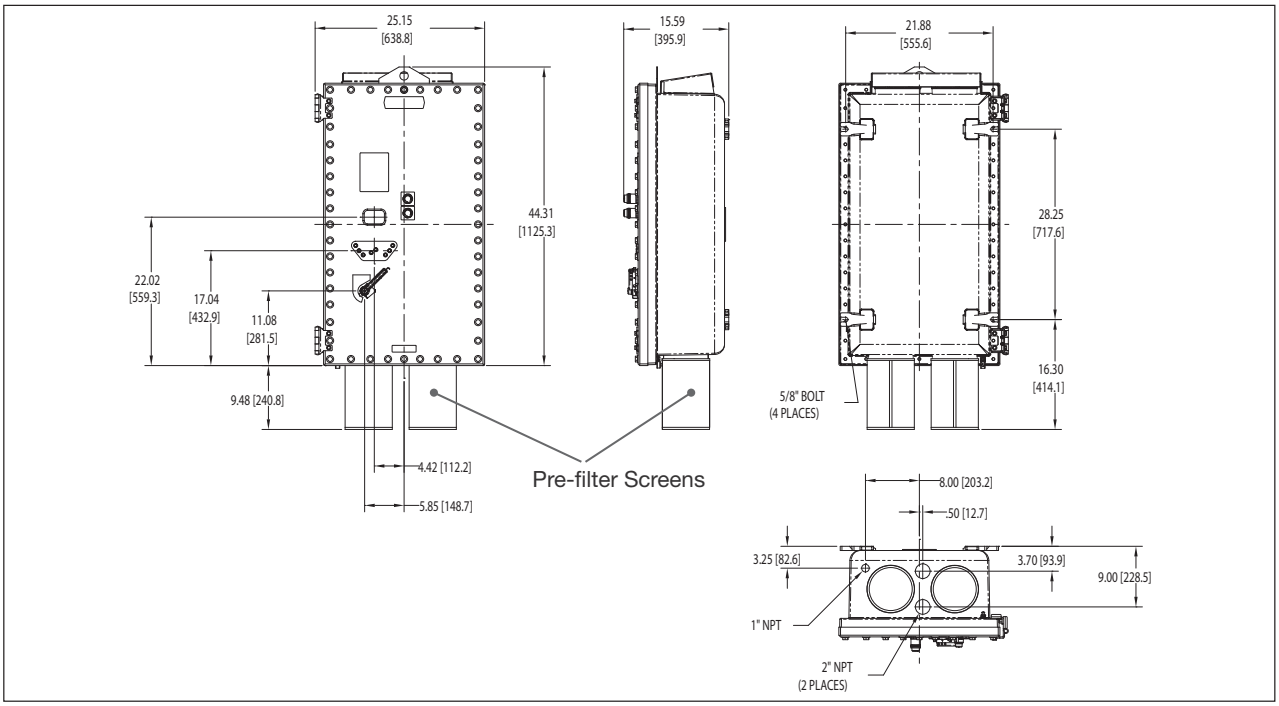
Dimensions

In Inches:



Note: Units containing 1.5 to 5.0 horsepower VFDs do not require pre-filter screens.

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.

ACE20 Series Explosionproof Variable Frequency 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

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

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

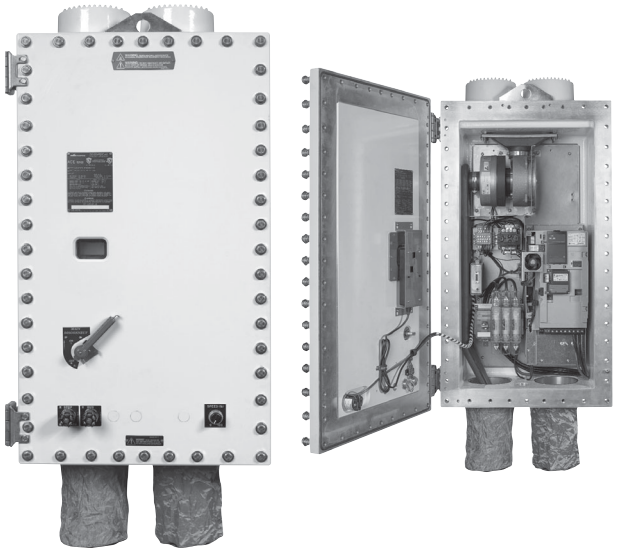
Reduce Operation and Maintenance Costs

- 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:

