

Pushbuttons & Indicating Lights

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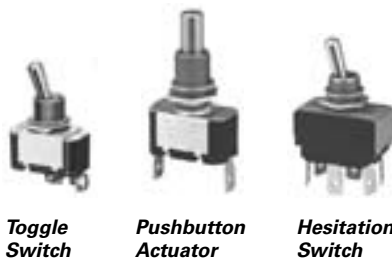


Pushbuttons and Indicating Lights

E10 Series

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Product Description

Cutler-Hammer® E10 switches from Eaton's electrical business are intended for general purpose light industrial use. Designed for retrofit and OEM applications, the one-hole mounted units feature a bright nickel plated lever and a 0.468"-32 diameter threaded bushing with a 0.068 x 0.035 inch (1.7 x 0.9 mm) deep keyway for anti-rotation. Mounting hardware, consisting of one hexagonal locknut, one knurled or hexagonal face nut, and #6-32 x 3/16" (where applicable) binding head terminal screw. All are furnished unassembled in individually sealed poly bags, packed 10 per carton.

Standards and Certifications

- UL Recognized — File No. 2702
- CSA — File No. LR40068

Technical Data and Specifications

Toggle Switches

- AC Ratings:
 - 6 – 20A, 125V AC
 - 3 – 10A, 250V AC
 - Max. 3/4 hp @ 250V AC
- DC Ratings:
 - 6 – 20A, 28V DC
- Electrical Life: 6,000 cycles make/break at switch ampere rating
- Operation:
 - Slow make/slow break mechanism with butt action for AC and low voltage DC applications
 - Maintained and momentary contacts
- Poles/Throws: 1 through 4, single and double throw

Mounting:

- One hole with threaded 0.468"-32 bushing and 0.068 x 0.035 inch (1.7 x 0.9 mm) deep keyway that serves as anti-rotational feature
- Lever Lengths: 0.563 inch (14.3 mm) or 0.688 inch (17.5 mm), bright nickel plated
- Terminals: Screw, 0.250 inch (6.4 mm) spade and solder lug

Hesitation Switches

Operation:

- Slow make/slow break mechanism with butt action for AC and low voltage DC applications; maintained contacts; ideal for reversing motor applications; patented interlock mechanism prevents operation of lever through centre position until manual pressure is momentarily relieved.

AC Ratings:

- 15A, 125V AC
- 10A, 250V AC
- Max. 3/4 hp at 250V AC

DC Ratings:

- 15A, 28V DC

- Poles/Throws: 2, 3 and 4, double throw only

Mounting:

- One pole with threaded 0.468"-32 bushing and 0.068 x 0.049 inch (1.7 x 1.2 mm) deep keyway

- Lever Length: 0.687 inch (17.4 mm), stainless steel

- Terminals: Screw

Pushbutton Actuators

AC Ratings:

- 6 – 15A, 125V AC (NO)
- 3 – 10A, 250V AC (NO)
- Max. 1/3 hp @ 125/250V AC

Operation:

- Slow make/slow break mechanism
- Normally open contacts

- Poles/Throws: Single, single and double throw

Mounting:

- One hole with 0.468"-32 threaded bushing and 0.068 x 0.035 inch (1.7 x 0.9 mm) deep keyway
- Two bushing heights: 11/16 inch (17.5 mm) and 11/32 inch (8.7 mm)





- Button Extensions: 17/32 inch (13.5 mm) and 1/4 inch (6.4 mm), bright nickel plated

- Terminals: Screw

Product Selection

Toggle Switches

Table 2-1. Toggle Switches — AC Rated — Minimum Order Quantity 10 Pieces

	Nominal AC Ratings			Poles and Throw ①	Function — Circuit with Lever In ②			Screw Terminal	0.250 Inch (6.4 mm) Spade Terminal	Solder Lug	
	Amperes		hp		UP Position	CENTRE Position	DOWN Position — Keyway	Catalogue Number	Catalogue Number	Catalogue Number	
	125V	250V	250V								
 1-Pole	1-Pole										
	6 15 20	3 10 10	— 3/4 3/4	1 P.S.T.	ON	None	OFF	E10T106AS E10T115AS E10E120AS	E10T106AP E10T115AP E10E120AP	E10T106AL E10T115AL E10E120AL	
	6 15 20	3 10 10	— 3/4 3/4	1 P.D.T.	ON	OFF	ON	E10T106DS E10T115DS E10E120DS	E10T106DP E10T115DP —	— E10T115DL —	
	6 15 20	3 10 10	— 3/4 3/4	1 P.D.T.	ON	None	ON	E10T106ES E10T115ES E10E120ES	— E10T115EP —	— E10T115EL —	
	—	10	1/2	1 P.S.T. 1 P.D.T. 1 P.D.T. 1 P.D.T.	OFF ON ON (ON)	None OFF None OFF	(ON) (ON) (ON) (ON)	E10T115BS E10T115FS E10T115HS E10T115GS	E10T115BP E10T115FP E10T115HP E10T115GP	— — — —	
	 2-Pole	2-Pole									
		6 15 20	3 10 10	— 3/4 3/4	2 P.S.T.	ON	None	OFF	E10T206AS E10T215AS E10E220AS	E10T206AP E10T215AP E10E220AP	— E10T215AL E10E220AL
		6 15 20	3 10 10	— 3/4 3/4	2 P.D.T.	ON	OFF	ON	E10T206DS E10T215DS E10E220DS	E10T206DP E10T215DP E10E220DP	— E10T215DL —
		6 15 20	3 10 10	— 3/4 3/4	2 P.D.T.	ON	None	ON	E10T206ES E10T215ES E10E220ES	— E10T215EP —	— E10T215EL —
15		10	1/2	2 P.S.T. 2 P.D.T. 2 P.D.T.	OFF ON (ON)	None None OFF	(ON) (ON) (ON)	E10T215BS E10T215HS E10T215GS	— E10T215HP E10T215GP	— — —	
 3-Pole		3-Pole									
	15	10	3/4	3 P.S.T. 3 P.D.T. 3 P.D.T.	ON ON ON	None OFF None	OFF ON ON	E10E315AS E10E315DS E10E315ES	E10E315AP E10E315DP E10E315EP	— E10E315DL E10E315EL	
 4-Pole	4-Pole										
	15	10	3/4	4 P.S.T. 4 P.D.T. 4 P.D.T.	ON ON ON	None OFF None	OFF ON ON	E10E415AS E10E415DS E10E415ES	— — —	E10E415AL E10E415DL E10E415EL	

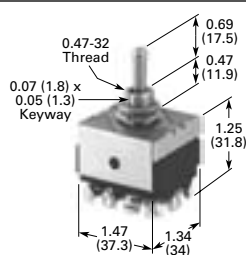
① See Figure 2-1 Circuit Arrangements on Page 2-4.

② () = Momentary contacts, spring return action.

E10 Series, Hesitation Switches and Actuators

Hesitation Switches

Table 2-2. Hesitation Switches — Special Purpose — Minimum Order Quantity 10 Pieces

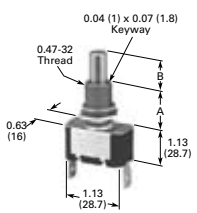
Approximate Dimensions in Inches (mm)	Nominal Ratings				Operation	Function — Circuit with Lever In			Poles and Throw ①	Screw Terminal Catalogue Number
	Amperes		hp			UP Position	CENTRE Position	DOWN Position — Keyway		
	28V DC	125V AC	250V AC	250V AC						
	15	15	10	3/4	Maintained	ON	OFF	ON	2 P.D.T. 3 P.D.T. 4 P.D.T.	E10E215SS E10E315SS E10E415SS

① See Figure 2-1 Circuit Arrangements below.

Note: Interlock mechanism prevents operation of lever through the centre position until pressure is momentarily relieved. Designed for control and protection of reversing motors.

Pushbutton Actuators

Table 2-3. Pushbutton Actuators — Minimum Order Quantity 10 Pieces

Approximate Dimensions in Inches (mm)	Nominal Ratings					Poles and Throw ②	Contacts	Bushing Length Inches (mm) Dim. "A"	Button Extension Inches (mm) Dim. "B"	Typical Maximum Operating Force	Screw Terminal	Spade Terminal 0.250 Inch (6.4 mm)
	Amperes AC		hp		Catalogue Number						Catalogue Number	
	125V	250V	125 -	250V								
	NO	NC	NO	NC								
	6	—	3	—	—	1 P.S.T.	NO	0.69 (17.5) 0.34 (8.6)	0.53 (13.5) 0.25 (6.4)	0.9 lbs.	E10P106RS E10P106JS	E10P106RP —
	15	—	10	—	1/3	1 P.S.T.	NO	0.69 (17.5) 0.34 (8.6)	0.53 (13.5) 0.25 (6.4)	0.9 lbs.	E10P115RS E10P115JS	E10P115RP —
	15	10	10	5	1/4 ③	1 P.D.T.	NO, NC	0.69 (17.5)	0.53 (13.5)	1.0 lbs.	E10P115LS	—

② See Figure 2-1 Circuit Arrangements below.

③ Rated 1/4 hp at 125V, 1/2 hp at 250V.

Circuit Arrangements

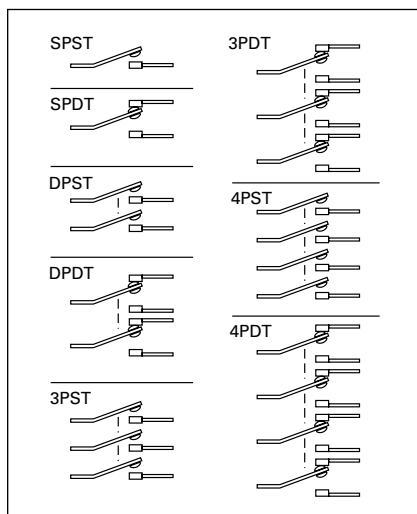
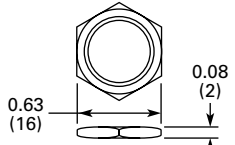

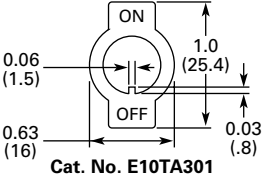
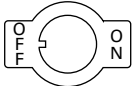



Figure 2-1. Circuit Arrangements

Accessories

Table 2-4. Accessories — Minimum Order Quantity 100 Pieces

Description	Material/Notes	Catalogue Number	Approximate Dimensions in Inches (mm)
Hexagon Locknut	Zinc-Chromate Treated Steel	E10TA101	 <p>Hexagon Locknut Cat. No. E10TA101</p>
Knurled Face Nut	Zinc-Chromate Treated Steel	E10TA102	 <p>Knurled Face Nut Cat. No. E10TA102</p>
Internal Tooth Lockwasher	Cadmium Plated Steel	E10TA103	
Terminal Screws	#6-32 x 3/16" Binding Head	E10TA201	
Spade Terminal Adapter — 0.250 inch (6.4 mm)	Assembles to Screw Terminals	E10TA202	
ON-OFF Indicating Plates — Vertical Orientation Horizontal Orientation	Burnished Nickel Finish Steel	E10TA301 E10TA302	 <p>Cat. No. E10TA301</p>  <p>Cat. No. E10TA302</p>
Flip-Up Guard for Toggle Switches		E10TA104	
Fixed Shroud for Toggle Switches		E10TA105	

Dimensions

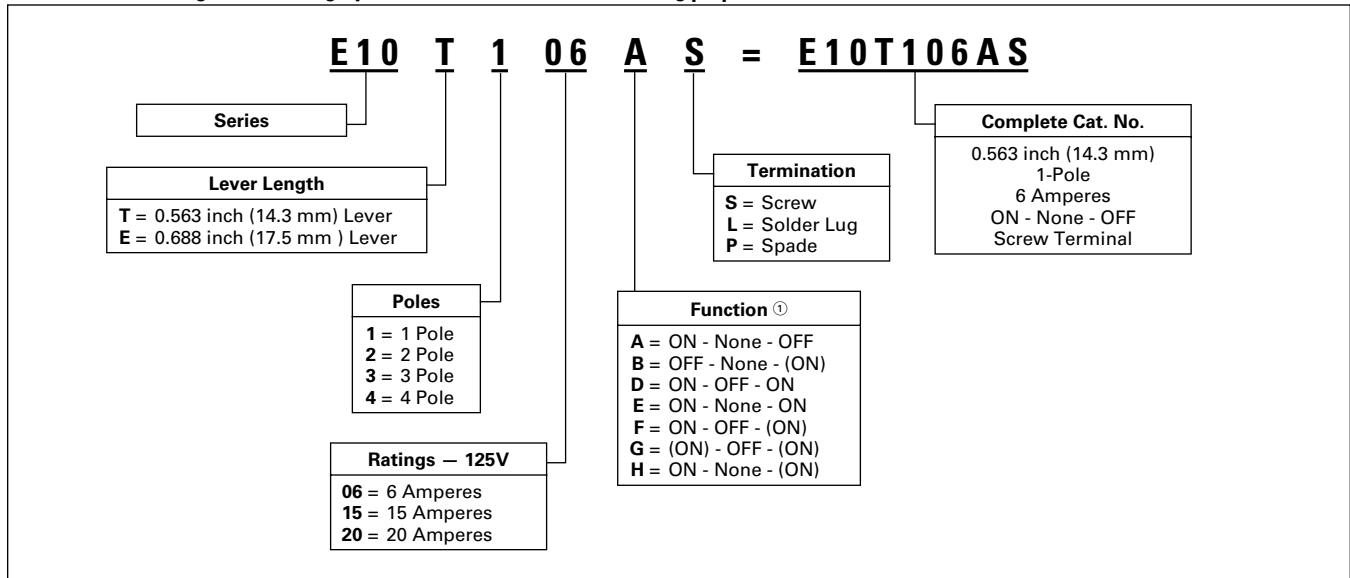
Table 2-5. Toggle Switch — Approximate Dimensions

	No. of Poles	Operation	Approximate Dimensions in Inches (mm)										
			Bushing Length A	Lever Length B	Screw Terminals			Spade Terminals			Solder Lug		
			C	D	E	C	D	E	C	D	E		
	1	Momentary & Maintained	0.47 (11.9)	0.56 (14.2)	1.00 (25.4)	1.17 (29.7)	0.63 (16.0)	1.13 (28.7)	1.13 (28.7)	0.63 (16.0)	1.00 (25.4)	1.13 (28.7)	0.63 (16.0)
	2	Maintained	0.47 (11.9)	0.56 (14.2)	1.06 (26.9)	1.31 (33.3)	0.75 (19.1)	1.19 (30.2)	1.31 (33.3)	0.75 (19.1)	1.06 (26.9)	1.31 (33.3)	0.75 (19.1)
		Momentary	0.47 (11.9)	0.56 (14.2)	1.25 (31.8)			1.31 (33.3)			1.25 (31.8)		
	3	Maintained	0.47 (11.9)	0.69 (17.5)	1.27 (32.3)	1.34 (34.0)	1.44 (36.6)	1.37 (34.8)	1.34 (34.0)	1.44 (36.6)	1.23 (31.2)	1.34 (34.0)	1.44 (36.6)
4	Maintained	0.47 (11.9)	0.69 (17.5)	1.20 (30.5)	1.30 (33.0)	1.40 (35.6)	1.30 (33.0)	1.34 (34.0)	1.40 (35.6)	1.23 (31.2)	1.34 (34.0)	1.44 (36.6)	

Note: Spade terminal adapters are used on 6 ampere, 20 ampere and momentary screw terminal switches, adding 0.42 (10.7) to dimension C.

Catalogue Number Structure

Table 2-6. E10 Catalogue Numbering System — Not to be used for ordering purposes



① () = Momentary contacts, spring return action.

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Features

E22 Control Stations



Cat. No. E22AS204

- 22.5 mm operators
- Industrial grade
- Impact resistant polycarbonate enclosures
- Compact wall mount
- Optional yellow covers
- Popular with OEMs
- NEMA 4, 4X, 12, 13

General Purpose Control Stations



Cat. No. 10250H5200

- Construction grade
- General purpose wall mount
- Popular with contractors
- NEMA 1

Special Purpose Control Stations



Cat. No. 10250H364

- Standard grade
- Polyester enclosure
- NEMA 3, 3R, 4, 4X, 13

Heavy-Duty Control Stations



Cat. No. 10250H1913

- Industrial grade
- Extra heavy-duty
- Polyester enclosure
- Booted buttons
- Outdoor installation
- NEMA 3, 3R, 3S, 4, 4X, 12, 13

10250T Control Stations



Cat. No. 10250T3525

- 30.5 mm operators
- Industrial grade
- Zinc die cast enclosure
- Popular with industrial end users
- NEMA 4, 4X, 12, 13

Class I Division 2 Control Stations



Cat. No. E34EX7023P

- Available with 10250T or E34 30.5 mm operators
- Zinc die cast, polyester or stainless steel enclosures
- Factory-sealed contact blocks
- Popular with industrial end users
- NEMA 4, 4X, 12, 13
- NEC Class I Division 2 Groups B, C and D



E22 Series, 22.5 mm Pushbutton Stations






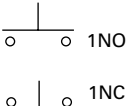



Emergency Stop Station

Assembled E22 Control Stations

Product Description

- E22 Series black bezel pushbuttons
- Light grey polycarbonate enclosures
- Single 21 mm diameter hole for cable entry

Table 2-7. Product Selection — Emergency Stop Stations — UL (NEMA) 4, 4X, 12, 13

Operator	Contact Symbol	Button Type/Colour	Legend Marking	Catalogue Number ③
 Cat. No. E22AT111	 1NC	40 mm Latching Trigger Action/Red	EMERGENCY STOP RoundYellow Nameplate	E22AT111 ①
		40 mm Latching Trigger Action/Red	EMERGENCY STOP SafetyYellow Guard	E22AT112 ①
		40 mm Latching Trigger Action/Red	EMO SafetyYellow Cover	E22AT113 ①
		40 mm Latching Trigger Action/Red	EMO SafetyYellow Guard	E22AT114 ①
 Cat. No. E22AT111C	 1NO 1NC	40 mm Latching Trigger Action/Red	EMERGENCY STOP RoundYellow Nameplate	E22AT111C ①
		40 mm Latching Trigger Action/Red	EMERGENCY STOP SafetyYellow Guard	E22AT112C ①
		40 mm Latching Trigger Action/Red	EMO SafetyYellow Cover	E22AT113C ①
		40 mm Latching Trigger Action/Red	EMO SafetyYellow Guard	E22AT114C ①
 Cat. No. E22AT111E		40 mm Latching Trigger Action/Red	EMERGENCY STOP RoundYellow Nameplate	E22AT111E ①
		40 mm Latching Trigger Action/Red	EMERGENCY STOP SafetyYellow Guard	E22AT112E ①
		40 mm Latching Trigger Action/Red	EMO SafetyYellow Cover	E22AT113E ①
		40 mm Latching Trigger Action/Red	EMO SafetyYellow Guard	E22AT114E ①
 Cat. No. E22ASB106	 1NC	40 mm Mushroom, Momentary Action/Red	EMERGENCY STOP Yellow Cover	E22ASB105 ②
		40 mm Latch in Twist-to-Release/Red	EMERGENCY STOP Yellow Cover	E22ASB106 ②

① Compliant with EN418 Machinery Safety Directive.

② Non-compliant with EN418 requirements.

③ For Dimensions, see Page 2-17.




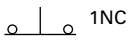
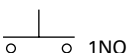

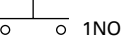
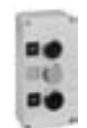
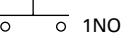
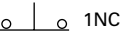
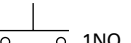
E-Stop Control Station

Assembled E-Stop Control Stations

Product Description

- Safety-yellow cover and light grey base enclosures
- Polycarbonate enclosures
- Single 21 mm diameter hole for cable entry.

Table 2-8. Product Selection — Assembled Control Stations — UL (NEMA) 4, 4X, 12, 13

Operator	Contact Symbol	Button Type/Colour	Legend Marking	Catalogue Number ^{①②}	
 Cat. No. E22ASB109	 1NC	Extended/Red	STOP	E22ASB109	
	 1NO	Flush/Green	START	E22ASB108	
 Cat. No. E22AS204	 1NO	Flush/Green Extended/Red	START STOP	E22ASB204	
		Flush/Green Mushroom/Red	START STOP	E22ASB205	
		Flush/Green Latch-In Twist-to-Release/Red	START STOP	E22ASB206	
 Cat. No. E22AS304	 1NO	Flush/Black Extended/Red Flush/Black	FOR STOP REV	E22ASB304	
		 1NC	Flush/Black Extended/Red Flush/Black	CLOSE STOP OPEN	E22ASB305
		 1NO	Flush/Black Extended/Red Flush/Black	UP STOP DOWN	E22ASB306

① To order pushbuttons with chrome bezels, remove 6th character **B** from the Catalogue Number and add \$1.00 to the list price shown for each chrome bezel pushbutton. Example: E22AS108-START Flush/Green pushbutton station, price \$61.00.



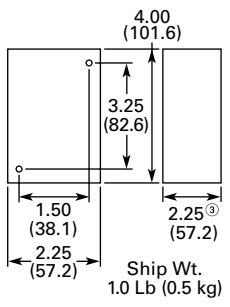






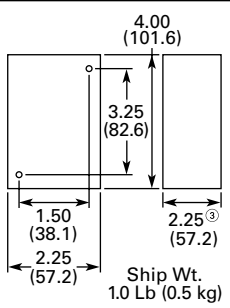


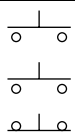
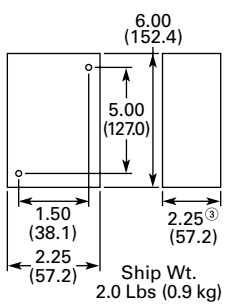

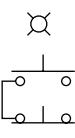
② For Dimensions, see **Page 2-17**.



10250H Series, General Purpose Stations

General Purpose Type N Control Stations

Table 2-9. Product Selection — Type N Assembled Control Stations — NEMA 1

Enclosure Type	Contact Symbol	Button Type/Colour	Button Engraving (See ① for other legends)	Catalogue Number	Approximate Dimensions in Inches (mm)
One Element					
Single Button with Padlock Attachment Accessory 		Flush/Green	START	10250H5100	 <p>4.00 (101.6) 3.25 (82.6) 1.50 (38.1) 2.25^③ (57.2) 2.25 (57.2) Ship Wt. 1.0 Lb (0.5 kg)</p>
		Flush/Red	STOP	10250H5101	
		Extended/Red	STOP	10250H5104	
		Palm Operated/Black	None	10250H89 ②	
Selector Switch 		3-Position Selector Switch/Black Knob	RUN/OFF/AUTO	10250H289 ②	
Two Element					
Two Button Station 		Flush/Red	START/STOP	10250H5200	 <p>4.00 (101.6) 3.25 (82.6) 1.50 (38.1) 2.25^③ (57.2) 2.25 (57.2) Ship Wt. 1.0 Lb (0.5 kg)</p>
		Flush/Green Extended/Red	START/STOP	10250H5207	
		Flush/Black (All)	RAISE/LOWER FOR/REV OPEN/CLOSE UP/DOWN HIGH/LOW FAST/SLOW	10250H5201 10250H5202 10250H5203 10250H5204 10250H5205 10250H5208	
Three Element					
Three Button Stations 		Flush/Black (All)	FOR/REV/STOP UP/DOWN/STOP RAISE/LOWER/STOP OPEN/CLOSE/STOP FAST/SLOW/STOP	10250H5300 10250H5301 10250H5302 10250H5303 10250H5304	 <p>6.00 (152.4) 5.00 (127.0) 1.50 (38.1) 2.25^③ (57.2) 2.25 (57.2) Ship Wt. 2.0 Lbs (0.9 kg)</p>
Three Button with Indicating Light 		110/220V Neon Indicating Light Clear — Flush/Green; Flush/Red Red — Flush/Green; Flush/Red Amber — Flush/Green; Flush/Red	START/STOP	10250H5310 10250ED853 10250ED853-2	

① Other legends including horizontal mounting or blank are available on all stations. For other legends, specify marking (limited to one line with a maximum of 5 characters).