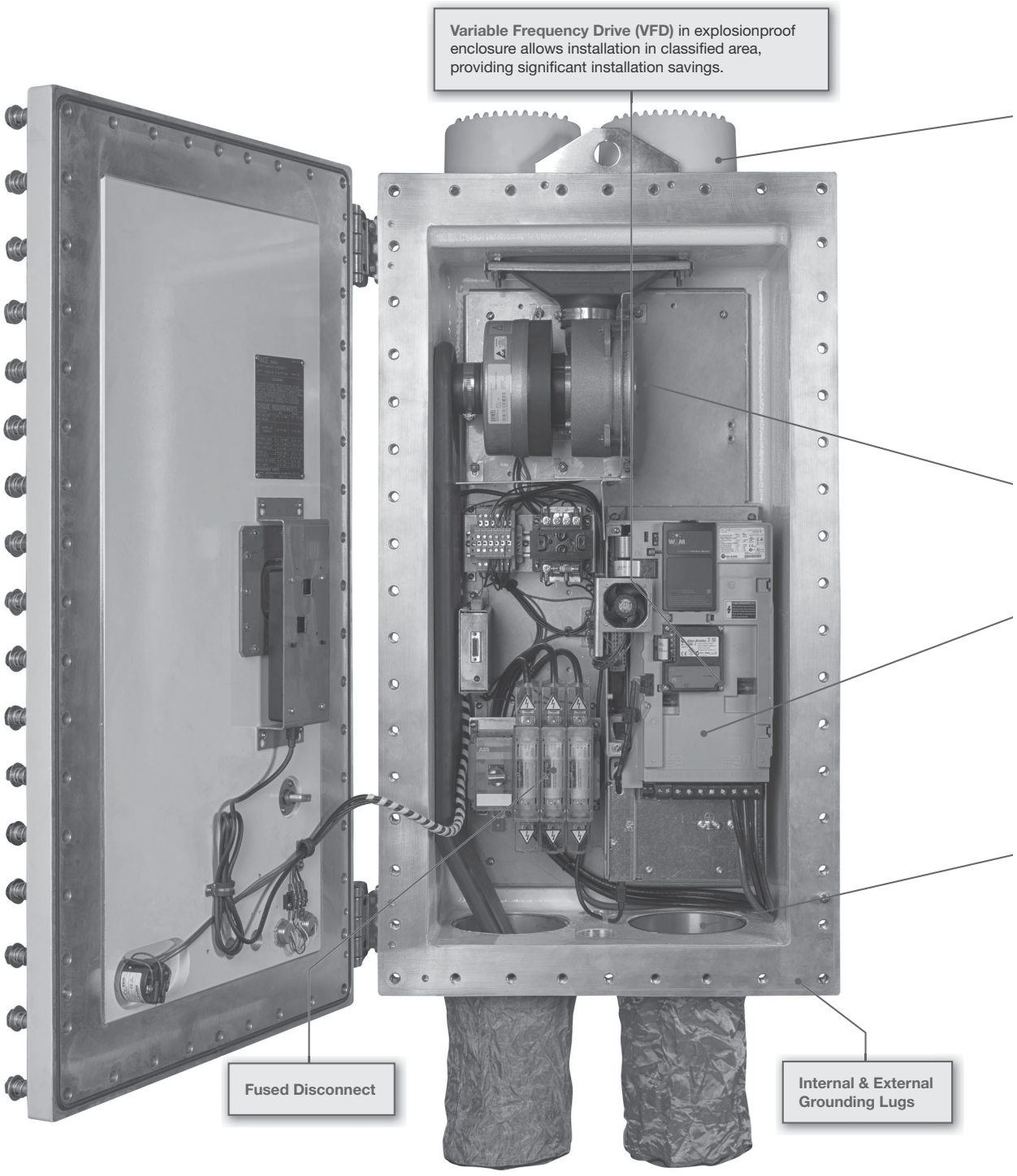
- Allen-Bradley® PowerFlex 700® Series low voltage, compact AC drives

ACE20 Series Explosionproof Variable Frequency 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

Utilizes Allen-Bradley® PowerFlex 700® Series Drives



*5HP and below listed for Group B.

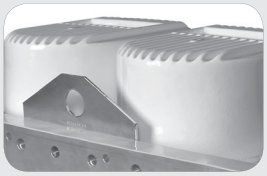
ACE20 Series Explosionproof Variable Frequency Drives

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

Cl. I, Div. 1 & 2, Groups B, C, D (UL)
Cl. I, Div. 1 & 2, Groups B*, C, D (cUL)

NEMA 3, 4X, 7BCD
Raintight
Wet locations

Shroud* covering top filters maintains NEMA 4X rating.



Stainless steel, captive, triple lead quick release spring loaded bolts install faster and provide clear indication that the cover bolts are fully retracted from the body.

Stainless steel hinges provide convenient and easy access to enclosure interior.

Explosionproof window allows for viewing of the VFD interface module LCD screen.

Heavy duty blower* creates airflow through the enclosure, allowing VFD to operate in ambient temperatures up to 50ºC.

Wireless Interface Module Option

Filters*
in top and bottom of enclosure allow airflow into and out of the enclosure, cooling the VFD and eliminating risk of overheating.

Pre-filter screens*
eliminate clogging of the primary filters, ensuring reliable and consistent airflow. Pre-filter screens can be easily removed and cleaned without shutting down operations.

** Heavy duty blower, shroud, filters, and pre-filter screens not included with units containing 1.5 to 5.0 horsepower VFDs.*

Explosionproof pilot lights provide run, stop and fault indication.

Optional potentiometer, push-buttons and selector switches

Enclosure epoxy painted for superior corrosion resistance.

*5HP and below listed for Group B.

ACE20 Series Explosionproof Variable Frequency 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

Utilizes Allen-Bradley® PowerFlex 700® Series Drives

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	20BD027A0AYNANC0
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	2	9.5	11.0	594	T4A	20BD027A0AYNANC0
ACE20 10	10				12.5	14.0	618	T4A	
ACE20 15	15	60	J		19.9	22.0	726	T4A	
ACE20 20	20				24.8	27.0	794	T4A	
ACE20 25	25				31.2	34.0	841	T4A	20BD065A0AYNANC0
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	

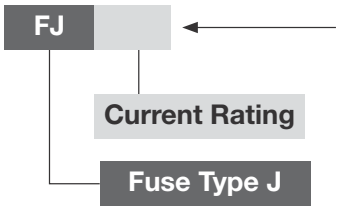
Above data is for a 480V drive. For 600V drive, please consult factory.
†De-rating may be required to account for specific environmental conditions (high ambient temperature, altitude, etc.). Consult factory for de-rating information.
††When not installed in a well ventilated environment, provisions must be made to account for heat generation to ensure proper operation of the device.

Step 2 – Add Desired Options

Description	Add Suffix
Communication Modules	
Profibus	**CP**
Devicenet	**CD**
CAN Open	**CC**
Modbus	**CM**
Ethernet	**CE**
Wireless	**WL**
Options	
Potentiometer	**PT**
Hand-Off-Auto Switch‡	**RR3**
Pushbutton Start-Stop‡	**PB23**
600 VAC VFD	**Consult Factory**

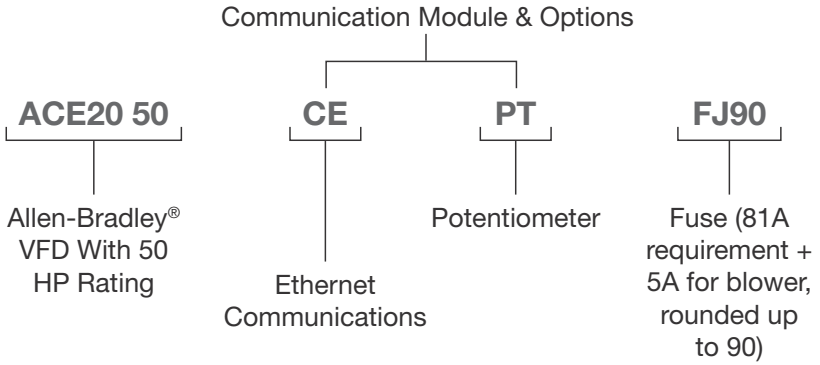
‡RR3 and PB23 cannot be ordered together.