② Round button.







③ 2.38 (60.5) for neon indicating light, 2.56 (65.0) for potentiometer.

April 2009

10250H Series, General Purpose Stations

General Purpose Type N Open Type Assemblies

Table 2-10. Product Selection — Type N — Open Type Construction (No Cover)

Enclosure Type	Contact Symbol	Button Type/Colour	Button Engraving (See ① for other legends)	Catalogue Number	Approximate Dimensions in Inches (mm)
One Element					
		3-Position Selector Switch/Black Knob	RUN/OFF/AUTO	10250H2538	
Two Element					
		Flush/Green	START/STOP	10250H2747	
		Flush/Black (All) Mech. Interlocked	None ②	10250H2544	

① Other legends including horizontal mounting or blank are available on all stations. For other legends, specify marking (limited to one line with a maximum of 5 characters).

② No legend on button. Specify any standard legend, no change in price.

Table 2-11. Accessories


	Description	Catalogue Number
	Padlock Attachment — For field assembly on square button type (except extended button types)	10250H5110



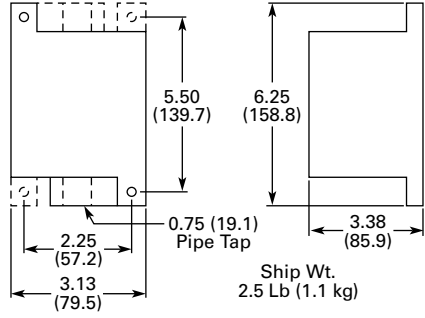






Table 2-12. Maximum Ampere Ratings

Voltage	AC				DC		
	110V	220V	440V	550V	120V	240V	600V
Make and Emergency Interrupt Capacity	30	15	7.5	6	1.0	0.5	0.1
Normal Load Break	3	1.5	0.75	0.6	1.0	0.5	0.1
Continuous Current	10	10	10	10	10	10	10



Special Purpose Control Stations

Table 2-13. Product Selection — Special Purpose Control Stations — NEMA 3, 3R, 4, 4X, 13

	Type	Feature	Symbol	Standard Legend ①	Catalogue Number	Approximate Dimensions in Inches (mm)
	One Element Push-button	Flush		START	10250H2738	
				STOP	10250H658	
		With Lock Hasp		STOP	10250H665	
	Two Element Push-button	Flush		START/STOP	10250H364	
		With Lock Hasp		START/STOP	10250H671	
		Buttons Interlocked		FAST/SLOW FOR/REV UP/DOWN OPN/CLOSE	10250ED664 10250H2740 10250H2741 10250H2742	
Cat. No. 10250H364						

① For other legends specify marking (limited to one line with a maximum of 5 characters).

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10250H Series, Heavy-Duty Stations

Heavy-Duty Type H Control Stations


Product Description

- 10250T Series operators
- Dark brown polyester enclosure
- Protective rubber gaskets provide NEMA 3S rating on pushbuttons
- Top and bottom 3/4-inch NPT conduit entrances
- Includes alternate legend plates and spare mounting screws


Table 2-14. Product Selection — Type H Control Stations — UL (NEMA) 3, 3S, 4, 4X, 12, 13

	Type of Element	Feature	Circuit	Assembled Legend Plate	Unassembled Alternate Legend Plates	Catalogue Number
--	-----------------	---------	---------	------------------------	-------------------------------------	------------------

One Element

	Pushbuttons	Without Padlock Hasp	1NO-1NC	JOG	START STOP RUN	10250H1881
		With Padlock Hasp	1NC	STOP	—	10250H4239
	Knob Selector Switch	2-Position 3-Position	1NO-1NC 1NO-1NC	OFF/ON MAN/OFF/AUTO	— —	10250H4526 10250H4527

Two Element

	Pushbuttons	Standard	1NO-2NC	START/STOP	—	10250H1884
			2NO-2NC	RAISE/LOWER	FORWARD REVERSE OPEN CLOSE	10250H1885
		Standard and Standard w/ Padlock Hasp	1NO-2NC	START/STOP	—	10250H4240

Three Element


 <i>Cat. No. 10250H1913</i>	Pushbuttons	Standard	2NO-3NC	FOR/REV/STOP	START JOG RAISE LOWER	OPEN CLOSE FAST SLOW	10250H1890
		2 Standard and Standard w/ Padlock Hasp	2NO-3NC	FOR/REV/STOP	—	10250H4241	
	Indicating Light and Push-buttons	120V	Light-Red Lens and 2 Plain	1NO-2NC	MOTOR RUNNING START/STOP	—	10250H1913

Table 2-15. Approximate Dimensions in Inches (mm)

NEMA Type	No. of Elements	Dimensions		
		Wide	High	Deep
3, 3R, 3S, 4, 4X, 13	1 and 2	4.50 (114.3)	8.25 (209.6)	4.50 (114.3)
	3	4.50 (114.3)	10.75 (273.1)	4.25 (108.0)

Table 2-16. Maximum Ampere Ratings

Description	Volts AC 50/60 Hz				Volts DC	
	120	240	480	600	125	250
Make and Emerg. Inter. Capacity	60	30	15	12	1.1	0.55
Normal Load Break	6	3	1.5	1.2	1.1	0.55
Continuous Amperes	10	10	10	10	10	10
Voltamperes —						
Make and Emerg. Inter. Cap.	7200	7200	7200	7200	138	138
Normal Load Break	720	720	720	720	138	138








10250T Series, 30.5 mm Pushbutton Stations

10250T Heavy-Duty 30.5 mm Control Stations

Product Description

- 10250T Series operators
- Surface or flush mounting
- Single 1-inch NPT conduit entrance on three element stations
- ASA 61 grey die-cast zinc enclosures
- Single 3/4-inch NPT conduit entrance on one and two element stations

Table 2-17. Product Selection — Complete Assembled Stations — UL (NEMA) 4, 4X, 12, 13

Number of Elements	Type of Elements ②	Feature	Contact Block(s)	Legend	Surface Mounting	Flush Mounting ④
					Catalogue Number	Catalogue Number
	Break Glass Station ①	Grey Enclosure Red Enclosure	NC (Logic Level)	EMERG. OFF EMERG. OFF	10250TGS 10250TGR	— —
	Pushbutton	Standard	NO-NC NC NO-NC	START STOP None	10250T3516 10250T3518 10250T3540	10250T3573 10250T3575 10250T3597
		Mushroom Head	NO-NC NC	START STOP	10250T3517 10250T3519	10250T3574 10250T3576
		With Lock Hasp ⑤	NC	STOP	10250T3520	10250T3577
	Selector Switch	2-Position Black Knob	NO-NC	OFF/ON	10250T3523	10250T3580
		3-Position Black Knob	2NO	MAN/OFF/AUTO	10250T3524	10250T3581
Push-Pull 3-Position	Momentary Red Button		START/STOP	10250T3545	10250T3602	
	Pushbuttons	Standard	1NO-2NC 2NO-2NC 2NO-2NC	START/STOP RAISE/LOWER None	10250T3525 10250T3672 10250T3541	10250T3582 10250T3673 10250T3598
		With Lock Hasp ⑤	1NO-2NC	START/STOP	10250T3542	10250T3599
		Standard and Mushroom Head	1NO-2NC	START/STOP	10250T3526	10250T3583
		Standard with Maintained Contact ③	NO-NC Plus NC	START/STOP	10250T3528	10250T3585
	Pushbuttons	Standard	2NO-3NC 2NO-3NC 2NO-3NC 2NO-3NC	FOR, REV, STOP UP, DOWN, STOP OPEN, CLOSE, STOP None, None, STOP	10250T3532 10250T3615 10250T3614 10250T3543	10250T3589 — — 10250T3600
		2 Standard and with Lock Hasp	2NO-3NC	None, None, STOP	10250T3544	10250T3601
	Indicating Light (Transformer Type) and Pushbuttons	Red Lens — 110V Red Lens — 220V Red Lens — 440V Red Lens — 550V	1NO-2NC	MOTOR RUN, START/STOP	10250T3536 10250T3537 10250T3538 10250T3539	10250T3593 10250T3594 10250T3595 10250T3596

- ① Breaking glass closes contact.
- ② Stop buttons are red — all others are black.
- ③ Uses deep cover instead of shallow cover. Switch component is 10250TA67.
- ④ NEMA 4 – 13, if properly mounted on a flat surface. Consists of front plate, legend, operator and contact blocks.
- ⑤ Lock is 10250TA2.



Break Glass Operator Shown Assembled to Contact Block (Contact Block Supplied Separately)

Table 2-18. Break Glass Kit

Description	Catalogue Number
Operator with Hammer and 5 Glass Discs	10250TBG
Glass Discs Only (5)	10250TGL

Dimensions **Pages 2-159 – 2-161**
Renewal Parts **Pages 2-156 – 2-157**

Class I Division 2 10250T Heavy-Duty 30.5 mm Control Stations

Product Description

- 10250T Series operators
- Factory sealed contact blocks
- Die-cast, polyester or stainless steel enclosures
- Approved for NEC Class I Division 2, Groups B, C and D or Class I Zone 2 Group IIB plus Hydrogen type hazardous locations



Die Cast Enclosure with One Pushbutton — Aluminum Jumbo Mushroom Red-Engraved EMER. STOP Catalogue Number 10250T7007



Polyester Enclosure with Two Pushbuttons — Flush Green and Extended Red Catalogue Number 10250T7023P



Stainless Steel Enclosure with One Red Pilot and Two Pushbuttons — Flush Green and Extended Red Catalogue Number 10250T7033S

Table 2-19. Product Selection — Complete 10250T Assembled Stations — UL (NEMA) 4, 4X, 12, 13; NEC Class I Division 2, Groups B, C and D

Operator	Contact Symbol	Button Type/Colour	Legend Marking	Die Cast Enclosure	Polyester Molded Enclosure	Stainless Steel Enclosure
				Catalogue Number	Catalogue Number	Catalogue Number
One Pushbutton		Flush/Green	START	10250T7003	10250T7003P	10250T7003S
		Extended/Red	STOP	10250T7005	10250T7005P	10250T7005S
		Alum. Jumbo Mushroom/Red	EMER. STOP (Engraved Button)	10250T7007	10250T7007P	10250T7007S
		Flush/Black	No Legend	10250T7009	10250T7009P	10250T7009S
Two Pushbuttons		Flush/Green Extended/Red	START STOP	10250T7023	10250T7023P	10250T7023S
		Flush/Black Flush/Black	No Legend No Legend	10250T7025	10250T7025P	10250T7025S
One Pilot Light Two Pushbuttons		120V AC Red Flush/Green Extended/Red	No Legend START STOP	10250T7033	10250T7033P	10250T7033S
		120V AC Red Flush/Black Flush/Black	No Legend	10250T7035	10250T7035P	10250T7035S
3-Position Selector Switch		Maintained Knob/Black	HAND/OFF/AUTO	10250T7011	10250T7011P	10250T7011S
		Maintained Knob/Black	No Legend	10250T7013	10250T7013P	10250T7013S
One Pushbutton Maintained		Push-Pull w/Jumbo Mushroom/Red	EMER. STOP (Engraved Button)	10250T7019	10250T7019P	10250T7019S



Enclosure Dimensions Page 2-17
Operator Dimensions Pages 2-159 – 2-161

E34 Series, Class I Division 2 Corrosion Resistant Stations

Class I Division 2 E34 Corrosion Resistant 30.5 mm Control Stations

Product Description

- E34 Series operators
- Factory sealed contact blocks
- Die-cast, polyester or stainless steel enclosures
- Approved for NEC Class I Division 2 Groups B, C and D or Class I Zone 2 Group IIB plus Hydrogen type hazardous locations



Polyester Enclosure with Two Pushbuttons — Flush Green and Extended Red, Catalogue Number E34EX7023P

Table 2-20. Product Selection — Complete E34 Assembled Stations — UL (NEMA) 4, 4X, 12, 13; NEC Class I Division 2, Groups B, C and D

Operator	Contact Symbol	Button Type/Colour	Legend Marking	Die Cast Enclosure	Polyester Molded Enclosure	Stainless Steel Enclosure
				Catalogue Number	Catalogue Number	Catalogue Number
One Pushbutton		Flush/Green	START	E34EX7003	E34EX7003P	E34EX7003S
		Extended/Red	STOP	E34EX7005	E34EX7005P	E34EX7005S
		Alum. Jumbo Mushroom/Red	EMER. STOP (Engraved Button)	E34EX7007	E34EX7007P	E34EX7007S
		Flush/Black	No Legend	E34EX7009	E34EX7009P	E34EX7009S
Two Pushbuttons		Flush/Green Extended/Red	START STOP	E34EX7023	E34EX7023P	E34EX7023S
		Flush/Black Flush/Black	No Legend No Legend	E34EX7025	E34EX7025P	E34EX7025S
		3-Position Selector Switch		Maintained Knob/Black	HAND/OFF/AUTO	E34EX7011
One Pushbutton Maintained		Maintained Knob/Black	No Legend	E34EX7013	E34EX7013P	E34EX7013S
		Push-Pull w/Jumbo Mushroom/Red	EMER. STOP (Engraved Button)	E34EX7019	E34EX7019P	E34EX7019S

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see [Page 2-15](#).

Enclosure Dimensions [Page 2-17](#)
Operator Dimensions [Page 2-190](#)

Dimensions

E22

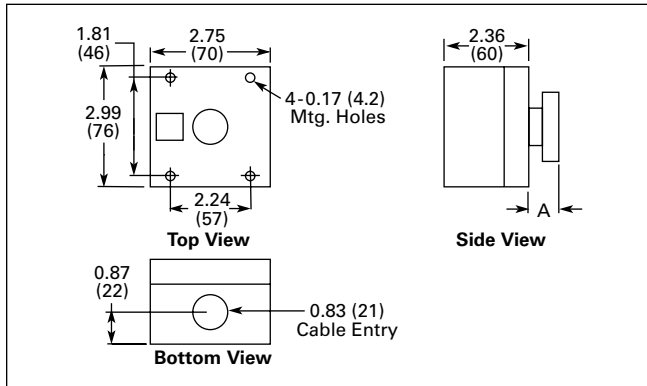


Figure 2-2. One-Element — Approximate Dimensions in Inches (mm)

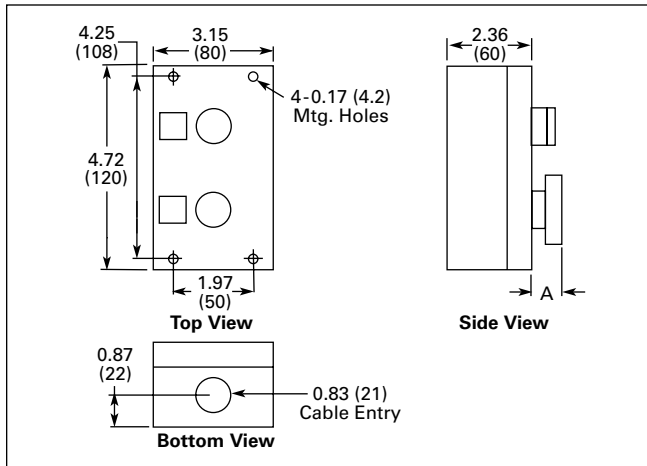


Figure 2-3. Two-Element — Approximate Dimensions in Inches (mm)

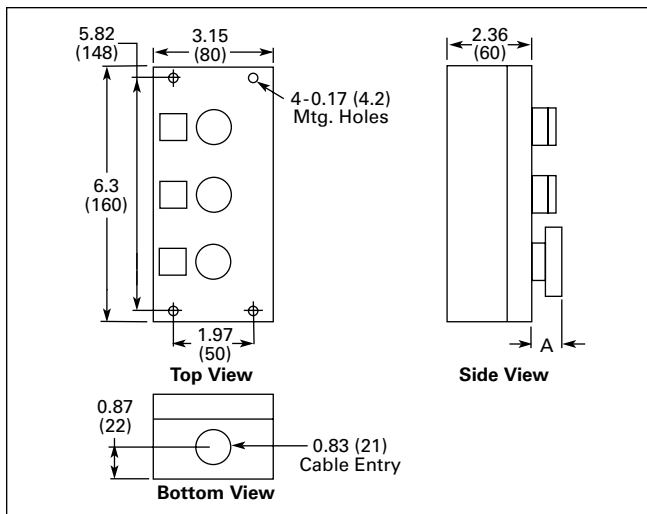


Figure 2-4. Three-Element — Approximate Dimensions in Inches (mm)

Table 2-21. E22 One-Element, Two-Element and Three-Element Approximate Dimensions

Catalogue Number	Dimension A in Inches (mm)	Catalogue Number	Dimension A in Inches (mm)
E22ASB105	0.87 (22.0)	E22ASB304	0.65 (16.4)
E22ASB106	0.87 (22.0)	E22ASB305	0.65 (16.4)
E22ASB108	0.57 (14.4)	E22ASB306	0.65 (16.4)
E22ASB109	0.65 (16.4)	E22AT111	1.32 (33.5)
E22ASB204	0.65 (16.4)	E22AT112	1.32 (33.5)
E22ASB205	0.87 (22.0)	E22AT113	1.32 (33.5)
E22ASB206	0.87 (22.0)		

10250T and E34

Table 2-22. Approximate Enclosure Dimensions

Number of Elements	Surface Mounting Dimensions in Inches (mm)					Conduit Entrance
	Wide A	High B	Deep C	Mounting		
				D	E	

Cast

1	3.88 (98.6)	4.0 (101.6)	3.0 (76.3)	2.69 (68.3)	3.25 (82.6)	3/4
2	3.88 (98.6)	5.88 (149.4)	3.0 (76.3)	2.69 (68.3)	5.13 (130.3)	3/4
3	3.88 (98.6)	7.75 (196.9)	3.0 (76.3)	2.69 (68.3)	7.0 (177.8)	1
4	3.88 (98.6)	9.63 (244.6)	3.0 (76.3)	2.69 (68.3)	8.88 (225.6)	1

Polyester

1	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	①
2	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	
3	3.81 (96.8)	8.88 (225.6)	3.38 (85.9)	2.94 (74.7)	7.13 (181.1)	
4	3.81 (96.8)	11.13 (282.7)	3.38 (85.9)	2.94 (74.7)	9.38 (238.3)	

Stainless Steel

1	3.00 (76.2)	3.50 (88.9)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)	①
2	3.50 (88.9)	6.75 (171.5)	3.00 (76.2)	1.50 (38.1)	7.50 (190.5)	
3	3.50 (88.9)	9.00 (228.6)	3.00 (76.2)	1.50 (38.1)	9.00 (228.6)	
4	3.50 (88.9)	11.25 (285.8)	3.00 (76.2)	1.50 (38.1)	12.00 (304.8)	

① No conduit entrance holes provided. Drill as required.

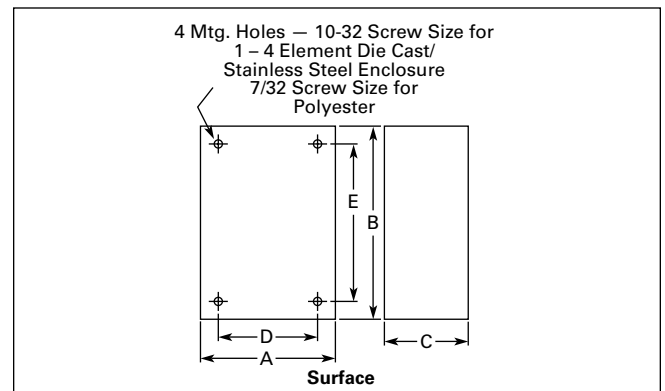


Figure 2-5. Approximate Enclosure Dimensions



10250H Series, Renewal Parts

Renewal Parts

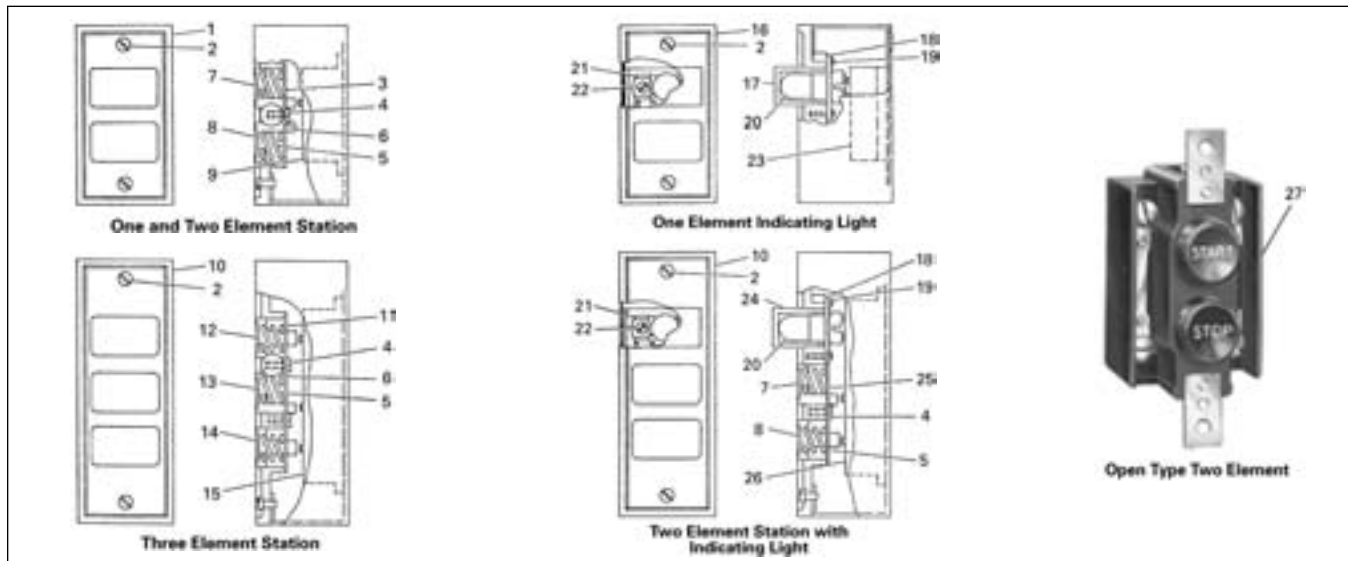


Figure 2-6. Type N Renewal Parts

Table 2-23. Assembled Stations — Type N Renewal Parts

Item No.	Description	No. Req.	Part Number
Type N — Square Buttons			
1	Cover 2 Element Single Element — Top Button Single Element — Bottom Button	1	49-3524 49-3524-2 49-3524-3
2	Cover Screw	2	11-2168
3	Pushbutton Support Bracket	1	79-6649
4	Pushbutton Support Bracket Screw	1	11-2090
5	Pushbutton Spring	2	69-2571
6	Disc (when used — 2 element assembly)	2	16-1960
7	Pushbutton — Top Position START/Green RAISE/Black FORWARD/Black OPEN/Black UP/Black Blank/Green	1	53-1169-3 53-1169-66 53-1169-7 53-1169-9 53-1169-11 53-1169
8	Pushbutton — Bottom Position STOP/Red Extended STOP/Red REVERSE/Black CLOSE/Black DOWN/Black LOWER/Black Blank/Red	1	53-1202-2 53-1202-5 53-1169-8 53-1169-10 53-1169-12 53-1169-6 53-1202
9	Pushbutton Element 1NO-1NC 2NO 1NO 1NC	1	86-2588 86-2588-2 86-2588-3 86-2588-4
10	Cover	1	49-3464
11	Pushbutton Support Bracket	1	79-6650
12	Pushbutton — Top Position FORWARD/Black UP/Black RAISE/Black OPEN/Black FAST/Black	1	53-1170-7 53-1170-4 53-1170-5 53-1170-9 53-1170-6