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:

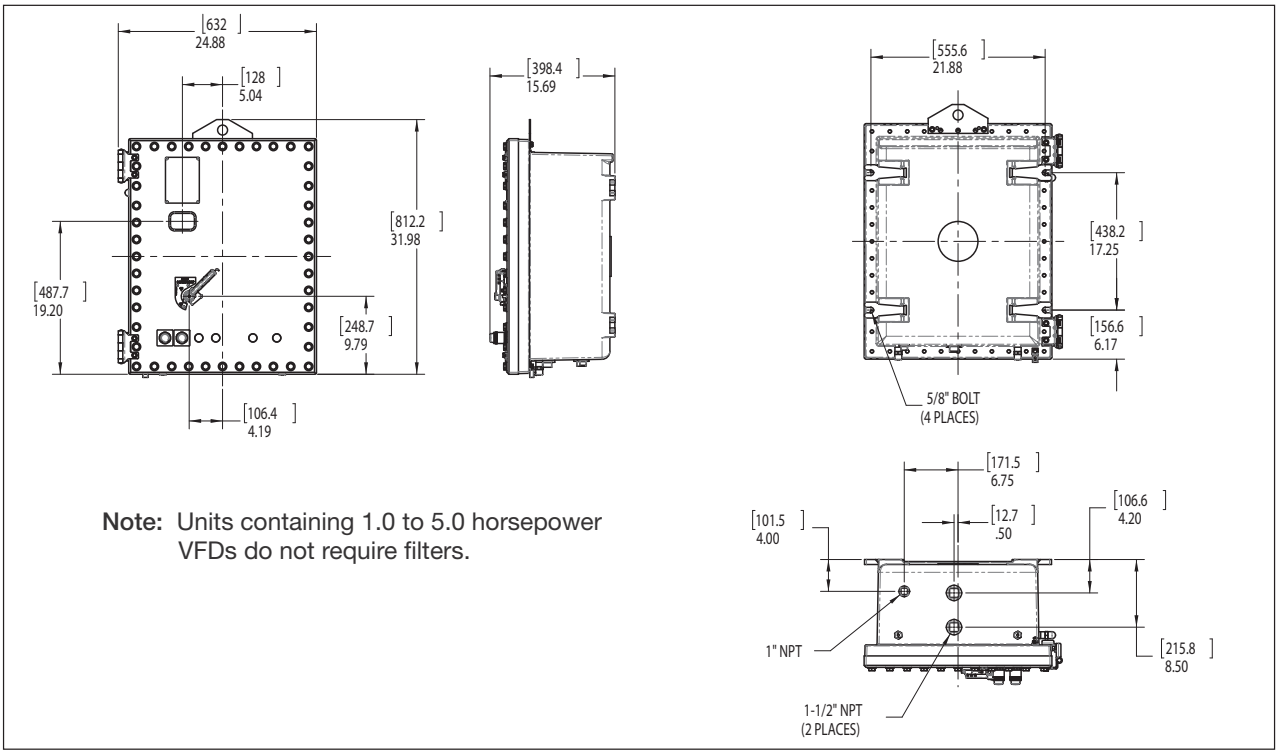


ACE Series Recommended Distributor Stock List:

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**

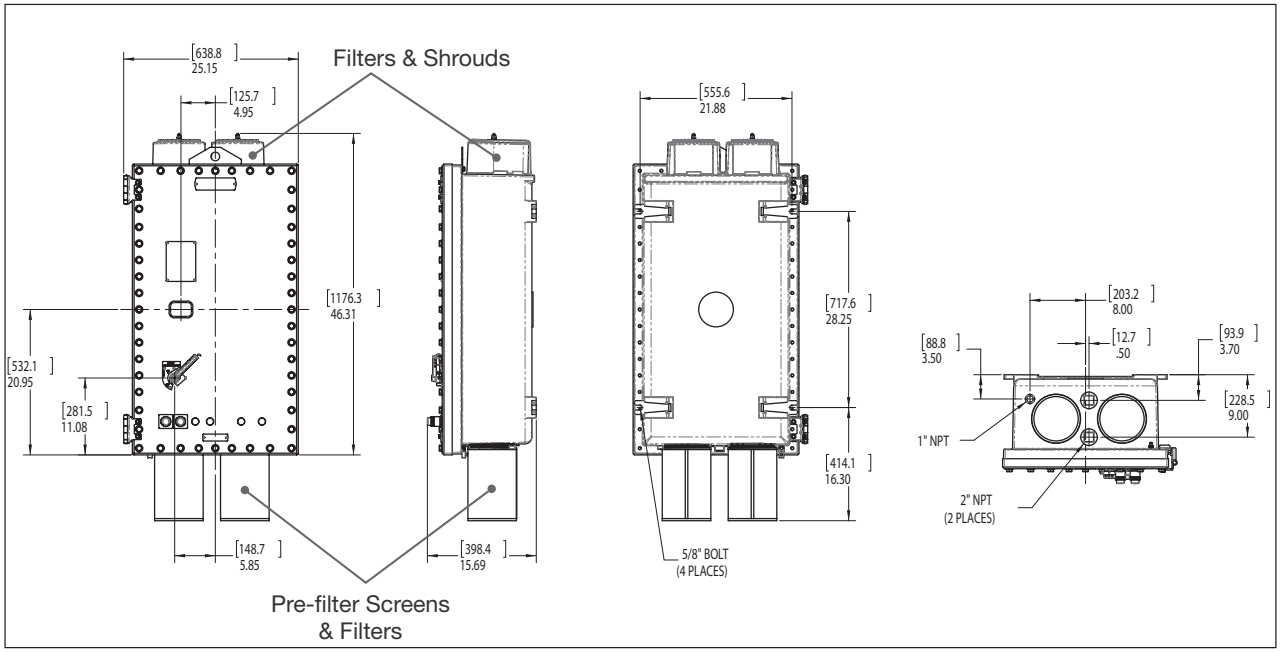
*5HP and below listed for Group B.

Dimensions
In Inches:



Note: Units containing 1.0 to 5.0 horsepower VFDs do not require filters.

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.

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

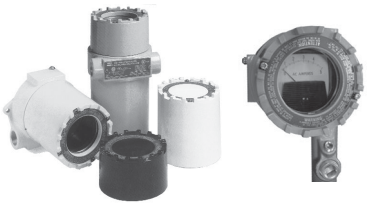
*Ratings may not be available or relevant for every proposal.

Labor Saving Solutions:

- Product sub-assemblies and sub-systems
- Pre-fixtured products, pre-terminated cables, plugs, fittings, and glands

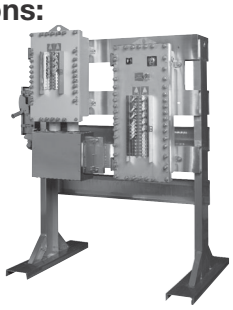
Integrated Solutions:

- 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.

Request a Quote

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
☐ Fittings & Glands
☐ Lighting
☐ Plugs & Receptacles
☐ Commercial Products
☐ 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
Phone: (866) 764-5454

7C Switch Rack 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
NEMA 3, 4X, 7BCD, 9EFG, 12	Watertight

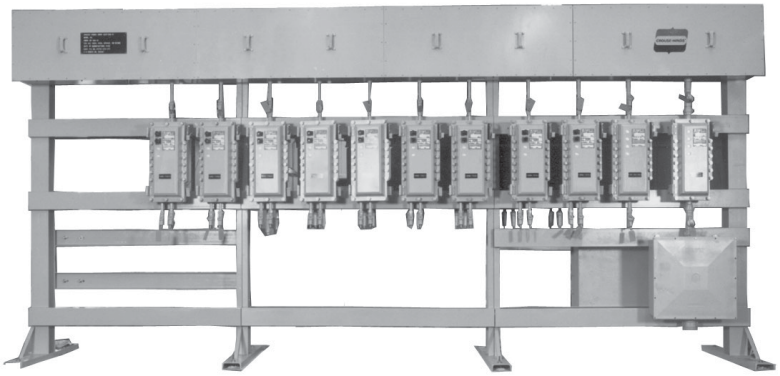
Applications:

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 Compliances:

- 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:

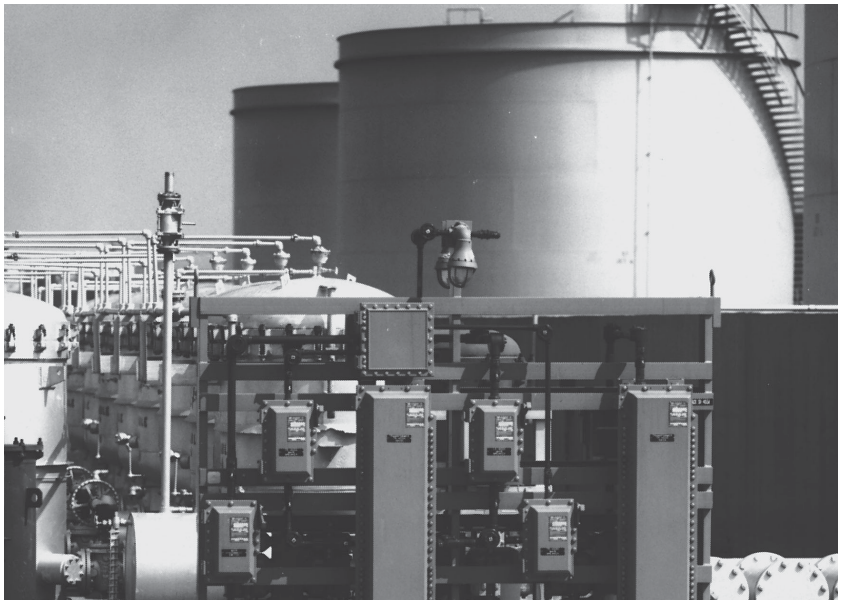
- Switch rack, either single or double face as required, shall be rigid, free-standing structures. Racks shall be factory-welded, assembled and fabricated from standard rolled structural steel or aluminum shapes.
- Vertical risers will be 6" I-beam and horizontal members shall be 6-inch channel.
- Mounting 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.



Eaton's Crouse-Hinds switch rack installed in a fuel storage area.

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.

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 integeral 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:

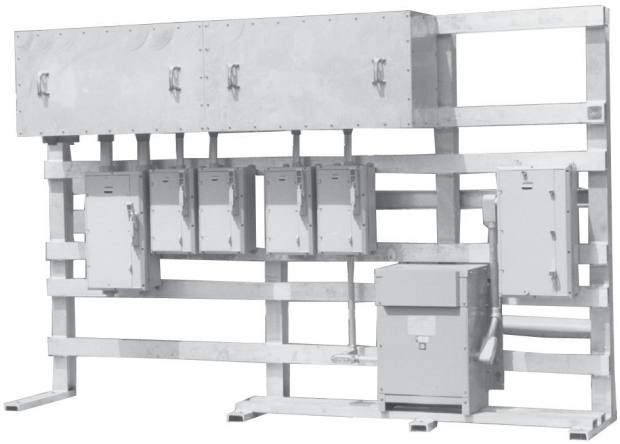
- Breathers and drains shall be Eaton's Crouse-Hinds ECD.

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.

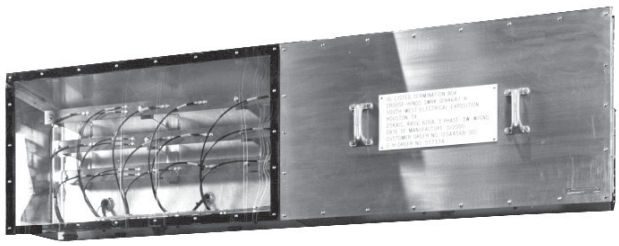


7C Bus Duct (Termination Box) Assemblies

NEMA 3R
Up to 600 Volts

Applications:

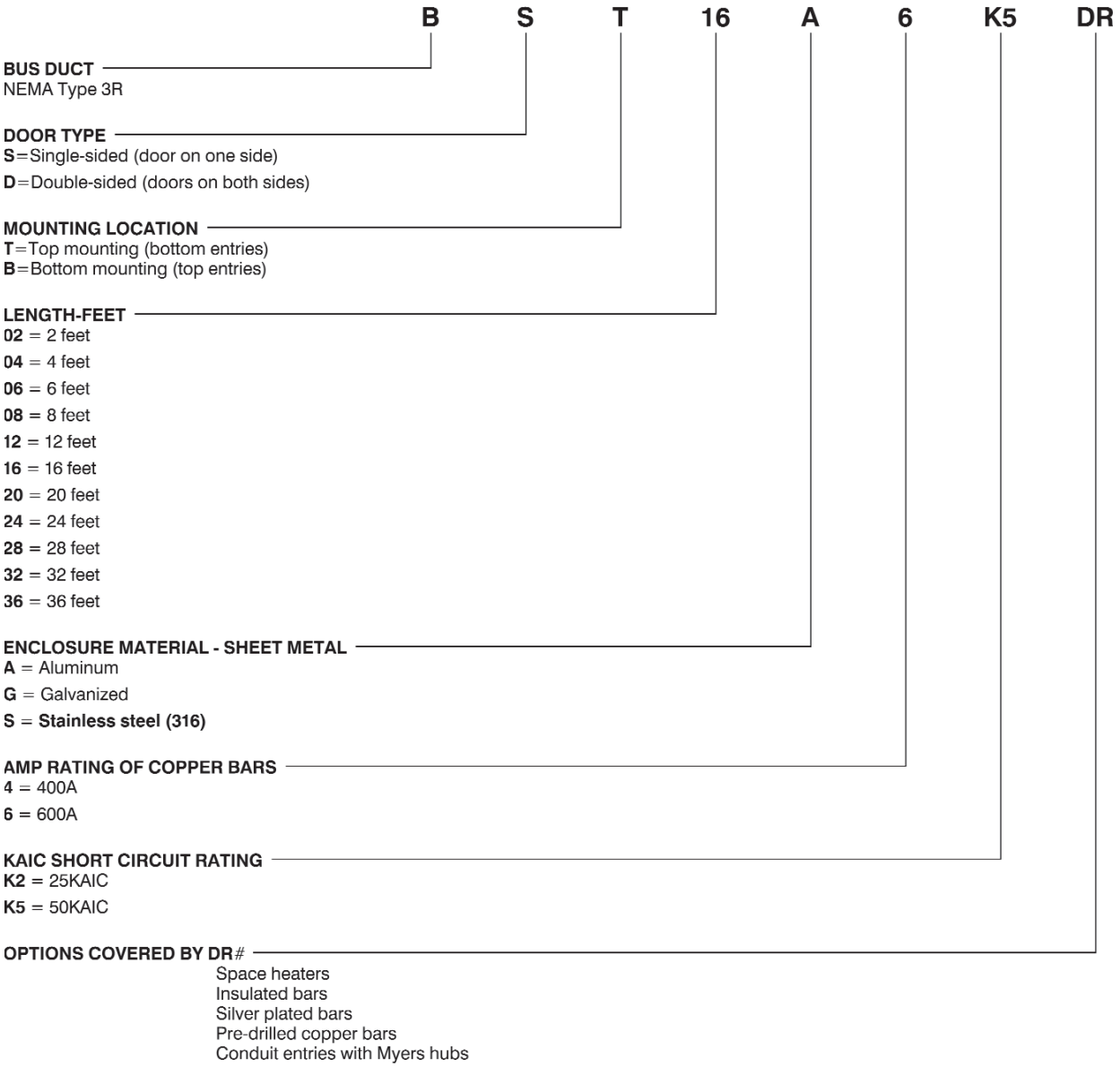
- Eaton's Crouse-Hinds is now offering NEMA 3R, UL Listed Bus Duct (Termination Box) Assemblies as standard product. Up to 600V, three-phase, 3 or 4 wire, 400Amp or 600Amp service with short circuit ratings of 25K or 50K.
- Bus ducts or termination boxes provide a means of tapping feeder circuits for 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.
- Chorosulfonated polyethlene (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 attatched 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



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 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

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)
☐ Insulated
☐ Silver Plated
☐ Tin Plated
☐ Power Distr. Block
☐ Ground Bus in Enclosure

Crouse-Hinds by EATON

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 Suffix FTPS	_____	_____
Space Heaters Suffix R11, R22, R44	_____	_____
Start/Stop Pushbuttons Suffix PB23	_____	_____
Hand-Off Auto Selection Switch Suffix RR3	_____	_____
Red Indicating Light Suffix J1	_____	_____
Green Indicating Light Suffix J3	_____	_____
*Auxiliary Contacts: (2 N.O./2NC) Suffix S782	_____	_____
Control Relay Suffix S787	_____	_____
*Breather/Drain Suffix S198V/S756V	_____	_____
*12 Point Terminal Block	_____	_____
Other - Specify 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) (No. Req'd) _____ AMP Rating _____
‡ EPD (30mA) (No. Req'd) _____ AMP Rating _____

7C Switch Rack Assemblies

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 FTPS
☐ 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

★Utilizing Standard Eaton's Crouse-Hinds NEMA 7 Enclosures with specified internal components (mounted on your switchrack) this state-of-the-art technology is available today. IMPACC (Intergrated Monitoring Protection and Control Communications), by Cutter-Hammer/Westinghouse is a unique high frequency-based communications system specially designed for electrical distribution and control applications. Providing real time information, with an ''open'' protocol, allows you to manage and operate your entire electrical system including remote hazardous areas without leaving your office or motor control centre. For more information, contact us.

Special Requirements: _____