① Contact the Customer Support Centre for list prices.
1-800-268-3578

Item No.	Description	No. Req.	Part Number
Type N — Square Buttons (Continued)			
13	Pushbutton Middle Position REVERSE/Black DOWN/Black LOWER/Black CLOSE/Black SLOW/Black	1	53-1169-15 53-1169-18 53-1169-16 53-1169-17 53-1169-13
14	Pushbutton — Bottom Position STOP/Red	1	53-1201-2
15	Pushbutton Element 2NO-3NC	1	86-2593
16	Cover	1	49-3524-4
17	Lens Clear Red Amber	1	28-494 28-887-2 28-887-3
18	Shield	1	73-1337
19	Shield Screws	4	11-2012
20	Lamp (Neon NE48)	1	28-494
21	Lamp Receptacle	1	28-902
22	Lamp Receptacle Screw	1	911-330F1
23	Pilot Light Terminal Base	1	86-2586
24	Lens Clear Red Amber	1	28-887 28-887-2 28-887-3
25	Pushbutton Support Bracket	1	79-6650-2
26	Pushbutton Element 1NO-1NC	1	86-2594
Type N — Round Buttons			
Similar to 27	Pushbutton Assembly and Element for: 10250H289 10250H364 10250H685 10250H665 10250H671 10250H2738 10250H2740 10250H2741 10250H2742	1 1 1 1 1 1 1 1 1	10250H2538 86-353 86-353-8 86-353-8 86-353 86-353-3 86-356 86-356 86-356

April 2009

10250H Series, Renewal Parts

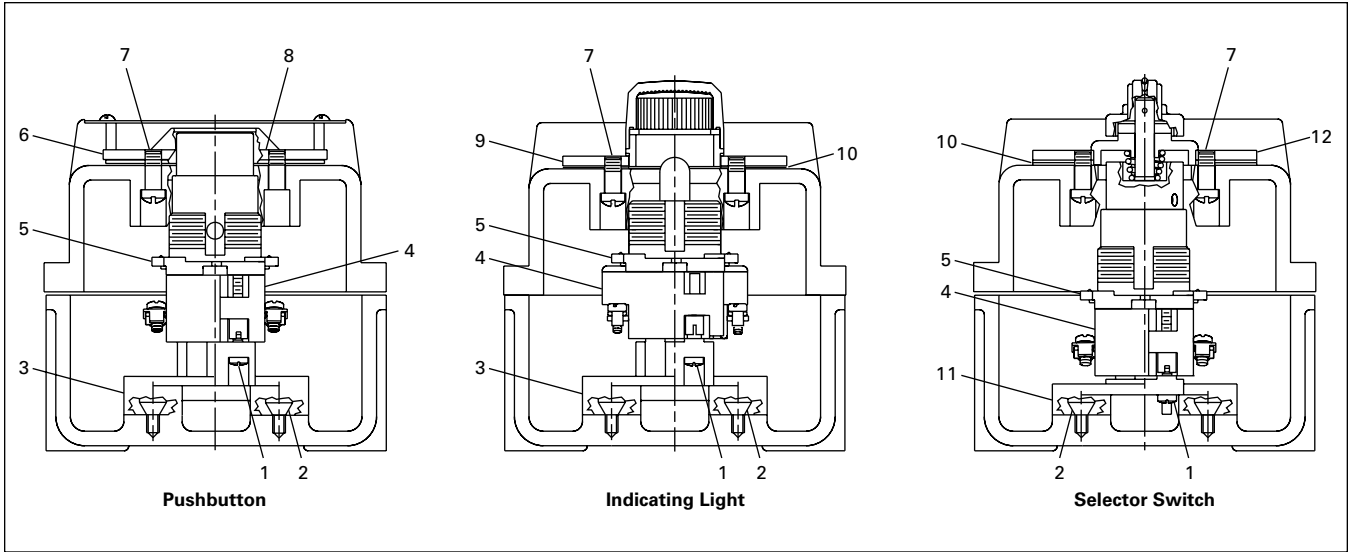


Figure 2-7. Type H Renewal Parts

Table 2-24. Assembled Stations — Type H Renewal Parts

Item No.	Description	No. Req.	Part Number
Type H — Assembled Stations			
1	Screw	2	11-4654
2	Screw	2	11-5719
3	Base	1	17-16560
4	Contact Blocks	See Page 2-115	
5	10250T Operator	See Pages 2-118 – 2-146	
6	Mounting Plate	1	17-19524

Item No.	Description	No. Req.	Part Number
Type H — Assembled Stations (Continued)			
7	Screw	4	11-953
8	Diaphragm	1	32-253-2
9	Mounting Plate	1	17-19522
10	Gasket	1	32-254
11	Base	1	17-16561
12	Mounting Plate	1	17-19523

① Contact the Customer Support Centre at 1-800-268-3578 for list prices.

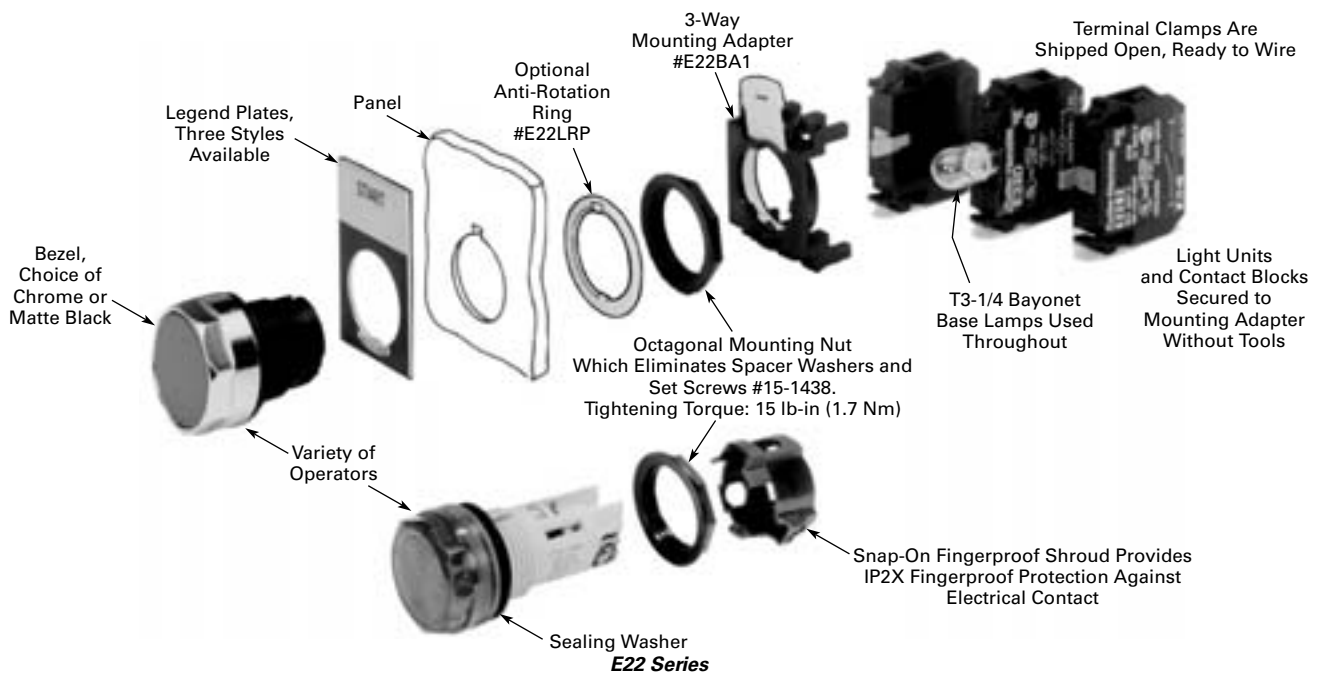
E22 and EM22 Series

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Product Description

Eaton's Cutler-Hammer® 22.5 mm Industrial Heavy-Duty Pushbutton line offers a wide array of functional, smartly styled illuminated and non-illuminated pushbuttons, selector switches, push-pulls, alternate action and twist-to-release operators. The complete line also includes transformer, full voltage, resistor, LED or neon light units.

E22 operators are available with either a traditional chrome or matte black front-of-panel appearance. The space-saving design and modular construction of the E22 line makes on-the-job assembly fast and simplifies the stocking of both components and complete devices.

Eaton's Cutler-Hammer EM22 Metal Series is a rugged line of metal construction 22.5 mm pushbutton devices. They are an extension of the industrially proven E22 Heavy-Duty Double Insulated 22.5 mm pushbutton family.

EM22 operators are heavy-duty zinc die-cast construction plated with a corrosion resistant chromate finish. Operators are complete with a very durable chrome plated metal bezel. Indicating light units in the EM22 Series feature smartly styled round lenses that enhance their appearance and brightness.

All EM22 operators are compatible with existing E22 contact blocks, light units, accessories and enclosures.

EM22 metal operators and indicating lights are grounded when mounted to metal panels through the toothed mounting nut. They are not grounded when mounted to plastic panels.

Features

E22 Operators:

- Heavy-duty oiltight construction
- Chrome metal or black nylon bezels
- Snap-lock contact block mounting

EM22 Operators:

- Heavy-duty zinc die-cast construction
- Metal mounting nut doubles as grounding and anti-rotation device
- Chrome-plated metal bezel (matte black not available)

Common E22 & EM22 Features:

- Reliability nibs on contact blocks
- Plain or notched hole mounting
- Direct opening action ⊖ normally closed contacts
- Fingerproof terminals

Benefits

Plastic Devices

- Modular construction makes assembly fast and simplifies stocking of components and complete devices
- Reliability nibs provide positive contact through light, medium or heavy loads
- Chrome finish and plastic construction are corrosion resistant

Metal Devices

- EM22 is backwards compatible with E22 operators
- Metal mounting nut cuts through painted surfaces to provide proper grounding
- Hands-free front of panel mounting reduces installation cost
- Mounting flexibility reduces installation cost, time and inventory
- Stands up well in corrosive environments
- E22 and EM22 compatibility lowers parts count and inventory requirements

Contact Block Operation

Linear make and break. All normally closed (NC) contacts are Direct Opening Action, i.e., NC contacts are physically forced open by direct linkage with the pushbutton operator in the unlikely event of contact weld.

The contact block contacts are provided with "Reliability Nibs." The precisely shaped point of the nib, coined on the silver contact alloy, penetrates dust, film oxide layers and other contaminants. This improves contact reliability even under dry circuit and fine dust conditions.

Logic level contact blocks are available for low power switching — minimum 1 mA @ 5V DC.

Standards and Certifications

- CE EN 60947-5-1
- UL 508 — File No. E131568
- CSA — File No. LR68551

Additional Certifications for Trigger Action E-Stop Devices

- UL Listed E-Stop Device — File No. E217948
- Machinery Safety Directive — EN418
- Semiconductor Manufacturing Equipment — SEMI S2-0200
- DEMKO Third Party Certification — Certificate Nos. 129648-01 and 129648-02

Technical Data and Specifications

Ingress Protection

- NEMA 1, 2, 3, 3R, 4, 4X, 12 and 13
- IEC IP65

Note: Ratings apply when mounted in enclosures with the same ratings.

Mechanical Endurance Ratings

- Frequency of operation
 - Pushbuttons – 6,000 operations/hr
 - Push-Pulls – 3,000 operations/hr.
 - Push-Push – 1,800 cycles/hr.
 - Selector Switches – 3,000 operations/hr.
 - Trigger-Action E-Stop – 360 cycles/hr.
 - Twist-to-Release – 1,200 cycles/hr
- Mechanical Life
 - Contact Blocks – 3 million operations
 - Pushbuttons – 5 million operations
 - Push-Pulls – 300,000 operations
 - Push-Push – 300,000 operations
 - Selector Switches – 500,000 operations
 - Trigger-Action E-Stop – 100,000 operations
 - Twist-to-Release – 300,000 operations
- Vibration (IEC 68-2 [BS 2011])
 - Vibration – 5g/0.7 mm peak to peak, 10 sweeps, 10 – 500 Hz
 - Shock – 30g, 18 ms
 - Bump – 25g, 6 ms for 1,000 cycle

Environmental Conditions

- Operating temperature: -4° to +140°F (-20° to +60°C)
- Storage temperature: -40° to +176°F (-40° to +80°C)
- Altitude: Up to 6562 feet (2000m)
- Pollution degree (IEC 947-1): 3
- Humidity: Maximum 95% RH @ 60°C

Terminal Markings

All rear of panel devices are marked with the circuit configuration per CENELEC 50013 standards.

Table 2-25. Contact Blocks

Circuit Configuration	Description	Plunger Colour
	1NC	Red
	1NO	Green
	1NO-1NC	White
	2NO	Green
	1NO Early Make	Black
	1NC Late Break	Grey

Table 2-26. Lights Units

Circuit Configuration	Description
	Full Voltage
	Resistor
	Transformer

- E22CB1, E22CB11, E22CB1E, E22B1 and E22B11 contact blocks are marked with Direct Opening Action (DOA) Symbol "⊖" per IEC 60947-5-1, Annex K and NEMA ICS 5, Part 6. For Mechanical Operating Parameters, see **Page 2-62**.

- E22CB1, E22CB11 and E22CB1E contact blocks will be marked as Suitable for Isolation per IEC 60947-5-1. \downarrow

Contact Block Terminal Clamps

- Clamp type: Self-lifting
- Screw type: Plus/minus, captive
- Wire range: 18 to 12 AWG (0.75 to 4.0 mm²)
- Fingerproof protection: IP2X
- Tightening torque: 7 lb-in (0.8 Nm)

Electrical Ratings

Table 2-27. Contact Block ^①

Description	Meet or Exceed NEMA Contact Rating Designations A600 and Q600							
	A600 (AC) Volts				Q600 (DC) Volts			
	120	240	480	600	125	250	440	600
Make and emergency interrupting capacity (Amp)	60	30	15	12	0.55	0.27	0.1	0.1
Normal load break (Amp)	6	3	1.5	1.2	0.55	0.27	0.1	0.1
Thermal current (Amp)	10	10	10	10	2.5	2.5	2.5	2.5

^① Ratings do not apply to rotary cam switches, see Ratings **Page 2-88**.

- A600, Q600 per UL 508
- AC15, DC13 per IEC 60947-5-1

Logic level contact blocks are UL A600, Q600 and IEC AC15, DC13 rated and also have a minimum rating of 1 mA @ 5V DC.

- Impulse withstand voltage (Uimp): 4 kV

Short Circuit Coordination to IEC/EN 60947-5-1

- Rated conditional short circuit current: 1 kA
- Fuse type: GE Power Controls TIA 10, Red Spot Type gG, 10A, 660V AC, 460V DC, BS88-2, IEC 60269-2-1

Electrical Life

- AC15 durability
 - 120V, 6A – 1 x 10⁶ operations
- DC13 durability
 - 24V, 4A – 0.15 x 10⁶ operations
 - 660V, 0.1A – 0.5 x 10⁶ operations

Material

- Housing, bezel, mounting rings: Glass filled nylon
- Metal bezels: Chrome plated brass
- Internal seal: Nitrile rubber
- Panel gasket: Nitrile rubber
- Illuminated lenses: Polycarbonate
- Buttons: Polyester or polycarbonate
- Contacts: Silver
- Terminals: Brass

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E22 and EM22 Series, Complete Devices — Pushbutton Units

Product Selection

Pushbutton Units

- Non-illuminated
- Plastic or Metal Operators

- Black or Chrome Bezel
- Flush, Extended or Mushroom Head Operators

Description

Listed below are commonly ordered complete pushbutton devices including

operator and contact block(s). These devices are shipped as unassembled components overpacked in a single bag. For instructions on how to order devices not listed below using a single composite Catalogue Number, refer to **Page 2-88**.

Table 2-28. Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Button Colour	Contact Block Circuit				
		NO	NC	NO-NC	2NO	2NC
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number

Plastic Operators — Black Bezel

	Flush — Momentary	Black Red Green	E22PB1A E22PB2A E22PB3A	E22PB1B E22PB2B E22PB3B	E22PB1C E22PB2C E22PB3C	E22PB1D E22PB2D E22PB3D	E22PB1E E22PB2E E22PB3E
	Extended — Momentary	Black Red Green	E22EB1A E22EB2A E22EB3A	E22EB1B E22EB2B E22EB3B	E22EB1C E22EB2C E22EB3C	E22EB1D E22EB2D E22EB3D	E22EB1E E22EB2E E22EB3E
	40 mm Mushroom — Momentary	Black Red Green	E22LB1A E22LB2A E22LB3A	E22LB1B E22LB2B E22LB3B	E22LB1C E22LB2C E22LB3C	E22LB1D E22LB2D E22LB3D	E22LB1E E22LB2E E22LB3E
	40 mm Twist-to-Release Mushroom — Latching	Black Red Green	E22LLB1A E22LLB2A E22LLB3A	E22LLB1B E22LLB2B E22LLB3B	E22LLB1C E22LLB2C E22LLB3C	E22LLB1D E22LLB2D E22LLB3D	E22LLB1E E22LLB2E E22LLB3E
	50 mm Jumbo Mushroom — Momentary	Black Red Green	E22JPB1A E22JPB2A E22JPB3A	E22JPB1B E22JPB2B E22JPB3B	E22JPB1C E22JPB2C E22JPB3C	E22JPB1D E22JPB2D E22JPB3D	E22JPB1E E22JPB2E E22JPB3E
	50 mm Jumbo Mushroom — Maintained	Red EMERGENCY STOP (Aluminum)	E22JLB2N8A ①	E22JLB2N8B ①	E22JLB2N8C ①	E22JLB2N8D ①	E22JLB2N8E ①

Plastic Operators — Chrome Bezel

	Flush — Momentary	Black Red Green	E22P1A E22P2A E22P3A	E22P1B E22P2B E22P3B	E22P1C E22P2C E22P3C	E22P1D E22P2D E22P3D	E22P1E E22P2E E22P3E
	Extended — Momentary	Black Red Green	E22E1A E22E2A E22E3A	E22E1B E22E2B E22E3B	E22E1C E22E2C E22E3C	E22E1D E22E2D E22E3D	E22E1E E22E2E E22E3E
	40 mm Mushroom — Momentary	Black Red Green	E22L1A E22L2A E22L3A	E22L1B E22L2B E22L3B	E22L1C E22L2C E22L3C	E22L1D E22L2D E22L3D	E22L1E E22L2E E22L3E
	40 mm Twist-to-Release Mushroom — Latching	Black Red Green	E22LL1A E22LL2A E22LL3A	E22LL1B E22LL2B E22LL3B	E22LL1C E22LL2C E22LL3C	E22LL1D E22LL2D E22LL3D	E22LL1E E22LL2E E22LL3E
	50 mm Jumbo Mushroom — Momentary	Black Red Green	E22JP1A E22JP2A E22JP3A	E22JP1B E22JP2B E22JP3B	E22JP1C E22JP2C E22JP3C	E22JP1D E22JP2D E22JP3D	E22JP1E E22JP2E E22JP3E
	50 mm Jumbo Mushroom — Maintained	Red EMERGENCY STOP (Aluminum)	E22JL2N8A ①	E22JL2N8B ①	E22JL2N8C ①	E22JL2N8D ①	E22JL2N8E ①

① Maintained operator. Anodized aluminum head is not suitable for use in ultraviolet light application.






Note: Dimensions are listed on **Page 2-82**.

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 Enclosures **Pages 2-80 – 2-81**
 Legend Plates **Pages 2-72 – 2-78**
 Commande d'étiquettes..... **Pages A-1**



E22 and EM22 Series, Complete Devices — Pushbutton Units

Table 2-28. Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13 (Continued)

	Button Colour	Contact Block Circuit				
		NO	NC	NO-NC	2NO	2NC
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
Metal Operators — Chrome Bezel						
	Flush — Momentary					
	Black	EM22P1A	② EM22P2B	EM22P1C	EM22P1D	② EM22P2E
	Red	EM22P2A	②	EM22P2C	② EM22P3D	②
Green	EM22P3A	②	EM22P3C			②
	Extended — Momentary					
	Red	EM22E2A	EM22E2B	EM22E2C	②	EM22E2E
	40 mm Mushroom — Momentary					
	Red	EM22L2A	EM22L2B	EM22L2C	②	EM22L2E
	40 mm Twist-to-Release Mushroom — Latching					
	Red	EM22LL2A	EM22LL2B	EM22LL2C	②	EM22LL2E
	50 mm Jumbo Mushroom — Momentary					
	Red	EM22JP2A	EM22JP2B	EM22JP2C	EM22JP2D	EM22JP2E
	50 mm Jumbo Mushroom — Maintained (Latching)					
Red	EM22JL2N8A ①	EM22JL2N8B ①	EM22JL2N8C ①	EM22JL2N8D ①	EM22JL2N8E ①	
EMERGENCY STOP (Aluminum)						

① Anodized aluminum head is not suitable for use in ultraviolet light application.

② See Page 2-88 for ordering other complete devices not shown.

Note: Dimensions are listed on Page 2-82.
















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 Legend Plates Pages 2-72 – 2-79
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E22 and EM22 Series, Pushbutton Components

Pushbutton Components

Table 2-29. Momentary Contact Pushbuttons, Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Will Accept Maximum of 3 Contact Blocks (6 Circuits) When Used with Supplied 3-Way Adapter and Optional Operator Plug.			Colour	E22 Series Plastic Operators		EM22 Series Metal Operators
				Black Bezel	Chrome Bezel	Chrome Bezel
				Catalogue Number	Catalogue Number	Catalogue Number
E22 Black	E22 Chrome	EM22 Chrome	25 mm Diameter Flush Button			
			Black Red Green Yellow White Blue Grey Orange	E22PB1 E22PB2 E22PB3 E22PB4 E22PB5 E22PB6 E22PB7 E22PB8	E22P1 E22P2 E22P3 E22P4 E22P5 E22P6 E22P7 E22P8	EM22P1 EM22P2 EM22P3 EM22P4 EM22P5 EM22P6 EM22P7 EM22P8
			25 mm Diameter Extended Button			
			Black Red Green Yellow White Blue Grey Orange	E22EB1 E22EB2 E22EB3 E22EB4 E22EB5 E22EB6 E22EB7 E22EB8	E22E1 E22E2 E22E3 E22E4 E22E5 E22E6 E22E7 E22E8	EM22E1 EM22E2 EM22E3 EM22E4 EM22E5 EM22E6 EM22E7 EM22E8
			25 mm Diameter with Full Shroud			
			Black Red Green Yellow White Blue Grey Orange	— — — — — — — —	E22PF1 E22PF2 E22PF3 E22PF4 E22PF5 E22PF6 E22PF7 E22PF8	EM22PF1 EM22PF2 EM22PF3 EM22PF4 EM22PF5 EM22PF6 EM22PF7 EM22PF8
			28 mm Dia. Mushroom Head Button			
			Black Red Green Yellow Blue	E22MB1 E22MB2 E22MB3 E22MB4 E22MB6	E22M1 E22M2 E22M3 E22M4 E22M6	EM22M1 EM22M2 EM22M3 EM22M4 EM22M6
			40 mm Dia. Mushroom Head Button			
			Black Red Green Yellow Blue	E22LB1 E22LB2 E22LB3 E22LB4 E22LB6	E22L1 E22L2 E22L3 E22L4 E22L6	EM22L1 EM22L2 EM22L3 EM22L4 EM22L6
			50 mm Dia. Mushroom Head Button — Plastic			
			Black Red Green Yellow Blue Red (Alum)	E22JPB1 E22JPB2 E22JPB3 E22JPB4 E22JPB6 E22JB2 ①	E22JP1 E22JP2 E22JP3 E22JP4 E22JP6 E22J2 ①	EM22JP1 EM22JP2 EM22JP3 EM22JP4 EM22JP6 EM22J2
			Red (Alum) Engraved EMERGENCY STOP	E22JB2N8 ①	E22J2N8 ①	EM22J2N8

① Anodized aluminum head is not suitable for use in ultraviolet light applications.

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.

Ordering Example — A complete Pushbutton Unit consists of the following:



Operator
See Above



Operator Plug
E22BA2 Required
if 3rd Contact
Block Is Used.
See Page 2-68



**Legend Plate or
Print Option**
See Pages
2-72 – 2-78



Mounting Adapter
E22BA1 (Supplied
with Operator).
For 5-Way Adapter,
See Page 2-70



**Contact
Blocks**
See Page 2-62

Suffix Codes Page 2-91
Commande d'étiquettes Pages A-1

E22 and EM22 Series, Complete Devices — Illuminated Pushbutton Units

Illuminated Momentary Pushbutton Units

- Plastic or Metal Operators
- Black or Chrome Bezel
- Extended Pushbuttons
- Full Voltage, Resistor or Transformer Light Units
- Plastic Lenses
- Metal Operators available with LED



Table 2-30. Plastic Illuminated Extended Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Description	Button Colour	NO	NC	NO-NC	2NO	2NC
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
Plastic Operators — Black Bezel						
	24V AC/DC Full Voltage					
	Red	E22TB2X4A	E22TB2X4B	E22TB2X4C	E22TB2X4D	E22TB2X4E
	Green	E22TB3X4A	E22TB3X4B	E22TB3X4C	E22TB3X4D	E22TB3X4E
	White	E22TB5X4A	E22TB5X4B	E22TB5X4C	E22TB5X4D	E22TB5X4E
	Blue	E22TB6X4A	E22TB6X4B	E22TB6X4C	E22TB6X4D	E22TB6X4E
	Amber	E22TB9X4A	E22TB9X4B	E22TB9X4C	E22TB9X4D	E22TB9X4E
Clear	E22TB0X4A	E22TB0X4B	E22TB0X4C	E22TB0X4D	E22TB0X4E	
	120V AC/DC Resistor Unit					
	Red	E22TB2X10A	E22TB2X10B	E22TB2X10C	E22TB2X10D	E22TB2X10E
	Green	E22TB3X10A	E22TB3X10B	E22TB3X10C	E22TB3X10D	E22TB3X10E
	White	E22TB5X10A	E22TB5X10B	E22TB5X10C	E22TB5X10D	E22TB5X10E
	Blue	E22TB6X10A	E22TB6X10B	E22TB6X10C	E22TB6X10D	E22TB6X10E
	Amber	E22TB9X10A	E22TB9X10B	E22TB9X10C	E22TB9X10D	E22TB9X10E
Clear	E22TB0X10A	E22TB0X10B	E22TB0X10C	E22TB0X10D	E22TB0X10E	
	120V Transformer AC — 50/60 Hz					
	Red	E22TB2X11A	E22TB2X11B	E22TB2X11C	E22TB2X11D	E22TB2X11E
	Green	E22TB3X11A	E22TB3X11B	E22TB3X11C	E22TB3X11D	E22TB3X11E
	White	E22TB5X11A	E22TB5X11B	E22TB5X11C	E22TB5X11D	E22TB5X11E
	Blue	E22TB6X11A	E22TB6X11B	E22TB6X11C	E22TB6X11D	E22TB6X11E
	Amber	E22TB9X11A	E22TB9X11B	E22TB9X11C	E22TB9X11D	E22TB9X11E
Clear	E22TB0X11A	E22TB0X11B	E22TB0X11C	E22TB0X11D	E22TB0X11E	
Plastic Operators — Chrome Bezel						
	24V AC/DC Full Voltage					
	Red	E22T2X4A	E22T2X4B	E22T2X4C	E22T2X4D	E22T2X4E
	Green	E22T3X4A	E22T3X4B	E22T3X4C	E22T3X4D	E22T3X4E
	White	E22T5X4A	E22T5X4B	E22T5X4C	E22T5X4D	E22T5X4E
	Blue	E22T6X4A	E22T6X4B	E22T6X4C	E22T6X4D	E22T6X4E
	Amber	E22T9X4A	E22T9X4B	E22T9X4C	E22T9X4D	E22T9X4E
Clear	E22T0X4A	E22T0X4B	E22T0X4C	E22T0X4D	E22T0X4E	
	120V AC/DC Resistor Unit					
	Red	E22T2X10A	E22T2X10B	E22T2X10C	E22T2X10D	E22T2X10E
	Green	E22T3X10A	E22T3X10B	E22T3X10C	E22T3X10D	E22T3X10E
	White	E22T5X10A	E22T5X10B	E22T5X10C	E22T5X10D	E22T5X10E
	Blue	E22T6X10A	E22T6X10B	E22T6X10C	E22T6X10D	E22T6X10E
	Amber	E22T9X10A	E22T9X10B	E22T9X10C	E22T9X10D	E22T9X10E
Clear	E22T0X10A	E22T0X10B	E22T0X10C	E22T0X10D	E22T0X10E	
	120V Transformer AC — 50/60 Hz					
	Red	E22T2X11A	E22T2X11B	E22T2X11C	E22T2X11D	E22T2X11E
	Green	E22T3X11A	E22T3X11B	E22T3X11C	E22T3X11D	E22T3X11E
	White	E22T5X11A	E22T5X11B	E22T5X11C	E22T5X11D	E22T5X11E
	Blue	E22T6X11A	E22T6X11B	E22T6X11C	E22T6X11D	E22T6X11E
	Amber	E22T9X11A	E22T9X11B	E22T9X11C	E22T9X11D	E22T9X11E
Clear	E22T0X11A	E22T0X11B	E22T0X11C	E22T0X11D	E22T0X11E	

Note: Dimensions are listed on Page 2-82.

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 Enclosures Pages 2-80 – 2-81
 Legend Plates Pages 2-72 – 2-78
 Commande d'étiquettes Pages A-1

Table 2-31. Metal Illuminated Extended Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Button Colour	NO Contact Block		NC Contact Block	
		Incandescent	LED	Incandescent	LED
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
Metal Operators — Chrome Bezel					
	24V AC/DC Full Voltage				
	Red	EM22T2X4A	EM22T2X40A	EM22T2X4B	EM22T2X40B
	Green	EM22T3X4A	EM22T3X41A	EM22T3X4B	EM22T3X41B
	White	EM22T5X4A	EM22T5X90A	EM22T5X4B	EM22T5X90B
	Blue	EM22T6X4A	EM22T6X52A	EM22T6X4B	EM22T6X52B
	Amber	EM22T9X4A	EM22T9X95A	EM22T9X4B	EM22T9X95B
	Clear	EM22T0X4A	EM22T0X90A	EM22T0X4B	EM22T0X90B
	120V AC Full Voltage				
	Red	—	EM22T2X43A	—	EM22T2X43B
	Green	—	EM22T3X44A	—	EM22T3X44B
	White	—	EM22T5X92A	—	EM22T5X92B
	Blue	—	EM22T6X61A	—	EM22T6X61B
	Amber	—	EM22T9X96A	—	EM22T9X96B
	Clear	—	EM22T0X92A	—	EM22T0X92B
	120V AC/DC Resistor Unit				
Red	EM22T2X10A	—	EM22T2X10B	—	
Green	EM22T3X10A	—	EM22T3X10B	—	
White	EM22T5X10A	—	EM22T5X10B	—	
Blue	EM22T6X10A	—	EM22T6X10B	—	
Amber	EM22T9X10A	—	EM22T9X10B	—	
Clear	EM22T0X10A	—	EM22T0X10B	—	
	120V AC Transformer — 50/60 Hz				
	Red	EM22T2X11A	EM22T2X433A	EM22T2X11B	EM22T2X433B
	Green	EM22T3X11A	EM22T3X444A	EM22T3X11B	EM22T3X444B
	White	EM22T5X11A	EM22T5X922A	EM22T5X11B	EM22T5X922B
	Blue	EM22T6X11A	EM22T6X611A	EM22T6X11B	EM22T6X611B
	Amber	EM22T9X11A	EM22T9X966A	EM22T9X11B	EM22T9X966B
	Clear	EM22T0X11A	EM22T0X922A	EM22T0X11B	EM22T0X922B

Note: Dimensions are listed on Page 2-82.

Accessories Pages 2-67 – 2-71
 Enclosures Pages 2-80 – 2-81
 Legend Plates Pages 2-72 – 2-79
 Commande d'étiquettes..... Pages A-1

E22 and EM22 Series, Illuminated Pushbutton Components

Illuminated Pushbutton Components

Table 2-32. Illuminated Pushbutton and PresTest Indicating Light Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Will Accept Maximum of 2 Contact Blocks (4 Circuits) When Used with Supplied 3-Way Adapter	Colour	E22 Series Plastic Operators		EM22 Series Metal Operators	
		Black Bezel	Chrome Bezel	Chrome Bezel	
		Catalogue Number	Catalogue Number	Catalogue Number	
	25 mm Diameter Flush Lens				
	Red	E22NB2	E22N2	EM22N2	
	Green	E22NB3	E22N3	EM22N3	
	Yellow	E22NB4	E22N4	EM22N4	
	White	E22NB5	E22N5	EM22N5	
	Blue	E22NB6	E22N6	EM22N6	
	Amber	E22NB9	E22N9	EM22N9	
	Clear	E22NB0	E22N0	EM22N0	
		25 mm Diameter Extended Lens			
		Red	E22TB2	E22T2	EM22T2
Green		E22TB3	E22T3	EM22T3	
Yellow		E22TB4	E22T4	EM22T4	
White		E22TB5	E22T5	EM22T5	
Blue		E22TB6	E22T6	EM22T6	
Amber		E22TB9	E22T9	EM22T9	
Clear		E22TB0	E22T0	EM22T0	
		25 mm Dia. Extended ^① Lens with Shroud			
		Red	—	E22TX2	EM22TX2
	Green	—	E22TX3	EM22TX3	
	Yellow	—	E22TX4	EM22TX4	
	White	—	E22TX5	EM22TX5	
	Blue	—	E22TX6	EM22TX6	
	Amber	—	E22TX9	EM22TX9	
	Clear	—	E22TX0	EM22TX0	

^① If a Flush Lens type is required instead of Extended, substitute **N** for **T** in listed Catalogue Number.
Example: E22NX2 — Red flush illuminated pushbutton with full shroud. Chrome version only.

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

Accessories	Pages 2-67 – 2-71
Contact Blocks	Page 2-62
Enclosures	Pages 2-80 – 2-81
Legend Plates	Pages 2-72 – 2-78
Light Units	Pages 2-63 – 2-64
Suffix Codes	Page 2-91
Commande d'étiquettes	Pages A-1

Alternate-Action (Push-Push) Pushbutton Units

- Non-illuminated or Illuminated
- Plastic or Metal Operators
- Black or Chrome Bezel
- Flush or Extended Operators



Description
Listed below are commonly ordered complete pushbutton devices including operator and contact block(s). These devices are shipped as unassembled

components overpacked in a single bag. For instructions on how to order devices not listed below using a single composite Catalogue Number, refer to **Page 2-88**.



Table 2-33. E22 and EM22 Series Non-illuminated Flush and Extended Alternate-Action Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Button Colour	Contact Block Circuit				
		NO	NC	NO-NC	2NO	2NC
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number



E22 Series — Plastic Operators — Black Bezel

Flush						
	Black	E22PPB1A	E22PPB1B	E22PPB1C	E22PPB1D	E22PPB1E
	White	E22PPB5A	E22PPB5B	E22PPB5C	E22PPB5D	E22PPB5E
	Grey	E22PPB7A	E22PPB7B	E22PPB7C	E22PPB7D	E22PPB7E
Extended						
	Black	E22EPB1A	E22EPB1B	E22EPB1C	E22EPB1D	E22EPB1E
	White	E22EPB5A	E22EPB5B	E22EPB5C	E22EPB5D	E22EPB5E
	Grey	E22EPB7A	E22EPB7B	E22EPB7C	E22EPB7D	E22EPB7E

E22 Series — Plastic Operators — Chrome Bezel

Flush						
	Black	E22PP1A	E22PP1B	E22PP1C	E22PP1D	E22PP1E
	White	E22PP5A	E22PP5B	E22PP5C	E22PP5D	E22PP5E
	Grey	E22PP7A	E22PP7B	E22PP7C	E22PP7D	E22PP7E
Extended						
	Black	E22EP1A	E22EP1B	E22EP1C	E22EP1D	E22EP1E
	White	E22EP5A	E22EP5B	E22EP5C	E22EP5D	E22EP5E
	Grey	E22EP7A	E22EP7B	E22EP7C	E22EP7D	E22EP7E

EM22 Series — Metal Operators — Chrome Bezel

Flush						
	Black	EM22PP1A	EM22PP1B	EM22PP1C	EM22PP1D	EM22PP1E
	White	EM22PP5A	EM22PP5B	EM22PP5C	EM22PP5D	EM22PP5E
	Grey	EM22PP7A	EM22PP7B	EM22PP7C	EM22PP7D	EM22PP7E
Extended						
	Black	EM22EP1A	EM22EP1B	EM22EP1C	EM22EP1D	EM22EP1E
	White	EM22EP5A	EM22EP5B	EM22EP5C	EM22EP5D	EM22EP5E
	Grey	EM22EP7A	EM22EP7B	EM22EP7C	EM22EP7D	EM22EP7E

Note: Dimensions are listed on **Page 2-82**.

Note: In order to comply with NFPA 79 and IEC 60204-1 requirements:

The colours black, white or grey shall be used for Push-Push operators which act alternately as START/ON and STOP/OFF pushbuttons.







Push-Push operators shall only be used for functions which can not result in a hazardous condition.

IEC 60204-1 recommends that Push-Push operators acting alternately as START/ON and STOP/OFF pushbuttons be marked with the printed legend N124.

Accessories **Pages 2-67 – 2-71**
 Enclosures **Pages 2-80 – 2-81**
 Legend Plates **Pages 2-72 – 2-78**
 Commande d'étiquettes..... **Pages A-1**

E22 and EM22 Series, Complete Devices — Push-Push Units

Table 2-34. E22 and EM22 Series Illuminated Flush Alternate-Action Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Button Colour	Contact Block Circuit				
		NO	NC	NO-NC	2NO	2NC
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
E22 Series — Plastic Operators — Chrome Bezel						
24V AC/DC Full Voltage, Flush						
	White Clear	E22NP5X4A E22NP0X4A	E22NP5X4B E22NP0X4B	E22NP5X4C E22NP0X4C	E22NP5X4D E22NP0X4D	E22NP5X4E E22NP0X4E
120V AC/DC Resistor, Flush						
	White Clear	E22NP5X10A E22NP0X10A	E22NP5X10B E22NP0X10B	E22NP5X10C E22NP0X10C	E22NP5X10D E22NP0X10D	E22NP5X10E E22NP0X10E
120V AC Transformer — 50/60 Hz, Flush						
	White Clear	E22NP5X11A E22NP0X11A	E22NP5X11B E22NP0X11B	E22NP5X11C E22NP0X11C	E22NP5X11D E22NP0X11D	E22NP5X11E E22NP0X11E
EM22 Series — Metal Operators — Chrome Bezel						
24V AC/DC Full Voltage Unit, Flush						
	White Clear	EM22NP5X4A EM22NP0X4A	EM22NP5X4B EM22NP0X4B	EM22NP5X4C EM22NP0X4C	EM22NP5X4D EM22NP0X4D	EM22NP5X4E EM22NP0X4E
120V AC/DC Resistor Unit, Flush						
	White Clear	EM22NP5X10A EM22NP0X10A	EM22NP5X10B EM22NP0X10B	EM22NP5X10C EM22NP0X10C	EM22NP5X10D EM22NP0X10D	EM22NP5X10E EM22NP0X10E
120V AC Transformer Unit, Flush						
	White Clear	EM22NP5X11A EM22NP0X11A	EM22NP5X11B EM22NP0X11B	EM22NP5X11C EM22NP0X11C	EM22NP5X11D EM22NP0X11D	EM22NP5X11E EM22NP0X11E

Note: Dimensions are listed on **Page 2-82**.

Note: In order to comply with NFPA 79 and IEC 60204-1 requirements:


White shall be used for Illuminated Push-Push operators which act alternately as START/ON and STOP/OFF pushbuttons.

Push-Push operators shall only be used for functions which can not result in a hazardous condition.

IEC 60204-1 recommends that Push-Push operators acting alternately as START/ON and STOP/OFF pushbuttons be marked with the printed legend N124.

Accessories	Pages 2-67 – 2-71
Enclosures	Pages 2-80 – 2-81
Legend Plates	Pages 2-72 – 2-78
Commande d'étiquettes	Pages A-1

Table 2-35. E22 and EM22 Series Illuminated Bezel Flush Assembled Push-Push Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Button Colour	Contact Block Circuit				
		NO	NC	NO-NC	2NO	2NC
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
E22 Series — Plastic Operators — Chrome Bezel						
	24V AC/DC Full Voltage, Flush, Illuminated Bezel					
	Red	E22TP2X4A	E22TP2X4B	E22TP2X4C	E22TP2X4D	E22TP2X4E
	Green	E22TP3X4A	E22TP3X4B	E22TP3X4C	E22TP3X4D	E22TP3X4E
	White	E22TP5X4A	E22TP5X4B	E22TP5X4C	E22TP5X4D	E22TP5X4E
	Blue	E22TP6X4A	E22TP6X4B	E22TP6X4C	E22TP6X4D	E22TP6X4E
	Amber	E22TP9X4A	E22TP9X4B	E22TP9X4C	E22TP9X4D	E22TP9X4E
	Clear	E22TP0X4A	E22TP0X4B	E22TP0X4C	E22TP0X4D	E22TP0X4E
	120V AC/DC Resistor, Flush, Illuminated Bezel					
	Red	E22TP2X10A	E22TP2X10B	E22TP2X10C	E22TP2X10D	E22TP2X10E
	Green	E22TP3X10A	E22TP3X10B	E22TP3X10C	E22TP3X10D	E22TP3X10E
	White	E22TP5X10A	E22TP5X10B	E22TP5X10C	E22TP5X10D	E22TP5X10E
	Blue	E22TP6X10A	E22TP6X10B	E22TP6X10C	E22TP6X10D	E22TP6X10E
	Amber	E22TP9X10A	E22TP9X10B	E22TP9X10C	E22TP9X10D	E22TP9X10E
	Clear	E22TP0X10A	E22TP0X10B	E22TP0X10C	E22TP0X10D	E22TP0X10E
	120V AC Transformer — 50/60 Hz, Flush, Illuminated Bezel					
	Red	E22TP2X11A	E22TP2X11B	E22TP2X11C	E22TP2X11D	E22TP2X11E
	Green	E22TP3X11A	E22TP3X11B	E22TP3X11C	E22TP3X11D	E22TP3X11E
	White	E22TP5X11A	E22TP5X11B	E22TP5X11C	E22TP5X11D	E22TP5X11E
	Blue	E22TP6X11A	E22TP6X11B	E22TP6X11C	E22TP6X11D	E22TP6X11E
	Amber	E22TP9X11A	E22TP9X11B	E22TP9X11C	E22TP9X11D	E22TP9X11E
	Clear	E22TP0X11A	E22TP0X11B	E22TP0X11C	E22TP0X11D	E22TP0X11E
EM22 Series — Metal Operators — Chrome Bezel						
	24V AC/DC Full Voltage Unit, Flush, Illuminated Bezel					
	Red	EM22TP2X4A	EM22TP2X4B	EM22TP2X4C	EM22TP2X4D	EM22TP2X4E
	Green	EM22TP3X4A	EM22TP3X4B	EM22TP3X4C	EM22TP3X4D	EM22TP3X4E
	White	EM22TP5X4A	EM22TP5X4B	EM22TP5X4C	EM22TP5X4D	EM22TP5X4E
	Blue	EM22TP6X4A	EM22TP6X4B	EM22TP6X4C	EM22TP6X4D	EM22TP6X4E
	Amber	EM22TP9X4A	EM22TP9X4B	EM22TP9X4C	EM22TP9X4D	EM22TP9X4E
	Clear	EM22TP0X4A	EM22TP0X4B	EM22TP0X4C	EM22TP0X4D	EM22TP0X4E
	120V AC/DC Resistor Unit, Flush, Illuminated Bezel					
	Red	EM22TP2X10A	EM22TP2X10B	EM22TP2X10C	EM22TP2X10D	EM22TP2X10E
	Green	EM22TP3X10A	EM22TP3X10B	EM22TP3X10C	EM22TP3X10D	EM22TP3X10E
	White	EM22TP5X10A	EM22TP5X10B	EM22TP5X10C	EM22TP5X10D	EM22TP5X10E
	Blue	EM22TP6X10A	EM22TP6X10B	EM22TP6X10C	EM22TP6X10D	EM22TP6X10E
	Amber	EM22TP9X10A	EM22TP9X10B	EM22TP9X10C	EM22TP9X10D	EM22TP9X10E
	Clear	EM22TP0X10A	EM22TP0X10B	EM22TP0X10C	EM22TP0X10D	EM22TP0X10E
	120V AC Transformer Unit, Flush, Illuminated Bezel					
	Red	EM22TP2X11A	EM22TP2X11B	EM22TP2X11C	EM22TP2X11D	EM22TP2X11E
	Green	EM22TP3X11A	EM22TP3X11B	EM22TP3X11C	EM22TP3X11D	EM22TP3X11E
	White	EM22TP5X11A	EM22TP5X11B	EM22TP5X11C	EM22TP5X11D	EM22TP5X11E
	Blue	EM22TP6X11A	EM22TP6X11B	EM22TP6X11C	EM22TP6X11D	EM22TP6X11E
	Amber	EM22TP9X11A	EM22TP9X11B	EM22TP9X11C	EM22TP9X11D	EM22TP9X11E
	Clear	EM22TP0X11A	EM22TP0X11B	EM22TP0X11C	EM22TP0X11D	EM22TP0X11E

Note: Dimensions are listed on **Page 2-82**.

Note: In order to comply with NFPA 79 and IEC 60204-1 requirements:

The colours black, white or grey shall be used for Push-Push operators which act alternately as START/ON and STOP/OFF pushbuttons. White shall be used for illuminated Push-Push operators.

Push-Push operators shall only be used for functions which can not result in a hazardous condition.

IEC 60204-1 recommends that Push-Push operators acting alternately as START/ON and STOP/OFF pushbuttons be marked with the printed legend N124.

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E22 and EM22 Series, Push-Push Components

Alternate Action (Push-Push) Components

Non-illuminated and Illuminated Push-Push Operators

Note: Will accept a maximum of 2 contact blocks when used with supplied 3-way adapter, 5-way mounting adapters are not to be used.

Table 2-36. Push-Push Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	E22 Series — Plastic Operators		EM22 Series — Metal Operators
	Black Bezel	Chrome Bezel	Chrome Bezel
Flush, Non-illuminated			
			
Colour	Catalogue Number	Catalogue Number	Catalogue Number
Black White Grey	E22PPB1 E22PPB5 E22PPB7	E22PP1 E22PP5 E22PP7	EM22PP1 EM22PP5 EM22PP7
Extended, Non-illuminated			
			
Colour	Catalogue Number	Catalogue Number	Catalogue Number
Black White Grey	E22EPB1 E22EPB5 E22EPB7	E22EP1 E22EP5 E22EP7	EM22EP1 EM22EP5 EM22EP7
Flush, Illuminated			
			
Colour	Catalogue Number	Catalogue Number	Catalogue Number
White Clear Red Green Blue Amber	E22NPB5 E22NPB0 E22NPB2 E22NPB3 E22NPB6 E22NPB9	E22NP5 E22NP0 E22NP2 E22NP3 E22NP6 E22NP9	EM22NP5 EM22NP0 EM22NP2 EM22NP3 EM22NP6 EM22NP9
Flush, Illuminated with Illuminated Bezel			
Colour	Catalogue Number	Catalogue Number	Catalogue Number
White Clear Red Green Blue Amber	— — — — — —	E22TP5 E22TP0 E22TP2 E22TP3 E22TP6 E22TP9	EM22TP5 EM22TP0 EM22TP2 EM22TP3 EM22TP6 EM22TP9

Note: In order to comply with NFPA 79 and IEC 60204-1 requirements:

The colours black, white or grey shall be used for Push-Push operators which act alternately as START/ON and STOP/OFF pushbuttons. White shall be used for illuminated Push-Push operators.

Push-Push operators shall only be used for functions which cannot result in a hazardous condition.

IEC 60204-1 recommends that Push-Push operators acting alternately as START/ON and STOP/OFF pushbuttons be marked with the IEC symbol for Push-Push pushbuttons. To order with legend, add Suffix **N124** to operator Catalogue Number and add \$2.10 to list price. Example: E22PPB1**N124**

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

Accessories	Pages 2-67 – 2-71
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Alternate Action (Push-Push) Components (Continued)

Contact Block Selection/Application

Non-illuminated Push-Push operators will accept a maximum of 2 contact blocks (singles or duals). 5-way mounting adapters are not suitable with Push-Push operators. Illuminated Push-Push operators will accept a maximum of 2 contact blocks (singles or duals) and one light unit.

Table 2-37. Push-Push Operators

Contact Block Required		Circuit	Circuit Operation ①	
Suffix Code	Catalogue Number		Push-ON	Push-OFF
B	E22B1	1NC	O	X
A	E22B2	1NO	X	O
W	E22B11	1NO-1NC	X O	O X
V	E22B20	2NO	X X	O O

① X = Closed Circuit

② O = Open Circuit

Note: Add Contact Block Suffix Code from tables above to operator Catalogue Number to order as a complete device. Example: E22EP1B = chrome bezel, Black button Push-Push with 1NC contact block.

Accessories **Pages 2-67 – 2-71**
 Enclosures **Pages 2-80 – 2-81**
 Legend Plates..... **Pages 2-72 – 2-78**
 Light Units **Pages 2-63 – 2-64**
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E22 Series, Complete Devices — Maintained Emergency Stop Pushbutton Units

Trigger Action Emergency Stop Pushbutton Units — EN 418 Compliant

The European Machinery Safety Directive EN 418 requires all emergency OFF devices to be self-latching types and to have positive (direct) opening operation. Devices have to be manually reset. Actuators shall be mushroom head type and coloured RED. The background immediately around the device actuator should be coloured YELLOW. See **Page 2-35** for yellow guard.

The new E22 trigger action operators in conjunction with yellow nameplates and DOA (Direct Opening Action) con-

tact blocks are fully compliant with this safety directive.





Features

- Safety interlock against inadvertent operation
- Stop command and latching occur simultaneously
- Contacts cannot be “teased” open
- Direct Opening Action (DOA) contact blocks
- Resetable by rotation of actuator

Periodic Inspection

Industrial control equipment should be periodically inspected. Eaton recommends inspection of Emergency Stop devices for proper mechanical operation after every 500 hours of elapsed time. See National Electrical Manufacturers Association (NEMA) Standard No. ICS 1.3, *Preventive Maintenance of Industrial Control and Systems Equipment*, for guidelines in setting up a maintenance program.

Table 2-38. Trigger Action Emergency OFF Switch Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13


Action	Colour	Legend/ Engraving	Contact Block Circuit			
			1NC	2NC	1NC-1NO	2NC-1NO
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
40 mm Trigger Action Twist-to-Release ①						
	Red	 (Red)	E22LTA2QB	E22LTA2QE	E22LTA2QW	E22LTA2QWB
40 mm Trigger Action Twist-to-Release EMO (Emergency Machine OFF) ②						
	Red	 (White) ③	E22LTA2N123QB	E22LTA2N123QE	E22LTA2N123QW	E22LTA2N123QWB

① Third party certified by DEMKO. For specification drawing, request A70-8530 from the Customer Support Centre — call 1-800-268-3578.

② Third party certified by DEMKO and GS3 to SEMI S2-0200 specifications. For specification drawing, request A70-8508 from the Customer Support Centre — call 1-800-268-3578.

③ EMO (Emergency Machine OFF) marking per SEMI S2 requirement.

Table 2-39. Two-Position Push-Pull Emergency Stop Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Action	Colour	Legend/ Engraving	Contact Block Circuit		
			1NC	2NC	1NC-1NO
			Catalogue Number	Catalogue Number	Catalogue Number
40 mm Mushroom					
	Red	None	E22LPB2B	E22LPB2E	E22LPB2C
	Red	④	E22LPB2N125B	E22LPB2N125E	E22LPB2N125C

④ IEC Symbol for Emergency Stop.












↻ Direct Opening Action (DOA) for IEC 60947-5-1 (Annex K) and NEMA ICS 5 (Part 6) Compliance

Table 2-40. Mechanical Operating Parameters of Operators with E22CB1 and E22CB11 (NC Contacts Only)

DOA Operating Parameters	Latching Trigger Action E-Stop		2-Position Push-Pull	
	E-Stop + E22CB1	E-Stop + E22CB11	2-Pos. Push-Pull + E22CB1	2-Pos. Push-Pull + E22CB11
Min. Travel to Open Contact — Inches (mm)	0.24 (6.1)	0.24 (6.1)	0.08 (2.1)	0.08 (2.1)
Min. Force to Open Contact — lb (N)	5.00 (22.24)	5.00 (22.24)	0	0
Total Travel — Inches (mm)	0.29 (7.4)	0.29 (7.4)	0.23 (5.8)	0.23 (5.8)

Emergency Stop Components

Table 2-41. Standard Emergency Stop and Emergency OFF Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13


All Shown with Chrome Bezel	Action	Colour	Button Diameter/ Material	Legend/ Engraving	Plastic — Black Bezel	Plastic — Chrome Bezel
					Catalogue Number	Catalogue Number
Maximum of 2 Contact Blocks (4 Circuits) When Used with Supplied 3-Way Adapter (Unless Otherwise Noted)						
	Maintained Trigger Action Twist-to-Release	Red	40 mm/Plastic		E22LTA2 ①	—
	Maintained Trigger Action Twist-to-Release	Red	40 mm/Plastic	EMO	E22LTA2N123 ①	—
	Momentary ③	Red	40 mm/Plastic		E22LB2	E22L2
			50 mm/Plastic		E22JPB2	E22JP2
			50 mm/Alum.		E22JB2	E22J2
				EMERG. STOP	E22JB2N8	E22J2N8
	Maintained 2-Position Push-Pull ③	Red	40 mm/Plastic		E22LPB2 ①	E22LP2 ①
	Maintained 2-Position Push-Pull ③	Red	50 mm/Plastic		E22JPLB2 ①	E22JPL2 ①
			50 mm/Alum.		E22JLB2 ①	E22JL2 ①
				EMERG. STOP	E22JLB2N8 ①	E22JL2N8 ①
	Maintained 2-Position Push-Pull ③	Red	40 mm/Plastic		E22EDB2 ①	E22ED2 ①
				EMERG. STOP	E22EDB2N8 ①	E22ED2N8 ①
				EMERG. STOP	E22EDB2N796 ①②	E22ED2N796 ①②
	Maintained 2-Position Push-Pull ③	Red	40 mm/Plastic Illuminated		E22GDB2 ①	E22GD2 ①
				EMERG. STOP	E22GDB2N8 ①	E22GD2N8 ①
				EMERG. STOP	E22GDB2N796 ①②	E22GD2N796 ①②
	Maintained Twist-to-Release	Red	40 mm/Plastic	 (White)	E22LLB2	E22LL2
				 EMERGENCY OFF (White)	E22LLB2N886	E22LL2N886
	Maintained — Key Release	Red	40 mm/Plastic		E22GB2	E22G2

① Compliant with EN418 Machinery Safety Directive.

② Yellow field — red letters.

③ Maximum of 3 contact blocks allowable (6 circuits) when optional operator plug is used.

Table 2-42. EN418 Compliant Safety Yellow Guard

	Description	Colour	Catalogue Number
	Mushroom Guard for 40 mm Trigger Action Switch — To be used with E22LTA2 and E22LTA2N123 operators.	Safety Yellow	E22MGTA

Periodic Inspection

Industrial control equipment should be periodically inspected. Eaton recommends inspection of Emergency Stop devices for proper mechanical operation after every 500 hours of elapsed time. See National Electrical Manufacturers Association (NEMA) Standard No. ICS 1.3, *Preventive Maintenance of*
















Industrial Control and Systems Equipment, for guidelines in setting up a maintenance program.

Contact Blocks **Page 2-62**
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E22 and EM22 Series, Twist-to-Release, Push-Pull and Key Release Components

Twist-to-Release, Push-Pull and Key Release Components

Table 2-43. Maintained Contact Mushroom Head Operators, Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Will Accept Maximum of 2 Contact Blocks (4 Circuits) When Used with Supplied 3-Way Adapter.	E22 Series Plastic Operators			EM22 Series Metal Operators	
	Colour	Black Bezel	Chrome Bezel	Colour	Chrome Bezel
		Catalogue Number	Catalogue Number		Catalogue Number
  	Twist-to-Release — 28 mm Diameter Button (Push to Latch — Twist to Release)				
	Black Red Green Yellow Blue	E22MLB1 E22MLB2 E22MLB3 E22MLB4 E22MLB6	E22ML1 E22ML2 E22ML3 E22ML4 E22ML6	Red Black Green Yellow Blue	EM22ML2 EM22ML1 EM22ML3 EM22ML4 EM22ML6
  	Twist-to-Release — 40 mm Diameter Button (Push to Latch — Twist to Release)				
	Black Red Green Yellow Blue	E22LLB1 E22LLB2 E22LLB3 E22LLB4 E22LLB6	E22LL1 E22LL2 E22LL3 E22LL4 E22LL6	Red Black Green Yellow Blue	EM22LL2 EM22LL1 EM22LL3 EM22LL4 EM22LL6
  	Push-Pull — 40 mm Diameter Button (Push to Latch — Pull to Release)				
	Black Red Green Yellow Blue	E22LPB1 E22LPB2 E22LPB3 E22LPB4 E22LPB6	E22LP1 E22LP2 E22LP3 E22LP4 E22LP6	Red Black Green Yellow White Blue Grey Orange	EM22LP2 EM22LP1 EM22LP3 EM22LP4 EM22LP5 EM22LP6 EM22LP7 EM22LP8
  	Push-Pull — 50 mm Diameter Button (Push to Latch — Pull to Release)				
	Black Red Green Yellow Blue Red (Alum)	E22JPLB1 E22JPLB2 E22JPLB3 E22JPLB4 E22JPLB6 E22JLB2 ①	E22JPL1 E22JPL2 E22JPL3 E22JPL4 E22JPL6 E22JL2 ①	Red Black Green Yellow White Blue Grey Orange Red (Alum)	EM22JPL2 EM22JPL1 EM22JPL3 EM22JPL4 EM22JPL5 EM22JPL6 EM22JPL7 EM22JPL8 EM22JL2
	Red (Alum) EMERGENCY STOP				
		E22JLB2N8 ①	E22JL2N8 ①		EM22JL2N8
  	Key Release — 40 mm Diameter Button (Push to Latch — Turn Key to Release) ②				
	Black Red Green	E22GB1 E22GB2 E22GB3	E22G1 E22G2 E22G3	Red Black Green	EM22G2 EM22G1 EM22G3

① Anodized aluminum head — not suitable for ultraviolet light applications.

② For legend plates, use oversize plates, Catalogue Numbers E22VA1, VA2 or VA8 listed on Page 2-67.

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.

Special Locks

All key operated devices listed above are supplied with a standard lock and key — Key Reference Number 92239. For special locks, please refer to your Eaton sales office.

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E22 and EM22 Series, Complete Devices — Indicating Light Units, Modular

Indicating Light Units — Modular

- Standard and PresTest Types
- Plastic or Metal Operators
- Full Voltage LED Light Units or
- Full Voltage, Resistor or Transformer Incandescent Light Units

- Plastic Lenses




PresTest — This device incorporates a press-to-test feature whereby depressing the lens disconnects the light from the source being monitored and connects

the lamp to a continuously energized circuit for immediate test for a faulty lamp.




Table 2-44. Indicating and PresTest Light Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Colour	Indicating Light		PresTest
		LED	Incandescent	Incandescent
		Catalogue Number	Catalogue Number	Catalogue Number

Plastic Operators

	24V AC/DC Full Voltage			
	Red	E22H2X40	E22H2X4	E22T2X20
	Green	E22H3X41	E22H3X4	E22T3X20
	White	E22H5X90	E22H5X4	E22T5X20
	Blue	E22H6X52	E22H6X4	E22T6X20
	Amber	E22H9X95	E22H9X4	E22T9X20
Clear	E22H0X90	E22H0X4	E22T0X20	
	120V AC Full Voltage		120V AC/DC Resistor	
	Red	E22H2X43	E22H2X10	E22T2X26
	Green	E22H3X44	E22H3X10	E22T3X26
	White	E22H5X92	E22H5X10	E22T5X26
	Blue	E22H6X61	E22H6X10	E22T6X26
	Amber	E22H9X96	E22H9X10	E22T9X26
Clear	E22H0X92	E22H0X10	E22T0X26	
	120V AC Transformer			
	Red	—	E22H2X11	E22T2X27
	Green	—	E22H3X11	E22T3X27
	White	—	E22H5X11	E22T5X27
	Blue	—	E22H6X11	E22T6X27
	Amber	—	E22H9X11	E22T9X27
Clear	—	E22H0X11	E22T0X27	

Metal Operators

	24V AC/DC Full Voltage			
	Red	EM22H2X40	EM22H2X4	EM22T2X20
	Green	EM22H3X41	EM22H3X4	EM22T3X20
	White	EM22H5X90	EM22H5X4	EM22T5X20
	Blue	EM22H6X52	EM22H6X4	EM22T6X20
	Amber	EM22H9X95	EM22H9X4	EM22T9X20
Clear	EM22H0X90	EM22H0X4	EM22T0X20	
	120V AC Full Voltage		120V AC/DC Resistor Unit	
	Red	EM22H2X43	EM22H2X8	EM22T2X26
	Green	EM22H3X44	EM22H3X8	EM22T3X26
	White	EM22H5X92	EM22H5X8	EM22T5X26
	Blue	EM22H6X61	EM22H6X8	EM22T6X26
	Amber	EM22H9X96	EM22H9X8	EM22T9X26
Clear	EM22H0X92	EM22H0X8	EM22T0X26	
	120V AC Transformer — 50/60 Hz			
	Red	EM22H2X433	EM22H2X11	EM22T2X27
	Green	EM22H3X444	EM22H3X11	EM22T3X27
	White	EM22H5X922	EM22H5X11	EM22T5X27
	Blue	EM22H6X611	EM22H6X11	EM22T6X27
	Amber	EM22H9X966	EM22H9X11	EM22T9X27
Clear	EM22H0X922	EM22H0X11	EM22T0X27	

Note: Dimensions are listed on **Page 2-82**.


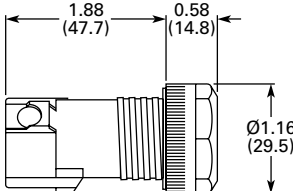
Accessories **Pages 2-67 – 2-71**
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E22 and EM22 Series, Complete Devices — Indicating Light Units, One-Piece LED

Indicating Light Units — One-Piece LED


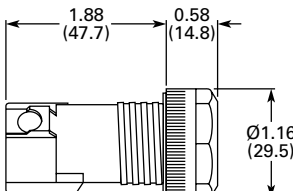
- One-Piece Body Style
- Plastic Operators
- Full Voltage LEDs
- Cluster-Style Integrated LED (non-removable) or
- Standard Bayonet Base LED
- Plastic Lenses

Table 2-45. Cluster LED Type Indicating Lights — Non-removable LEDs — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Product Description	Supply Voltage	LED Colour	Lamp Life ^①	Catalogue Number	Dimensions in Inches (mm)
 <p>Includes permanently attached lens and board mounted, cluster style LEDs</p> <p>Non-removable LED</p>	24V AC/DC	Red Green Amber	100,000	E22HL2X4 E22HL3X4 E22HL9X4	 <p>1.88 (47.7) 0.58 (14.8) Ø1.16 (29.5)</p>
	48V AC/DC	Red Green Amber	100,000	E22HL2X6 E22HL3X6 E22HL9X6	
	110/120V AC/DC	Red Green Amber	100,000	E22HL2X8 E22HL3X8 E22HL9X8	

^① Published theoretical lamp lives are based on ideal laboratory conditions and should be used for comparison only. Actual life may be shorter due to application conditions.

Table 2-46. Standard LED Type Indicating Lights — Replaceable bayonet base LEDs — UL (NEMA) 3, 3R, 4, 4X, 12, 13


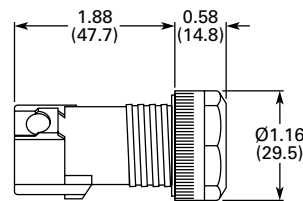
Product Description	Supply Voltage	Colour	Lamp Life ^②	Catalogue Number	Dimensions in Inches (mm)
 <p>Includes lens and T 3-1/4 bayonet base LED</p>	12V AC/DC	Clear Red Green Yellow White Blue Amber	100,000	E22HV0X89 E22HV2X37 E22HV3X38 E22HV4X39 E22HV5X89 E22HV6X51 E22HV9X94	 <p>1.88 (47.7) 0.58 (14.8) Ø1.16 (29.5)</p>
	24V AC/DC	Clear Red Green Yellow White Blue Amber		E22HV0X90 E22HV2X40 E22HV3X41 E22HV4X42 E22HV5X90 E22HV6X52 E22HV9X95	
	48V AC/DC	Clear Red Green Yellow White Blue Amber		E22HV0X91 E22HV2X53 E22HV3X54 E22HV4X55 E22HV5X91 E22HV6X56 E22HV9X87	
	60V AC/DC	Clear Red Green Yellow White Blue Amber		E22HV0X97 E22HV2X57 E22HV3X58 E22HV4X59 E22HV5X97 E22HV6X60 E22HV9X98	
	120V AC	Clear Red Green Yellow White Blue Amber		E22HV0X92 E22HV2X43 E22HV3X44 E22HV4X45 E22HV5X92 E22HV6X61 E22HV9X96	

^② Published theoretical lamp lives are based on ideal laboratory conditions and should be used for comparison only. Actual life may be shorter due to application conditions.

Indicating Light Units — One-Piece Incandescent

- One-Piece Body Style
- Plastic Operators
- Full Voltage and Resistor Type
- Bayonet Base Incandescent Lamp
- Standard or Insert (with Printed Legends) Plastic Lenses

Table 2-47. Incandescent Standard Lens Type Indicating Lights — UL (NEMA) 3, 3R, 4, 4X, 12, 13


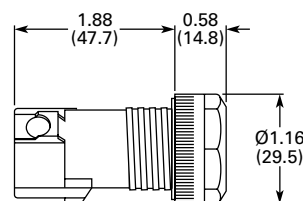
Product Description	Supply Voltage	Colour	Lamp Life ①	Catalogue Number	Dimensions in Inches (mm)
	Includes lens and T 3-1/4 bayonet base lamp	12V AC/DC #756 Lamp	Clear Red Green Yellow White Blue Amber	15,000	E22HV0X3 E22HV2X3 E22HV3X3 E22HV4X3 E22HV5X3 E22HV6X3 E22HV9X3
	24V AC/DC #1819 Lamp	Clear Red Green Yellow White Blue Amber	2,500	E22HV0X4 E22HV2X4 E22HV3X4 E22HV4X4 E22HV5X4 E22HV6X4 E22HV9X4	
	110/120V AC/DC W1121 Lamp	Clear Red Green Yellow White Blue Amber	1,000	E22HV0X8 E22HV2X8 E22HV3X8 E22HV4X8 E22HV5X8 E22HV6X8 E22HV9X8	
	220/240V AC Resistor W1121 Lamp	Clear Red Green Yellow White Blue Amber	1,000	E22HR0X8 E22HR2X8 E22HR3X8 E22HR4X8 E22HR5X8 E22HR6X8 E22HR9X8	
					

① Published theoretical lamp lives are based on ideal laboratory conditions and should be used for comparison only. Actual life may be shorter due to application conditions.

Incandescent — Insert Lens with Printed Legends

Insert version indicating lights allow printed legends to be placed directly on the inside of the lens. To specify lens insert with printed legends, add Suffix Code from table on **Page 2-78**.

Table 2-48. Incandescent Insert Lens Type Indicating Lights — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Product Description	Supply Voltage	Colour	Lamp Life ②	Catalogue Number	Dimensions in Inches (mm)
 <p>Lens Insert with Printed Legend See Page 2-78.</p>	Includes lens and T 3-1/4 bayonet base lamp	12V AC/DC #756 Lamp	Clear Red Green Yellow White Blue Amber	15,000	E22HVA0_X3 E22HVA2_X3 E22HVA3_X3 E22HVA4_X3 E22HVA5_X3 E22HVA6_X3 E22HVA9_X3
	24V AC/DC #1819 Lamp	Clear Red Green Yellow White Blue Amber	2,500	E22HVA0_X4 E22HVA2_X4 E22HVA3_X4 E22HVA4_X4 E22HVA5_X4 E22HVA6_X4 E22HVA9_X4	
	110/120V AC/DC W1121 Lamp	Clear Red Green Yellow White Blue Amber	1,000	E22HVA0_X8 E22HVA2_X8 E22HVA3_X8 E22HVA4_X8 E22HVA5_X8 E22HVA6_X8 E22HVA9_X8	
					

② Published theoretical lamp lives are based on ideal laboratory conditions and should be used for comparison only. Actual life may be shorter due to application conditions.

E22 and EM22 Series, Indicating Light Components



Indicating Light Components

Table 2-49. Indicating Lights — Without Light Unit — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Colour	E22 Series — Plastic Operators	EM22 Series — Metal Operators
		Catalogue Number	Catalogue Number
	25 mm Dia. Standard Lens		
	Red Green Yellow White Blue Amber Clear	E22H2 E22H3 E22H4 E22H5 E22H6 E22H9 E22H0	EM22H2 EM22H3 EM22H4 EM22H5 EM22H6 EM22H9 EM22H0
	25 mm Dia. Lens — Insert Version (To Order with Printed Legend Insert, see Page 2-78.)		
	Red Green Yellow White Blue Amber Clear	E22A2 E22A3 E22A4 E22A5 E22A6 E22A9 E22A0	EM22A2 EM22A3 EM22A4 EM22A5 EM22A6 EM22A9 EM22A0
	25 mm Dia. Glass Lens — Rated 4 – 13 Only		
	Red Green Yellow White Blue Amber Clear	E22F2 E22F3 E22F4 E22F5 E22F6 E22F9 E22F0	— — — — — — —

2

Table 2-50. E22 Monoblock — Full Voltage Indicating Lights without Lamps ① — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Description	Colour	Catalogue Number	Description	Colour	Catalogue Number
	Clear Red Green Yellow White Blue Amber	E22HV0 E22HV2 E22HV3 E22HV4 E22HV5 E22HV6 E22HV9	 <p>Lens Insert with Printed Legend</p>	Clear Red Green Yellow White Blue Amber	E22HVA0 E22HVA2 E22HVA3 E22HVA4 E22HVA5 E22HVA6 E22HVA9
	Diffuser Style ② (Catalogue Numbers are without legends)				

① For LED/incandescent lamps, see Page 2-63 – 2-64.

② For standard legends for diffuser, see Page 2-78.

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.

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E22 and EM22 Series, Complete Devices — Push-Pull Units

Push-Pull Units

- Plastic or Metal Operators
- Black or Chrome Bezel
- Two- and Three-Position
- Illuminated and Non-illuminated
- Incandescent Bayonet Base Lamps
- Transformer or Resistor Light Units









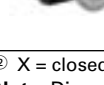
Table 2-51. Two-Position Push-Pull Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Position ①		Non-illuminated		Illuminated – Tall Incandescent Bulb		
	Pull	Push	Button Colour	Catalogue Number	Lens Colour	120V AC Transformer	120V AC/DC Resistor
						Catalogue Number	Catalogue Number
Plastic Operators — Black Bezel							
	X	O	Black Red Green Red (Alum) — EMERG. STOP	E22EDB1B E22EDB2B E22EDB3B E22EDB2N8B	Red Green Amber Red (Alum) — EMERG. STOP	E22GDB2X11B E22GDB3X11B E22GDB9X11B E22GDB2N8X11B	E22GDB2X10B E22GDB3X10B E22GDB9X10B E22GDB2N8X10B
Plastic Operators — Chrome Bezel							
	X	O	Black Red Green Red (Alum) — EMERG. STOP	E22ED1B E22ED2B E22ED3B E22ED2N8B	Red Green Amber Red (Alum) — EMERG. STOP	E22GD2X11B E22GD3X11B E22GD9X11B E22GD2N8X11B	E22GD2X10B E22GD3X10B E22GD9X10B E22GD2N8X10B
Metal Operators — Chrome Bezel							
	X	O	Red Red — EMERG. STOP	EM22ED2B EM22ED2N8B	Red Red — EMERG. STOP	EM22GD2X11B EM22GD2N8X11B	EM22GD2X10B EM22GD2N8X10B

① X = closed circuit, O = open circuit.

Note: Dimensions are listed on Page 2-82.

Table 2-52. Three-Position Push-Pull Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Position ②			Non-illuminated		Illuminated – Tall Incandescent Bulb		
	Pull	Intermediate	Push	Button Colour	Catalogue Number	Lens Colour	120V AC Transformer	120V AC/DC Resistor
							Catalogue Number	Catalogue Number
Plastic Operators — Black Bezel								
Momentary Push, Momentary Pull with 1NC and 1LONC Contact Blocks								
	X X	X O	O O	Black Red Green	E22FDB1S E22FDB2S E22FDB3S	Red Green Amber	E22HDB2X11S E22HDB3X11S E22HDB9X11S	E22HDB2X10S E22HDB3X10S E22HDB9X10S
Momentary Push, Momentary Pull with 1NC and 1ECNO Contact Blocks								
	X O	O O	O X	Black Red Green	E22FDB1T E22FDB2T E22FDB3T	Red Green Amber	E22HDB2X11T E22HDB3X11T E22HDB9X11T	E22HDB2X10T E22HDB3X10T E22HDB9X10T
Plastic Operators — Chrome Bezel								
Momentary Push, Momentary Pull with 1NC and 1LONC Contact Blocks								
	X X	X O	O O	Black Red Green	E22FD1S E22FD2S E22FD3S	Red Green Amber	E22HD2X11S E22HD3X11S E22HD9X11S	E22HD2X10S E22HD3X10S E22HD9X10S
Momentary Push, Momentary Pull with 1NC and 1ECNO Contact Blocks								
	X O	O O	O X	Black Red Green	E22FD1T E22FD2T E22FD3T	Red Green Amber	E22HD2X11T E22HD3X11T E22HD9X11T	E22HD2X10T E22HD3X10T E22HD9X10T
Metal Operators — Chrome Bezel								
3-Position Momentary Push and Pull — 1NC and 1LONO Contact Block								
	X O	O O	O X	Red	EM22FD2T	Red	EM22HD2X11T	EM22HD2X10T
3-Position Momentary Push and Pull — 1NC and 1ECNC Contact Block								
	X X	X O	O O	Red	EM22FD2S	Red	EM22HD2X11S	EM22HD2X10S

② X = closed circuit, O = open circuit.

Note: Dimensions are listed on Page 2-82.

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E22 and EM22 Series, Push-Pull Components

Push-Pull Components — Non-illuminated Operators

Table 2-53. Non-illuminated Push-Pull Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

			E22 Series — Plastic Operators		EM22 Series — Metal Operators			
			Colour	Black Bezel	Chrome Bezel	Colour	Chrome Bezel	
				Catalogue Number	Catalogue Number		Catalogue Number	
E22 Black	E22 Chrome	EM22 Chrome	2-Position — 40 mm Dia. Button ^① (Maintained)					
			Black	E22EDB1	E22ED1	Red	EM22ED2	
			Red	E22EDB2	E22ED2	Green	EM22ED3	
			Green	E22EDB3	E22ED3			
			Yellow	E22EDB4	E22ED4			
			White	E22EDB5	E22ED5			
			Blue	E22EDB6	E22ED6			
			Grey	E22EDB7	E22ED7			
			Orange	E22EDB8	E22ED8			
			3-Position — 40 mm Dia. Button ^① (Spring Return to Centre)					
			Black	E22FDB1	E22FD1	Red	EM22FD2	
			Red	E22FDB2	E22FD2	Green	EM22FD3	
			Green	E22FDB3	E22FD3			
			Yellow	E22FDB4	E22FD4			
			White	E22FDB5	E22FD5			
			Blue	E22FDB6	E22FD6			
			Grey	E22FDB7	E22FD7			
			Orange	E22FDB8	E22FD8			
			3-Position — 40 mm Dia. Push-Pull Pushbutton ^① (Spring Return to Centre from Pulled Position)					
			Black	E22FDMB1	E22FDM1	Red	EM22FDM2	
			Red	E22FDMB2	E22FDM2	Green	EM22FDM3	
			Green	E22FDMB3	E22FDM3			
			Yellow	E22FDMB4	E22FDM4			
			White	E22FDMB5	E22FDM5			
			Blue	E22FDMB6	E22FDM6			
			Grey	E22FDMB7	E22FDM7			
			Orange	E22FDMB8	E22FDM8			

^① These operators can be supplied with EMERGENCY STOP marking (decal) on face ring. To order, add Suffix **N8** to operator Catalogue Number. Example: E22ED2**N8**. With Yellow field, Red letters, add **N796**.

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

Contact Block Selection/Application

Push-Pull operators will accept a maximum of 2 contact blocks (4 circuits, 2-position/2 circuits, 3-position). 5-way mounting adapters can only be used on 2-position Push-Pulls and are not suitable with 3-position Push-Pulls. See **Page 2-70**.

Table 2-54. 2-Position Push-Pull

Contact Block Required		Circuit	Maintained Circuit Operation ^②	
Suffix Code	Catalogue Number		Pulled	Pushed
B	E22B1	1NC	X	O
A	E22B2	1NO	O	X
W	E22B11	1NO-1NC	X	O
			O	X
V	E22B20	2NO	O	X
			O	X

^② X = Closed Circuit O = Open Circuit

Table 2-55. 3-Position Push-Pull — E22B2, E22B11 and E22B20 Cannot Be Used

Contact Block Required		Circuit	Maintained Circuit Operation ^③		
Suffix Code	Catalogue Number		Pulled	Centre	Pushed
S	E22B1 and E22B4	1NC 1NC	X X	O X	O O
T	E22B1 and E22B5	1NC 1NO	X O	O O	O X

^③ X = Closed Circuit O = Open Circuit

Note: Add Contact Block Suffix Code from tables above to operator Catalogue Number to order as a complete device. Example: E22ED1**B** = 2-position chrome bezel, Black button Push-Pull with 1NC contact block.

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E22 and EM22 Series, Illuminated Push-Pull Components

Push-Pull Components — Illuminated Operators

Note: Will accept a maximum of 2 contact blocks when used with supplied 3-way adapter. 5-way mounting adapters are not to be used with 3-position operators, see **Page 2-70**.

Table 2-56. Illuminated Push-Pull Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

			E22 Series — Plastic Operators			EM22 Series — Metal Operators		
			Colour	Black Bezel	Chrome Bezel	Colour	Chrome Bezel	
				Catalogue Number	Catalogue Number		Catalogue Number	
E22 Black	E22 Chrome	EM22 Chrome	2-Position — 40 mm Diameter Lens ①② (Maintained)					
			Red	E22GDB2	E22GD2	Red	EM22GD2	
			Green	E22GDB3	E22GD3	Green	EM22GD3	
			Yellow	E22GDB4	E22GD4	Amber	EM22GD9	
			White	E22GDB5	E22GD5			
			Blue	E22GDB6	E22GD6			
			Amber	E22GDB9	E22GD9			
			Clear	E22GDB0	E22GD0			
			3-Position — 40 mm Diameter Lens ①② (Spring Return to Centre)					
			Red	E22HDB2	E22HD2	Red	EM22HD2	
			Green	E22HDB3	E22HD3	Green	EM22HD3	
			Yellow	E22HDB4	E22HD4	Amber	EM22HD9	
			White	E22HDB5	E22HD5			
			Blue	E22HDB6	E22HD6			
			Amber	E22HDB9	E22HD9			
			Clear	E22HDB0	E22HD0			
			3-Position — 40 mm Dia. Push-Pull Pushbutton ①② (Spring Return to Centre from Pulled Position)					
			Red	E22HDMB2	E22HDM2	Red	EM22HDM2	
			Green	E22HDMB3	E22HDM3	Green	EM22HDM3	
			Yellow	E22HDMB4	E22HDM4	Amber	EM22HDM9	
			White	E22HDMB5	E22HDM5			
			Blue	E22HDMB6	E22HDM6			
			Amber	E22HDMB9	E22HDM9			
			Clear	E22HDMB0	E22HDM0			

① These operators can be supplied with EMERGENCY STOP marking (decal) on face ring. To order, add Suffix **N8** to operator Catalogue Number. Example: E22ED2**N8**. With Yellow field, Red letters, add **N796**.

② All illuminated Push-Pull operators require tall incandescent bulbs or tall LEDs from **Table 2-99** or **Table 2-100 (Page 2-66)**.

29.5 mm Diameter Button — For Both Non-illuminated and Illuminated Push-Pull Operators



29.5 mm Diameter Button Operator

For Push-Pull operator with 29.5 mm diameter button, replace 5th digit (**D**) of the listed Catalogue Number with letter **H**. Example: E22EH1, black, non-illuminated 2-position push-pull operator with 29.5 mm diameter button.

Note: Add Suffix Codes from the tables on **Page 2-62 (Contact Blocks)** and **Pages 2-63 – 2-64 (Light Units)** to operator Catalogue Number to order as a complete device. Example: E22GD2**X4B** = 2-position chrome bezel, Red button lens, 24V light unit Push-Pull with 1NC contact block.

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

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Accessories **Pages 2-67 – 2-71**
 Enclosures **Pages 2-80 – 2-81**
 Legend Plates **Pages 2-72 – 2-78**
 Light Units **Pages 2-63 – 2-66**
 Suffix Codes **Page 2-91**
 Commande d'étiquettes **Pages A-1**

E22 and EM22 Series, Complete Devices — Selector Switches

Selector Switch Units

- Plastic Operators
- Black or Chrome Bezel
- Two-Position
- 45° Throw
- Knob or Lever
- Non-illuminated

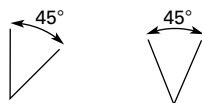


Table 2-57. Two-Position Selector Switch Units — 45° Throw — Cam 2 — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Action ②	Operator Type	Operator Position ①		
		Cam – 2		
		O X	X O O X	O X X O O X X O
		Catalogue Number ③	Catalogue Number ③	Catalogue Number ③

Plastic Operator — Black Bezel

		Knob Lever	E22XB <u>F</u> 1A E22VB <u>F</u> 1A	E22XB <u>F</u> 1C E22VB <u>F</u> 1C	E22XB <u>F</u> 1WW E22VB <u>F</u> 1WW
		Knob Lever	E22XB <u>5</u> 1A E22VB <u>5</u> 1A	E22XB <u>5</u> 1C E22VB <u>5</u> 1C	E22XB <u>5</u> 1WW E22VB <u>5</u> 1WW
		Knob Lever	E22XB <u>E</u> 1A E22VB <u>E</u> 1A	E22XB <u>E</u> 1C E22VB <u>E</u> 1C	E22XB <u>E</u> 1WW E22VB <u>E</u> 1WW
		Knob Lever	E22XB <u>6</u> 1A E22VB <u>6</u> 1A	E22XB <u>6</u> 1C E22VB <u>6</u> 1C	E22XB <u>6</u> 1WW E22VB <u>6</u> 1WW

Plastic Operator — Chrome Bezel

		Knob Lever	E22XF <u>1</u> A E22VF <u>1</u> A	E22XF <u>1</u> C E22VF <u>1</u> C	E22XF <u>1</u> WW E22VF <u>1</u> WW
		Knob Lever	E22X <u>5</u> 1A E22V <u>5</u> 1A	E22X <u>5</u> 1C E22V <u>5</u> 1C	E22X <u>5</u> 1WW E22V <u>5</u> 1WW
		Knob Lever	E22X <u>E</u> 1A E22V <u>E</u> 1A	E22X <u>E</u> 1C E22V <u>E</u> 1C	E22X <u>E</u> 1WW E22V <u>E</u> 1WW
		Knob Lever	E22X <u>6</u> 1A E22V <u>6</u> 1A	E22X <u>6</u> 1C E22V <u>6</u> 1C	E22X <u>6</u> 1WW E22V <u>6</u> 1WW

① X = closed circuit, O = open circuit.

② M = Maintained. S = Spring return in direction of arrow (→).

③ To order with an alternate colour, replace underlined digit (1) of listed Catalogue Number with Code Number from table below.
Example: 2-position operator with Red knob, E22XBF2A

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8

Note: Dimensions are listed on Page 2-82.

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E22 and EM22 Series, Complete Devices — Selector Switches

Selector Switch Units (Continued)

- Plastic or Metal Operators
- Black or Chrome Bezel
- Two-Position
- 60° Throw
- Knob or Lever
- Non-illuminated

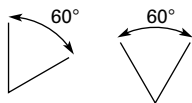


Table 2-58. Two-Position Selector Switch Units — 60° Throw — Cam 2 — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Action ②	Operator Type	Operator Position ①			
			Cam — 2			
			O X	X O O X	O X O X	O X X O O X X O
			Catalogue Number ③	Catalogue Number ③	Catalogue Number ③	Catalogue Number ③

Plastic Operator — Black Bezel

		Knob Lever	<u>E22XBF61A</u> E22VBF61A	<u>E22XBF61C</u> E22VBF61C	— —	<u>E22XBF61WW</u> E22VBF61WW
		Knob Lever	<u>E22XB561A</u> E22VB561A	<u>E22XB561C</u> E22VB561C	— —	<u>E22XB561WW</u> E22VB561WW
		Knob Lever	<u>E22XBE61A</u> E22VBE61A	<u>E22XBE61C</u> E22VBE61C	— —	<u>E22XBE61WW</u> E22VBE61WW
		Knob Lever	<u>E22XB661A</u> E22VB661A	<u>E22XB661C</u> E22VB661C	— —	<u>E22XB661WW</u> E22VB661WW

Plastic Operator — Chrome Bezel

		Knob Lever	<u>E22XF61A</u> E22VF61A	<u>E22XF61C</u> E22VF61C	— —	<u>E22XF61WW</u> E22VF61WW
		Knob Lever	<u>E22X561A</u> E22V561A	<u>E22X561C</u> E22V561C	— —	<u>E22X561WW</u> E22V561WW
		Knob Lever	<u>E22XE61A</u> E22VE61A	<u>E22XE61C</u> E22VE61C	— —	<u>E22XE61WW</u> E22VE61WW
		Knob Lever	<u>E22X661A</u> E22V661A	<u>E22X661C</u> E22V661C	— —	<u>E22X661WW</u> E22V661WW

Metal Operator — Chrome Bezel

		Knob Lever	<u>EM22X561A</u> EM22V561A	<u>EM22X561C</u> EM22V561C	<u>EM22X561D</u> EM22V561D	<u>EM22X561WW</u> EM22V561WW
		Knob Lever	<u>EM22X661A</u> EM22V661A	<u>EM22X661C</u> EM22V661C	<u>EM22X661D</u> EM22V661D	<u>EM22X661WW</u> EM22V661WW
		Knob Lever	<u>EM22XF61A</u> EM22VF61A	<u>EM22XF61C</u> EM22VF61C	<u>EM22XF61D</u> EM22VF61D	<u>EM22XF61WW</u> EM22VF61WW
		Knob Lever	<u>EM22XE61A</u> EM22VE61A	<u>EM22XE61C</u> EM22VE61C	<u>EM22XE61D</u> EM22VE61D	<u>EM22XE61WW</u> EM22VE61WW

① X = closed circuit, O = open circuit.

② M = Maintained. S = Spring return in direction of arrow (→).

③ To order with an alternate colour, replace underlined digit (1) of listed Catalogue Number with Code Number from table below.
Example: 2-position operator with Red knob, E22XBF62A

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8

Note: Dimensions are listed on **Page 2-82**.

Legend Plates **Page 2-79**
 Accessories **Pages 2-67 – 2-71**
 Commande d'étiquettes **Pages A-1**

E22 and EM22 Series, Complete Devices — Selector Switches

Selector Switch Units (Continued)

- Plastic Operators
- Black or Chrome Bezel
- Three-Position
- 45° Throw
- Knob or Lever
- Non-illuminated

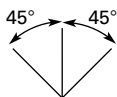


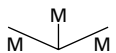
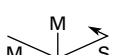
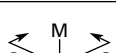
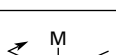



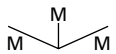
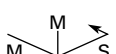
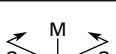
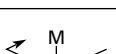
Table 2-59. Three-Position Selector Switch Units — 45° Throw — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Action ^②	Operator Type	Operator Position Circuit ^① 		
			Cam 1	Cam 2	Cam 3
			X O O O O X	X O X O O X	X O O O X O O O X
			Catalogue Number ^③	Catalogue Number ^③	Catalogue Number ^③

Plastic Operator — Black Bezel

		Knob Lever	E22XBG1D E22VBG1D	E22XBH1D E22VBH1D	E22XBG1RR E22VBG1RR
		Knob Lever	E22XBN1D E22VBN1D	E22XBP1D E22VBP1D	E22XBN1RR E22VBN1RR
		Knob Lever	E22XBL1D E22VBL1D	E22XBM1D E22VBM1D	E22XBL1RR E22VBL1RR
		Knob Lever	E22XBJ1D E22VBJ1D	E22XBK1D E22VBK1D	E22XBJ1RR E22VBJ1RR

Plastic Operator — Chrome Bezel

		Knob Lever	E22XG1D E22VG1D	E22XH1D E22VH1D	E22XG1RR E22VG1RR
		Knob Lever	E22XN1D E22VN1D	E22XP1D E22VP1D	E22XN1RR E22VN1RR
		Knob Lever	E22XL1D E22VL1D	E22XM1D E22VM1D	E22XL1RR E22VL1RR
		Knob Lever	E22XJ1D E22VJ1D	E22XK1D E22VK1D	E22XJ1RR E22VJ1RR

① X = closed circuit, O = open circuit.

② M = Maintained. S = Spring return in direction of arrow (→).

③ To order with an alternate colour, replace underlined digit (1) of listed Catalogue Number with Code Number from table below.

Example: 3-position operator with Red knob, E22XBG2D

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8

Note: Dimensions are listed on Page 2-82.

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E22 and EM22 Series, Complete Devices — Selector Switches

Selector Switch Units (Continued)

- Plastic or Metal Operators
- Black or Chrome Bezel
- Three-Position
- 60° Throw
- Knob or Lever
- Non-illuminated

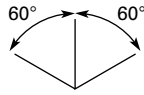


Table 2-60. Three-Position Selector Switch Units — 60° Throw — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Action ^②	Operator Type	Operator Position ^①		
			Cam 1	Cam 2	Cam 1
			X O O O O X	X O X O O X	X O O O X O O O X
Catalogue Number ^③	Catalogue Number ^③	Catalogue Number ^③			

Plastic Operator — Black Bezel

		Knob Lever	E22XBG61D E22VBG61D	E22XBH61D E22VBH61D	E22XBG61RR E22VBG61RR
		Knob Lever	E22XBN61D E22VBN61D	E22XBP61D E22VBP61D	E22XBN61RR E22VBN61RR
		Knob Lever	E22XBL61D E22VBL61D	E22XBM61D E22VBM61D	E22XBL61RR E22VBL61RR
		Knob Lever	E22XBJ61D E22VBJ61D	E22XBK61D E22VBK61D	E22XBJ61RR E22VBJ61RR

Plastic Operator — Chrome Bezel

		Knob Lever	E22XG61D E22VG61D	E22XH61D E22VH61D	E22XG61RR E22VG61RR
		Knob Lever	E22XN61D E22VN61D	E22XP61D E22VP61D	E22XN61RR E22VN61RR
		Knob Lever	E22XL61D E22VL61D	E22XM61D E22VM61D	E22XL61RR E22VL61RR
		Knob Lever	E22XJ61D E22VJ61D	E22XK61D E22VK61D	E22XJ61RR E22VJ61RR

Metal Operator — Chrome Bezel

		Knob Lever	EM22XG61D EM22VG61D	EM22XH61D EM22VH61D	EM22XG61RR EM22VG61RR
		Knob Lever	EM22XN61D EM22VN61D	EM22XP61D EM22VP61D	EM22XN61RR EM22VN61RR
		Knob Lever	EM22XL61D EM22VL61D	EM22XM61D EM22VM61D	EM22XL61RR EM22VL61RR
		Knob Lever	EM22XJ61D EM22VJ61D	EM22XK61D EM22VK61D	EM22XJ61RR EM22VJ61RR

① X = closed circuit, O = open circuit.

② M = Maintained. S = Spring return in direction of arrow (→).

③ To order with an alternate colour, replace underlined digit (1) of listed Catalogue Number with Code Number from table below.
Example: 3-position operator with Red knob, E22XBG62D

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8

Note: Dimensions are listed on **Page 2-82**.

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2




















E22 and EM22 Series, Selector Switch Components

Selector Switches

45° Throw Non-illuminated Lever and Knob Operated Selector Switches — Plastic

Note: Will accept a maximum of 2 contact blocks (4 circuits) with supplied 3-way mounting adapter. Optional 5-way adapter will accept a maximum of 5 contact blocks (10 circuits). See **Page 2-70**.

Table 2-61. 45° Throw Non-illuminated Lever and Knob Operated Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13

		Operating Mode M = Maintained S = Momentary			Cam Code	Plastic — Black Bezel	Plastic — Chrome Bezel	
		Left 	Centre 	Right 		Catalogue Number ①	Catalogue Number ①	
		2-Position — 45° Throw — Black Lever						
		— M	M —	M M	2 2	<u>E22VBF1</u> <u>E22VB51</u>	<u>E22VF1</u> <u>E22V51</u>	
		— M	M —	S S	2 2	<u>E22VBE1</u> <u>E22VB61</u>	<u>E22VE1</u> <u>E22V61</u>	
		3-Position — 45° Throw — Black Lever						
		M M	M M	M M	1 2	<u>E22VBG1</u> <u>E22VBH1</u>	<u>E22VG1</u> <u>E22VH1</u>	
		S S	M M	M M	1 2	<u>E22VBJ1</u> <u>E22VBK1</u>	<u>E22VJ1</u> <u>E22VK1</u>	
		S S	M M	S S	1 2	<u>E22VBL1</u> <u>E22VBM1</u>	<u>E22VL1</u> <u>E22VM1</u>	
		M M	M M	S S	1 2	<u>E22VBN1</u> <u>E22VBP1</u>	<u>E22VN1</u> <u>E22VP1</u>	
		2-Position — 45° Throw — Black Knob						
		— M	M —	M M	2 2	<u>E22XBF1</u> <u>E22XB51</u>	<u>E22XF1</u> <u>E22X51</u>	
		— M	M —	S S	2 2	<u>E22XBE1</u> <u>E22XB61</u>	<u>E22XE1</u> <u>E22X61</u>	
		3-Position — 45° Throw — Black Knob						
		M M	M M	M M	1 2	<u>E22XBG1</u> <u>E22XBH1</u>	<u>E22XG1</u> <u>E22XH1</u>	
		S S	M M	M M	1 2	<u>E22XBJ1</u> <u>E22XBK1</u>	<u>E22XJ1</u> <u>E22XK1</u>	
		S S	M M	S S	1 2	<u>E22XBL1</u> <u>E22XBM1</u>	<u>E22XL1</u> <u>E22XM1</u>	
		M M	M M	S S	1 2	<u>E22XBN1</u> <u>E22XBP1</u>	<u>E22XN1</u> <u>E22XP1</u>	

① Listed selector switches are supplied as standard with Black levers or knobs. To select an alternate colour, change the last digit (underlined) in the listed Catalogue Number using Code Number from following table. Example: E22VE2 — Two-Position Selector Switch with Red Lever.

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	<u>1</u>	Red	<u>2</u>	Green	<u>3</u>	Yellow	<u>4</u>	White	<u>5</u>	Blue	<u>6</u>	Grey	<u>7</u>	Orange	<u>8</u>

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

Ordering Example — A complete Non-illuminated Selector Switch consists of the following:



Operator
See Above



Legend Plate
See Page 2-79



Mounting Adapter
(Supplied with Operator).
For 5-Way Adapter,
See Page 2-70



Contact Blocks
See Page 2-62
















Accessories **Pages 2-67 – 2-71**
Suffix Codes **Page 2-91**
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Selector Switches (Continued)

60° Throw Non-illuminated Lever and Knob Operated Selector Switches

Note: Will accept a maximum of 2 contact blocks (4 circuits) with supplied 3-way mounting adapter. Optional 5-way adapter will accept a maximum of 5 contact blocks (10 circuits). See **Page 2-70**.

Table 2-62. 60° Throw Non-illuminated Lever and Knob Operated Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13

			Operating Mode M = Maintained S = Momentary			Cam Code	E22 Series Plastic Operators		EM22 Series Metal Operators
			Left	Centre	Right		Black Bezel	Chrome Bezel	Chrome Bezel
							Catalogue Number ①	Catalogue Number ①	Catalogue Number ①
			2-Position — 60° Throw — Black Lever						
			— M	M —	M M	2 2	<u>E22VBF61</u> <u>E22VB561</u>	<u>E22VF61</u> <u>E22V561</u>	<u>EM22VF61</u> <u>EM22V561</u>
			— M	M —	S S	2 2	<u>E22VBE61</u> <u>E22VB661</u>	<u>E22VE61</u> <u>E22V661</u>	<u>EM22VE61</u> <u>EM22V661</u>
			3-Position — 60° Throw — Black Lever						
			M M	M M	M M	1 2	<u>E22VBG61</u> <u>E22VBH61</u>	<u>E22VG61</u> <u>E22VH61</u>	<u>EM22VG61</u> <u>EM22VH61</u>
			S S	M M	M M	1 2	<u>E22VBJ61</u> <u>E22VBK61</u>	<u>E22VJ61</u> <u>E22VK61</u>	<u>EM22VJ61</u> <u>EM22VK61</u>
			S S	M M	S S	1 2	<u>E22VBL61</u> <u>E22VBM61</u>	<u>E22VL61</u> <u>E22VM61</u>	<u>EM22VL61</u> <u>EM22VM61</u>
			M M	M M	S S	1 2	<u>E22VBN61</u> <u>E22VBP61</u>	<u>E22VN61</u> <u>E22VP61</u>	<u>EM22VN61</u> <u>EM22VP61</u>
			2-Position — 60° Throw — Black Knob						
			— M	M —	M M	2 2	<u>E22XBF61</u> <u>E22XB561</u>	<u>E22XF61</u> <u>E22X561</u>	<u>EM22XF61</u> <u>EM22X561</u>
			— M	M —	S S	2 2	<u>E22XBE61</u> <u>E22XB661</u>	<u>E22XE61</u> <u>E22X661</u>	<u>EM22XE61</u> <u>EM22X661</u>
			3-Position — 60° Throw — Black Knob						
			M M	M M	M M	1 2	<u>E22XBG61</u> <u>E22XBH61</u>	<u>E22XG61</u> <u>E22XH61</u>	<u>EM22XG61</u> <u>EM22XH61</u>
			S S	M M	M M	1 2	<u>E22XBJ61</u> <u>E22XBK61</u>	<u>E22XJ61</u> <u>E22XK61</u>	<u>EM22XJ61</u> <u>EM22XK61</u>
			S S	M M	S S	1 2	<u>E22XBL61</u> <u>E22XBM61</u>	<u>E22XL61</u> <u>E22XM61</u>	<u>EM22XL61</u> <u>EM22XM61</u>
			M M	M M	S S	1 2	<u>E22XBN61</u> <u>E22XBP61</u>	<u>E22XN61</u> <u>E22XP61</u>	<u>EM22XN61</u> <u>EM22XP61</u>

① Listed selector switches are supplied as standard with Black levers or knobs. To select an alternate colour, change the last digit (underlined) in the listed Catalogue Number using Code Number from following table. Example: E22VE62 — Two-Position Selector Switch with Red Lever.

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

Ordering Example — A complete Non-illuminated Selector Switch consists of the following:



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 Suffix Codes..... **Page 2-91**
 Commande d'étiquettes..... **Pages A-1**




E22 and EM22 Series, Key Operated Selector Switch Components

Selector Switches (Continued)

Key Operated Selector Switches

Note: Key removal from maintained positions only — will accept a maximum of 2 contact blocks (4 circuits) with supplied 3-way mounting adapter. Optional 5-way adapter will accept a maximum of 5 contact blocks (10 circuits).

Table 2-63. Key Operated Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operating Mode M = Maintained S = Momentary			Cam Code	E22 Series Plastic Operators				EM22 Series Metal Operators		Allowable Key Removal Positions ①②
	Left	Centre	Right		Black Bezel		Chrome Bezel		Chrome Bezel		
					45°	60°	45°	60°	45°	60°	
				Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number		
	2-Position										
	M	—	M	2	<u>E22KB53</u>	—	<u>E22K53</u>	—	—	—	1, 2
	M	—	S	2	<u>E22KB62</u>	—	<u>E22K62</u>	—	—	—	—
	—	M	M	2	<u>E22KBF5</u>	—	<u>E22KF5</u>	—	—	<u>EM22KF5</u>	1, 4
	—	M	S	2	<u>E22KBE4</u>	—	<u>E22KE4</u>	—	—	<u>EM22KE4</u>	—
	 	3-Position									
M		M	M	1	<u>E22KBG7</u>	<u>E22KBG67</u>	<u>E22KG7</u>	<u>E22KG67</u>	<u>EM22KG7</u>	<u>EM22KG67</u>	1 – 6
M		M	M	2	<u>E22KBH7</u>	<u>E22KBH67</u>	<u>E22KH7</u>	<u>E22KH67</u>	<u>EM22KH7</u>	<u>EM22KH67</u>	1 – 6
S		M	M	1	<u>E22KBJ5</u>	<u>E22KBJ65</u>	<u>E22KJ5</u>	<u>E22KJ65</u>	<u>EM22KJ5</u>	<u>EM22KJ65</u>	1, 4
S		M	M	2	<u>E22KBK5</u>	<u>E22KBK65</u>	<u>E22KK5</u>	<u>E22KK65</u>	<u>EM22KK5</u>	<u>EM22KK65</u>	1, 4
S		M	S	1	<u>E22KBL4</u>	<u>E22KBL64</u>	<u>E22KL4</u>	<u>E22KL64</u>	<u>EM22KL4</u>	<u>EM22KL64</u>	—
S		M	S	2	<u>E22KBM4</u>	<u>E22KBM64</u>	<u>E22KM4</u>	<u>E22KM64</u>	<u>EM22KM4</u>	<u>EM22KM64</u>	—
M		M	S	1	<u>E22KBN6</u>	<u>E22KBN66</u>	<u>E22KN6</u>	<u>E22KN66</u>	<u>EM22KN6</u>	<u>EM22KN66</u>	2, 4
M		M	S	2	<u>E22KBP6</u>	<u>E22KBP66</u>	<u>E22KP6</u>	<u>E22KP66</u>	<u>EM22KP6</u>	<u>EM22KP66</u>	2, 4

2

① To order operator with other than standard key removal position(s), select allowable option from table below and change last (underlined) digit of listed Catalogue Number using Suffix Code shown. Example: E22KG6 — Three-Position Selector Switch with key removable from Left and Centre positions.

② To order a different key and lock assembly, add suffix B1, C1, D1, E1 or F1 to the end of the Catalogue Number.

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.

Table 2-64. Key Removal Options

Key Removal Position	Code Suffix	Key Removal Position	Code Suffix	Key Removal Position	Code Suffix
Right Only	1	Centre Only	4	Right, Left and Centre	7
Left Only	2	Right and Centre	5		
Right and Left	3	Left and Centre	6		

Table 2-65. Spare Keys

Description	Reference Number Stamped on Key	Catalogue Number
Standard Lock	92239	E22KS2
B1 Key Suffix	92208	E22KS23
C1 Key Suffix	92209	E22KS24
D1 Key Suffix	92210	E22KS25
E1 Key Suffix	92328	E22KS26
F1 Key Suffix	92339	E22KS27

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April 2009












E22 and EM22 Series, Illuminated Selector Switch Components

Illuminated Selector Switches

45° Throw Illuminated Lever and Knob Operated Selector Switches — Plastic

Note: Will accept a maximum of 2 contact blocks (4 circuits) with supplied 3-way mounting adapter. Optional 5-way adapter will accept a maximum of 4 contact blocks (8 circuits).

Table 2-66. 45° Throw Illuminated Lever and Knob Operated Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13

		Operating Mode M = Maintained S = Momentary			Cam Code	E22 Series — Plastic Operators	
		Left 	Centre 	Right 		Black Bezel	Chrome Bezel
						Catalogue Number ①	Catalogue Number ①
Black Bezel 	Chrome Bezel 	2-Position — 45° Throw — Red Lever					
—	M	M	2	<u>E22WBF2</u>	<u>E22WF2</u>		
M	—	M	2	<u>E22WB52</u>	<u>E22W52</u>		
—	M	S	2	<u>E22WBE2</u>	<u>E22WE2</u>		
M	—	S	2	<u>E22WB62</u>	<u>E22W62</u>		
		3-Position — 45° Throw — Red Lever					
M	M	M	1	<u>E22WBG2</u>	<u>E22WG2</u>		
M	M	M	2	<u>E22WBH2</u>	<u>E22WH2</u>		
S	M	M	1	<u>E22WBJ2</u>	<u>E22WJ2</u>		
S	M	M	2	<u>E22WBK2</u>	<u>E22WK2</u>		
S	M	S	1	<u>E22WBL2</u>	<u>E22WL2</u>		
S	M	S	2	<u>E22WBM2</u>	<u>E22WM2</u>		
M	M	S	1	<u>E22WBN2</u>	<u>E22WN2</u>		
M	M	S	2	<u>E22WBP2</u>	<u>E22WP2</u>		
Black Bezel 	Chrome Bezel 	2-Position — 45° Throw — Red Knob					
—	M	M	2	<u>E22SBF2</u>	<u>E22SF2</u>		
M	—	M	2	<u>E22SB52</u>	<u>E22S52</u>		
—	M	S	2	<u>E22SBE2</u>	<u>E22SE2</u>		
M	—	S	2	<u>E22SB62</u>	<u>E22S62</u>		
		3-Position — 45° Throw — Red Knob					
M	M	M	1	<u>E22SBG2</u>	<u>E22SG2</u>		
M	M	M	2	<u>E22SBH2</u>	<u>E22SH2</u>		
S	M	M	1	<u>E22SBJ2</u>	<u>E22SJ2</u>		
S	M	M	2	<u>E22SBK2</u>	<u>E22SK2</u>		
S	M	S	1	<u>E22SBL2</u>	<u>E22SL2</u>		
S	M	S	2	<u>E22SBM2</u>	<u>E22SM2</u>		
M	M	S	1	<u>E22SBN2</u>	<u>E22SN2</u>		
M	M	S	2	<u>E22SBP2</u>	<u>E22SP2</u>		

① Listed selector switches are supplied as standard with Red levers or knobs. To select an alternate colour, change the last digit (underlined) in the listed Catalogue Number using Code Number from following table. Example: E22WF3 — Two-Position Selector Switch with Green Lever.

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Red	2	Green	3	Yellow	4	White	5	Blue	6	Amber	9	Clear	0

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.

Ordering Example — A complete Illuminated Selector Switch consists of the following:



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E22 and EM22 Series, Illuminated Selector Switch Components

Illuminated Selector Switches (Continued)

60° Throw Illuminated Lever and Knob Operated Selector Switches

Note: Will accept a maximum of 2 contact blocks (4 circuits) with standard mounting adapter supplied. Optional 5-way adapter will accept a maximum of 4 contact blocks (8 circuits).

Table 2-67. 60° Throw Illuminated Lever and Knob Operated Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operating Mode M = Maintained S = Momentary			Cam Code	E22 Series Plastic Operators		E2M2 Series Metal Operators
	Left 	Centre 	Right 		Black Bezel	Chrome Bezel	Chrome Bezel
					Catalogue Number ①	Catalogue Number ①	Catalogue Number ①
2-Position — 60° Throw — Red Lever							
	—	M	M	2	<u>E22WBF62</u>	<u>E22WF62</u>	<u>EM22WF62</u>
	M	—	M	2	<u>E22WB562</u>	<u>E22W562</u>	<u>EM22W562</u>
	—	M	S	2	<u>E22WBE62</u>	<u>E22WE62</u>	<u>EM22WE62</u>
	M	—	S	2	<u>E22WB662</u>	<u>E22W662</u>	<u>EM22W662</u>
	3-Position — 60° Throw — Red Lever						
	M	M	M	1	<u>E22WBG62</u>	<u>E22WG62</u>	<u>EM22WG62</u>
	M	M	M	2	<u>E22WBH62</u>	<u>E22WH62</u>	<u>EM22WH62</u>
	S	M	M	1	<u>E22WBJ62</u>	<u>E22WJ62</u>	<u>EM22WJ62</u>
	S	M	M	2	<u>E22WBK62</u>	<u>E22WK62</u>	<u>EM22WK62</u>
	S	M	S	1	<u>E22WBL62</u>	<u>E22WL62</u>	<u>EM22WL62</u>
	S	M	S	2	<u>E22WBM62</u>	<u>E22WM62</u>	<u>EM22WM62</u>
	M	M	S	1	<u>E22WBN62</u>	<u>E22WN62</u>	<u>EM22WN62</u>
	M	M	S	2	<u>E22WBP62</u>	<u>E22WP62</u>	<u>EM22WP62</u>
2-Position — 60° Throw — Red Knob							
	—	M	M	2	<u>E22SBF62</u>	<u>E22SF62</u>	<u>EM22SF62</u>
	M	—	M	2	<u>E22SB562</u>	<u>E22S562</u>	<u>EM22S562</u>
	—	M	S	2	<u>E22SBE62</u>	<u>E22SE62</u>	<u>EM22SE62</u>
	M	—	S	2	<u>E22SB662</u>	<u>E22S662</u>	<u>EM22S662</u>
3-Position — 60° Throw — Red Knob							
	M	M	M	1	<u>E22SBG62</u>	<u>E22SG62</u>	<u>EM22SG62</u>
	M	M	M	2	<u>E22SBH62</u>	<u>E22SH62</u>	<u>EM22SH62</u>
	S	M	M	1	<u>E22SBJ62</u>	<u>E22SJ62</u>	<u>EM22SJ62</u>
	S	M	M	2	<u>E22SBK62</u>	<u>E22SK62</u>	<u>EM22SK62</u>
	S	M	S	1	<u>E22SBL62</u>	<u>E22SL62</u>	<u>EM22SL62</u>
	S	M	S	2	<u>E22SBM62</u>	<u>E22SM62</u>	<u>EM22SM62</u>
	M	M	S	1	<u>E22SBN62</u>	<u>E22SN62</u>	<u>EM22SN62</u>
	M	M	S	2	<u>E22SBP62</u>	<u>E22SP62</u>	<u>EM22SP62</u>

① Listed selector switches are supplied as standard with Red levers or knobs. To select an alternate colour, change the last digit (underlined) in the listed Catalogue Number using Code Number from following table. Example: E22WF63 — Two-Position Selector Switch with Green Lever.

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Red	2	Green	3	Yellow	4	White	5	Blue	6	Amber	9	Clear	0

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.

Ordering Example — A complete Illuminated Selector Switch consists of the following:



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Selector Switch Selection

Cam and Contact Block Selection — For 2- and 3-Position Selector Switches

1. Develop a line circuit diagram required for each application. Then, by using the symbols "X" for contact closed and "O" for contact open, determine the contact state required in each selector switch position.
2. Visually locate the closure sequence in one of the 2- or 3-Position Selector Switch Combination tables on **Pages 2-53 – 2-54**.
3. Find the contact block(s), their Suffix Code letter(s) and their mounting location(s) required for that circuit configuration, by referring to the table next to the "X O" closure sequence that was selected.

Note: Contact Blocks must be mounted in position indicated. Selector switches will not accept a contact block in position 3 of the mounting adapter. If more circuits and/or different circuit arrangements are required, see Rotary Cam Selector Switches listed on **Pages 2-55 – 2-56 and 2-88 – 2-89**.

Example: HAND-OFF-AUTO function, two circuits are required.

Circuit #1 — X O O
This can be achieved using Cam 1 with an E22B2 contact block mounted in the left (1-) position.

Circuit #2 — O O X
This can be achieved using Cam 1 with an E22B2 block mounted in the right (2-) position.

Order a 3-Position Selector Switch with Cam #1
Example: E22VG1, along with 2 E22B2 Contact Blocks.

Cam and Contact Block Selection

Table 2-68. 2-Position Switches

Circuit ↖ ↗	Cam	Catalogue Number of Contact Block(s)/ Mounting Position		Code Suffix
		1	2	
O X	2	E22B2 or E22B2		A
X O	2	E22B1 or E22B1		B
O X X O	2	E22B11	—	W
O X X O	2	E22B2	E22B1	C
O X O X	2	E22B20	—	V
O X O X	2	E22B2	E22B2	D
X O X O	2	E22B1	E22B1	E
O X O X O X	2	E22B20	E22B2	VA
X O O X X O	2	E22B1	E22B11	WB
X O O X O X	2	E22B1	E22B20	VB
O X X O O X	2	E22B11	E22B2	WA
O X O X O X O X	2	E22B20	E22B20	VV
O X O X O X X O	2	E22B20	E22B11	VW
O X X O O X X O	2	E22B11	E22B11	WW

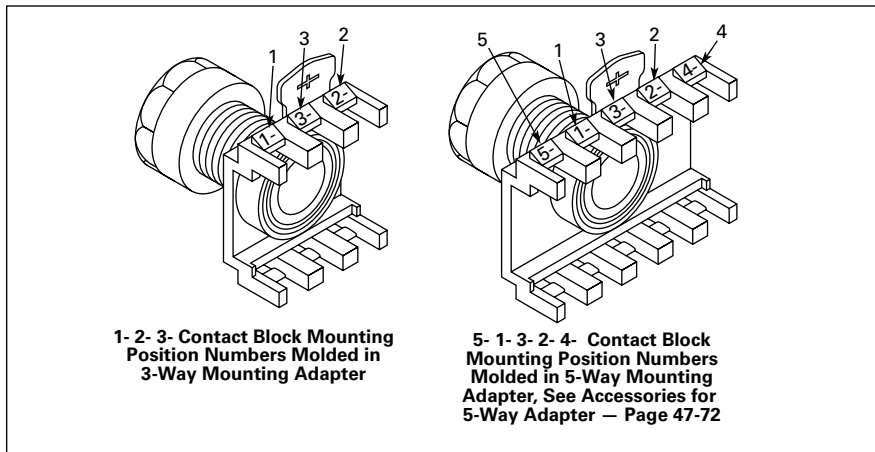


Figure 2-8. Contact Block Mounting

E22 and EM22 Series, Selector Switch Selection

Cam and Contact Block Selection (Continued)

Table 2-69. 3-Position Switches

Circuit ↖ ↑ ↗	Cam	Catalogue Number of Contact Block(s) Mounting Position		Code Suffix
		1	2	
X O O	1	E22B2	—	A
O O X	1	—	E22B2	A
O X X	1	E22B1	—	B
X X O	1	—	E22B1	B
X O X	2	E22B2	—	A
O X O	2	E22B1	—	B
O O X	2	—	E22B2	A
X X O	2	—	E22B1	B
X O O	1	E22B2	E22B2	D
O O X	1	E22B2	E22B1	C
X X O	1	E22B1	E22B2	C
O X X	1	E22B1	E22B1	E
X O O	1	E22B11	—	W
O X X	1	E22B20	—	V
X O O	1	E22B20	—	V
O O X	1	—	E22B11	W
O O X	1	—	E22B20	V
X O O	1	E22B11	E22B1	PP
O O X	1	E22B11	E22B1	PP
X O X	2	E22B2	E22B2	D
O O X	2	E22B2	E22B1	C
X X O	2	E22B2	E22B1	C
O X O	2	E22B1	E22B2	C
O O X	2	E22B1	E22B1	E
X X O	2	E22B1	E22B1	E
X O X	2	E22B11	—	W
O X X	2	E22B11	—	W
X O X	2	E22B20	—	V
X O X	2	E22B20	—	V
O O X	2	E22B11	—	W
X X O	2	E22B11	—	W
O O X	2	—	E22B20	V

Table 2-69. 3-Position Switches (Continued)

Circuit ↖ ↑ ↗	Cam	Catalogue Number of Contact Block(s) Mounting Position		Code Suffix
		1	2	
X O O	1	E22B2	E22B11	WA
O O X	1	E22B2	E22B11	WA
X X O	1	E22B2	E22B11	WA
X O O	1	E22B2	E22B20	VA
O O X	1	E22B2	E22B20	VA
O O X	1	E22B2	E22B20	VA
O X X	1	E22B1	E22B11	WB
O O X	1	E22B1	E22B11	WB
X X O	1	E22B1	E22B11	WB
O X X	1	E22B1	E22B20	VB
O O X	1	E22B1	E22B20	VB
O O X	1	E22B1	E22B20	VB
X O O	1	E22B11	E22B2	WA
O X X	1	E22B11	E22B2	WA
O O X	1	E22B11	E22B2	WA
X O O	1	E22B20	E22B2	VA
X O O	1	E22B20	E22B2	VA
O O X	1	E22B20	E22B2	VA
X O O	1	E22B11	E22B1	WB
O X X	1	E22B11	E22B1	WB
X X O	1	E22B11	E22B1	WB
X O O	1	E22B20	E22B1	VB
X O O	1	E22B20	E22B1	VB
X X O	1	E22B20	E22B1	VB
X O O	1	E22B11	E22B11	RR
O X X	1	E22B11	E22B11	RR
O O X	1	E22B11	E22B11	RR
O O X	1	E22B11	E22B11	RR
X O X	2	E22B2	E22B11	WA
O O X	2	E22B2	E22B11	WA
X X O	2	E22B2	E22B11	WA
X O X	2	E22B2	E22B20	VA
O O X	2	E22B2	E22B20	VA
O O X	2	E22B2	E22B20	VA
O X O	2	E22B1	E22B11	WB
O O X	2	E22B1	E22B11	WB
X X O	2	E22B1	E22B11	WB
O X O	2	E22B1	E22B20	VB
O O X	2	E22B1	E22B20	VB
O O X	2	E22B1	E22B20	VB
X O X	2	E22B11	E22B2	WA
O X X	2	E22B11	E22B2	WA
O O X	2	E22B11	E22B2	WA
X O X	2	E22B20	E22B2	VA
X O X	2	E22B20	E22B2	VA
O O X	2	E22B20	E22B2	VA

Table 2-69. 3-Position Switches (Continued)

Circuit ↖ ↑ ↗	Cam	Catalogue Number of Contact Block(s) Mounting Position		Code Suffix
		1	2	
X O X	2	E22B11	E22B1	WB
O X O	2	E22B11	E22B1	WB
X X O	2	E22B11	E22B1	WB
X O X	2	E22B20	E22B1	VB
X O X	2	E22B20	E22B1	VB
X X O	2	E22B20	E22B1	VB
X O O	1	E22B11	E22B11	WW
O X X	1	E22B11	E22B11	WW
O O X	1	E22B11	E22B11	WW
X X O	1	E22B11	E22B11	WW
X O O	1	E22B11	E22B20	VW
O X X	1	E22B11	E22B20	VW
O O X	1	E22B11	E22B20	VW
O O X	1	E22B20	E22B11	VW
X O O	1	E22B20	E22B11	VW
X O O	1	E22B20	E22B20	VV
O X X	1	E22B20	E22B20	VV
O O X	1	E22B20	E22B20	VV
O O X	1	E22B20	E22B20	VV
X O X	2	E22B11	E22B11	WW
O X O	2	E22B11	E22B11	WW
O O X	2	E22B11	E22B11	WW
X X O	2	E22B11	E22B11	WW
X O X	2	E22B11	E22B20	VW
O X X	2	E22B11	E22B20	VW
O O X	2	E22B11	E22B20	VW
O O X	2	E22B11	E22B20	VW
X O X	2	E22B20	E22B11	VW
X O X	2	E22B20	E22B11	VW
X X O	2	E22B20	E22B11	VW
X O X	2	E22B20	E22B20	VV
X O X	2	E22B20	E22B20	VV
O O X	2	E22B20	E22B20	VV
O O X	2	E22B20	E22B20	VV

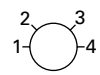
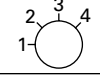
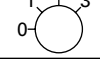
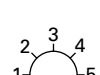
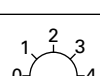
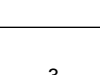
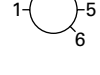
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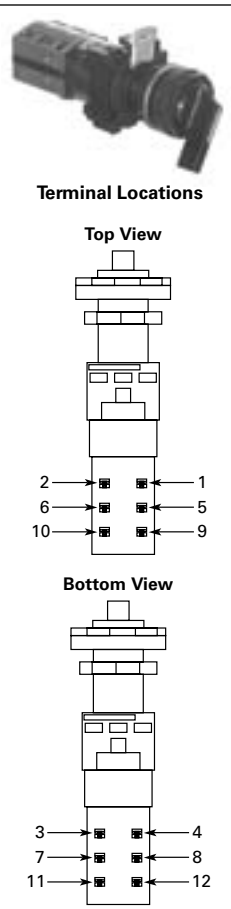
E22 and EM22 Series, Complete Devices — Rotary Cam Selector Switch Units

Rotary Cam Selector Switch Units

- Plastic Operator
- Black or Chrome Bezel
- Four- to Six-Position
- Knob, Lever or Key Version
- Non-illuminated

Table 2-70. Four- to Six-Position Selector Switch Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact block rating, see Page 2-88. Includes contact blocks. Components overpacked in a single carton.	Terminal Numbers	Contact Sequence O = Circuit Open; X = Circuit Closed	Switch Position (45° Throw Between Each Position — Except as Noted)	Operator Type	Black Bezel Catalogue Number ①	Chrome Bezel Catalogue Number ①
Four-Position Maintained						
		0 1 2 3 4	(60° Throw) 			
	1-2 5-6 7-8 3-4	X O O O O X O O O O X O O O O X		Lever Knob	E22JDBN1 E22LDBN1	E22JDN1 E22LDN1
	1-2 5-6 3-4 7-8	X O O O O X O O O O X O O O O X		Lever Knob Key ②	E22JDB4W1 E22LDB4W1 E22KDB4W8	E22JD4W1 E22LD4W1 E22KD4W8
	1-2 5-6 3-4	O X O O O O X O O O O X		Lever Knob Key ②	E22JDB4Y1 E22LDB4Y1 E22KDB4Y8	E22JD4Y1 E22LD4Y1 E22KD4Y8
Five-Position Maintained						
		0 1 2 3 4 5				
	1-2 5-6 9-10 7-8 3-4	X O O O O O X O O O O O X O O O O O X O O O O O X		Lever Knob Key ②	E22JDB5W1 E22LDB5W1 E22KDB5W8	E22JD5W1 E22LD5W1 E22KD5W8
	1-2 5-6 3-4 7-8	O X O O O O O X O O O O O X O O O O O X		Lever Knob Key ②	E22JDB5Y1 E22LDB5Y1 E22KDB5Y8	E22JD5Y1 E22LD5Y1 E22KD5Y8
Six-Position Maintained						
		0 1 2 3 4 5 6				
	1-2 5-6 9-10 11-12 3-4 7-8	X O O O O O O X O O O O O O X O O O O O O X O O O O O O X O O O O O O X		Lever Knob Key ②	E22JDB6W1 E22LDB6W1 E22KDB6W8	E22JD6W1 E22LD6W1 E22KD6W8
	1-2 5-6 7-8 9-10 3-4	O X O O O O O O X O O O O O O X O O O O O O X O O O O O O X		Lever Knob Key ②	E22JDB6Y1 E22LDB6Y1 E22KDB6Y8	E22JD6Y1 E22LD6Y1 E22KD6Y8



① Listed selector switches are supplied as standard with Black levers or knobs. To select an alternate colour, change the last digit in the listed Catalogue Number using Code Number from following table. Example: E22LDN2 — four-position selector switch with Red knob.
② Key removable in all maintained positions (no alternates).

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8

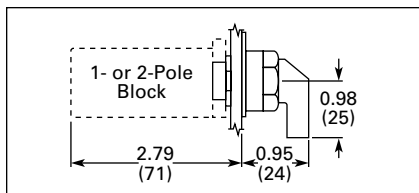


Figure 2-9. Approx. Dimensions in Inches (mm)
For each additional (1- or 2-pole) block add 0.47" (12 mm).

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E22 and EM22 Series, Complete Devices — Rotary Cam Selector Switch Units

Rotary Cam Selector Switch Units (Continued)

- Plastic Operators
- Black or Chrome Bezel
- Seven- and Eight-Position
- Knob, Lever or Key Version
- Non-illuminated

Table 2-71. Seven- and Eight-Position Selector Switch Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact block ratings, see Page 2-88. Includes contact blocks. Components overpacked in a single carton.	Terminal Numbers	Contact Sequence O = Circuit Open; X = Circuit Closed	Switch Position (45° Lever Throw Between Each Position)	Operator Type	Black Bezel Catalogue Number ①	Chrome Bezel Catalogue Number ①
Seven-Position Maintained						
		0 1 2 3 4 5 6 7				
1 - 2		X O O O O O O O		Lever Knob Key ②	E22JDB7W1 E22LDB7W1 E22KDB7W8	E22JD7W1 E22LD7W1 E22KD7W8
5 - 6		O X O O O O O O				
9 - 10		O O X O O O O O				
13 - 14		O O O X O O O O				
3 - 4		O O O O X O O O				
7 - 8		O O O O O X O O				
11 - 12		O O O O O O X				
1 - 2		O X O O O O O O		Lever Knob Key ②	E22JDB7Y1 E22LDB7Y1 E22KDB7Y8	E22JD7Y1 E22LD7Y1 E22KD7Y8
5 - 6		O X O O O O O O				
9 - 10		O O O X O O O O				
11 - 12		O O O O X O O O				
3 - 4		O O O O O X O O				
7 - 8		O O O O O O X				
Eight-Position Maintained						
		0 1 2 3 4 5 6 7 8				
1 - 2		X O O O O O O O		Lever Knob Key ②	E22JDB8W1 E22LDB8W1 E22KDB8W8	E22JD8W1 E22LD8W1 E22KD8W8
5 - 6		O X O O O O O O				
9 - 10		O O X O O O O O				
13 - 14		O O O X O O O O				
3 - 4		O O O O X O O O				
7 - 8		O O O O O X O O				
11 - 12		O O O O O O X O				
15 - 16		O O O O O O O X				
1 - 2		O X O O O O O O		Lever Knob Key ②	E22JDB8Y1 E22LDB8Y1 E22KDB8Y8	E22JD8Y1 E22LD8Y1 E22KD8Y8
5 - 6		O O X O O O O O				
9 - 10		O O O X O O O O				
13 - 14		O O O O X O O O				
3 - 4		O O O O O X O O				
7 - 8		O O O O O O X				
11 - 12		O O O O O O X				



2

① Listed selector switches are supplied as standard with Black levers or knobs. To select an alternate colour, change the last digit in the listed Catalogue Number using Code Number from following table. Example: E22LDN2 — four-position selector switch with Red knob.

② Key removable in all maintained positions (no alternates).

Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code
Black	1	Red	2	Green	3	Yellow	4	White	5	Blue	6	Grey	7	Orange	8


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E22 and EM22 Series, Specialty Operators

Specialty Operators

Table 2-72. Potentiometers with Knob Operator ① — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Ohms	0.5 Watt Max./120V Max.			2 Watt Max./120V Max.		
		E22 Plastic Black Bezel	E22 Plastic Chrome Bezel	EM22 Metal Chrome Bezel	E22 Plastic Black Bezel	E22 Plastic Chrome Bezel	EM22 Metal Chrome Bezel
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
 Order Legend Plate from Below	1,000	E22PXB1C1	E22PX1C1	EM22PX1C1	E22PXB1F1	E22PX1F1	EM22PX1F1
	2,500	E22PXB1C2	E22PX1C2	EM22PX1C2	E22PXB1F2	E22PX1F2	EM22PX1F2
	5,000	E22PXB1C5	E22PX1C5	EM22PX1C5	E22PXB1F5	E22PX1F5	EM22PX1F5
	10,000	E22PXB1C10	E22PX1C10	EM22PX1C10	E22PXB1F10	E22PX1F10	EM22PX1F10
	25,000	E22PXB1C25	E22PX1C25	EM22PX1C25	E22PXB1F25	E22PX1F25	EM22PX1F25
	50,000	E22PXB1C50	E22PX1C50	EM22PX1C50	E22PXB1F50	E22PX1F50	EM22PX1F50
	Operator Only	E22PXB1C0	E22PX1C0	EM22PX1C0	E22PXB1F0	E22PX1F0	EM22PX1F0

① Potentiometers are not IP1X or IP2X rated.

Table 2-73. Potentiometer Legend Plate

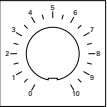
	Description	Catalogue Number
	Potentiometer Legend Plate	E22NJP99

Table 2-74. Flush Pushbutton Operators with Mechanical Push Rod — UL (NEMA) 3, 3R, 4, 4X, 12, 13




	Description	Colour	Plastic Black Bezel	Plastic Chrome Bezel
			Catalogue Number	Catalogue Number
	25 mm Diameter Flush Pushbutton Operators supplied with Mechanical Push Rod Suitable for external mechanical reset of overload relays. Push rod must be cut to desired length.	Grey Blue Red	E22PB7L E22PB6L E22PB2L	E22P7L E22P6L E22P2L

Table 2-75. Wobble Stick Operator — UL (NEMA) 3, 3R, 4, 4X, 12, 13

		Description	E22 Series Plastic Catalogue Number	EM22 Series Metal Catalogue Number
		Wobble Stick — Allows activation of controls by pushing stick in any direction.	E22WS	EM22WS

Note: Dimensions are listed on Page 2-82. For Rear of Panel Extensions, see Table 2-124 on Page 2-87.


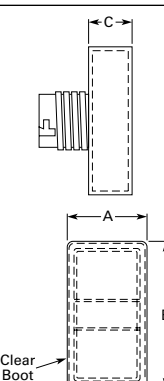
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 Legend Plates Pages 2-72 – 2-78
 Suffix Codes Page 2-91
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E22 and EM22 Series, Double Headed Pushbutton Components

Double Headed Pushbuttons


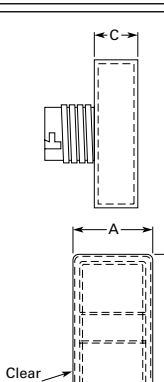
Table 2-76. Illuminated and Non-illuminated Double Headed Pushbuttons — UL (NEMA) 1 IP40

	Description	Operator Colours	Marking	Plastic — Black Bezel	Dimensions
				Catalogue Number	
	Non-illuminated Double Headed Pushbutton	Green — Red	Unmarked	E22DB1A11	
		Green — Red		E22DB1A21	
	Non-illuminated Double Headed Pushbutton with 1NO and 1NC Contact Block	Green — Red	Unmarked	E22DB1A11C	
		Green — Red		E22DB1A21C	
	Illuminated Double Headed Pushbutton with Clear Lens ①	Green — Red	Unmarked	E22DB1A10	
		Green — Red		E22DB1A20	
	Illuminated Double Headed Pushbutton with Clear Lens, ① and 120V Transformer Light Unit ②	Green — Red	Unmarked	E22DB1A10X11	
		Green — Red		E22DB1A20X11	
	Illuminated Double Headed Pushbutton with Clear Lens, ① 120V Transformer Light Unit ② and 1NO and 1NC Contact Block	Green — Red	Unmarked	E22DB1A10X11C	
		Green — Red		E22DB1A20X11C	

① For lens colours other than clear, replace the **0** above with the appropriate Colour Code from **Table 2-80** on **Page 2-59**.

② For light units other than 120V transformer, replace the **X11** code above with the appropriate Suffix from **Table 2-78** on **Page 2-59**.

Table 2-77. Illuminated and Non-illuminated Double Headed Pushbuttons — UL (NEMA) 1 IP65 ⑤

	Description	Operator Colours	Marking	Plastic — Black Bezel	Dimensions
				Catalogue Number	
	Non-illuminated Double Headed Pushbutton	Green — Red	Unmarked	E22DB1B11	
		Green — Red	O	E22DB1B21	
	Non-illuminated Double Headed Pushbutton with 1NO and 1NC Contact Block	Green — Red	Unmarked	E22DB1B11C	
		Green — Red	O	E22DB1B21C	
	Illuminated Double Headed Pushbutton with Clear Lens ③	Green — Red	Unmarked	E22DB1B10	
		Green — Red	O	E22DB1B20	
	Illuminated Double Headed Pushbutton with Clear Lens, ③ and 120V Transformer Light Unit ②	Green — Red	Unmarked	E22DB1B10X11	
		Green — Red	O	E22DB1B20X11	
	Illuminated Double Headed Pushbutton with Clear Lens, ③ 120V Transformer Light Unit ② and 1NO and 1NC Contact Block	Green — Red	Unmarked	E22DB1B10X11C	
		Green — Red	O	E22DB1B20X11C	

③ For lens colours other than clear, replace the **0** above with the appropriate Colour Code from **Table 2-80** on **Page 2-59**.

④ For light units other than 120V transformer, replace the **X11** code above with the appropriate Suffix from **Table 2-78** on **Page 2-59**.

⑤ IP65 or UL (NEMA) 3, 3R, 4, 4X, 12, 13 versions include protective silicon boot E22DBB.

Note: Add Contact Block Suffix from table on **Page 2-91** to operator Catalogue Number to order as a complete device. Example: E22DB1A11B = non-illuminated double headed pushbutton, unmarked, IP40 with 1NC contact block.

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Double Headed Pushbuttons (Continued)

Table 2-78. Light Unit ①

Description	Suffix Code	Catalogue Number
Direct Voltage Unit AC/DC		
Without Lamp	X1	E22D
Without Lamp	X1	E22DE
With 6V Lamp	X2	E22D6
With 12V Lamp	X3	E22D12
With 24V Lamp	X4	E22D24
With 48V Lamp	X6	E22D50
With 60V Lamp	X7	E22D60
Resistor Type Unit AC/DC		
120V/60 Hz	X10	E22R2
Transformer Unit AC Only		
120V/60 Hz	X11	E22TL1
240V/60 Hz	X12	E22TL2
480V/60 Hz	X14	E22TL4
Silicon Boot for IP65 Ingress Protection	—	E22DBB

① Additional light units — See Pages 2-63 – 2-64.

Table 2-79. Light Unit Specifications

Catalogue Number	Function	Bulb Type	Max. Voltage
E22D	Indicating Light	Incandescent, LED or Neon	250V
	Illuminated Operator	Incandescent	60V
E22DE	Illuminated Operator	LED or Neon	120V

Table 2-80. Lens Colour

Lens Colour	Colour Code
Clear	0
Red	2
Green	3
Yellow	4
White	5
Blue	6
Amber	9

Table 2-81. Overall Dimensions in Inches (mm)



	With Boot	Without Boot
Dimension A	1.19 (30.2)	1.11 (28.2)
Dimension B	2.28 (57.9)	2.20 (55.9)
Dimension C	0.68 (17.3)	0.48 (12.2)

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Joystick Complete Devices

Momentary and Maintained Joystick Switches

Table 2-82. Joystick Switches — UL (NEMA) 1, 2, 3, 4, 4X, 12, 13

	Position	Description	Catalogue Number
	2-Position	Momentary Joystick Switch Momentary Joystick Switch with Centre Lock	EM22JS2Y2X EM22JS2Y4X
		Maintained Joystick Switch Maintained Joystick Switch with Centre Lock	EM22JS2Y3X EM22JS2Y5X
	4-Position	Momentary Joystick Switch Momentary Joystick Switch with Centre Lock	EM22JS4Y2X EM22JS4Y4X
		Maintained Joystick Switch Maintained Joystick Switch with Centre Lock	EM22JS4Y3X EM22JS4Y5X

Note: Dimensions are listed on Page 2-82.

Contact Block Selection/Application

Table 2-83. Joystick Operators



	Position	Description	Circuit	Catalogue Number
	2-Position	Joystick Contact Block Assembly	2NO	EM22JS2Y1
	4-Position	Joystick Contact Block Assembly	4NO	EM22JS4Y1

Table 2-84. Contact Sequence for Two-Position Joystick

	Contact Blocks			Joystick Operator Position (X = Closed, O = Open)		
	Circuit	Location	Term No.	Up	Centre	Down
$\frac{14}{24} / \frac{13}{23}$	NO	Top	14 – 13	O	O	X
	NO	Bottom	24 – 23	X	O	O

Table 2-85. Contact Sequence for Four-Position Joystick



	Contact Blocks				Joystick Operator Position (X = Closed, O = Open)				
	Circuit	Position	Location	Term No.	Up	Left	Centre	Down	Right
$\frac{14}{24} / \frac{13}{23}$	NO	Front	Top	14 – 13	O	O	O	X	O
	NO	Front	Bottom	24 – 23	O	O	O	O	X
$\frac{34}{44} / \frac{33}{43}$	NO	Back	Top	34 – 33	X	O	O	O	O
	NO	Back	Bottom	44 – 43	O	X	O	O	O

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EM22 Series — Joystick Components

**EM22 Series, Joystick Components
Momentary and Maintained Joystick Operators**

Table 2-86. Joystick Operators — UL (NEMA) 1, 2, 3, 4, 4X, 12, 13

	Position	Description	Catalogue Number
	2-Position	Momentary Joystick Operator	EM22JS2Y2
		Momentary Joystick Operator with Centre Lock	EM22JS2Y4
		Maintained Joystick Operator	EM22JS2Y3
		Maintained Joystick Operator with Centre Lock	EM22JS2Y5
	4-Position	Momentary Joystick Operator	EM22JS4Y2
		Momentary Joystick Operator with Centre Lock	EM22JS4Y4
		Maintained Joystick Operator	EM22JS4Y3
		Maintained Joystick Operator with Centre Lock	EM22JS4Y5

Note: Dimensions are listed on **Page 2-82**. For Rear of Panel Extensions, see **Table 2-124** on **Page 2-87**.

Contact Block Selection/Application

Table 2-87. Joystick Operators



	Position	Description	Circuit	Catalogue Number
	2-Position	Joystick Contact Block Assembly	2NO	EM22JS2Y1
	4-Position	Joystick Contact Block Assembly	4NO	EM22JS4Y1

Table 2-88. Contact Sequence for Two-Position Joystick

	Contact Blocks			Joystick Operator Position (X = Closed, O = Open)		
	Circuit	Location	Term No.	Up	Centre	Down
$\frac{14}{24} / \frac{13}{23}$	NO	Top	14 – 13	O	O	X
	NO	Bottom	24 – 23	X	O	O

Table 2-89. Contact Sequence for Four-Position Joystick

	Contact Blocks				Joystick Operator Position (X = Closed, O = Open)				
	Circuit	Position	Location	Term No.	Up	Left	Centre	Down	Right
$\frac{14}{24} / \frac{13}{23}$	NO	Front	Top	14 – 13	O	O	O	X	O
	NO	Front	Bottom	24 – 23	O	O	O	O	X
$\frac{34}{44} / \frac{33}{43}$	NO	Back	Top	34 – 33	X	O	O	O	O
	NO	Back	Bottom	44 – 43	O	X	O	O	O

E22 and EM22 Series, Contact Blocks

Contact Blocks

Table 2-90. Contact Blocks

	Description	Suffix Code ①	Catalogue Number	Approximate Dimensions in Inches (mm)
	1NC 1NO 1NO Early Make 1NC Late Break 1NC (Logic) 1NO (Logic) 1NC Added Spring Pressure	B A — — — — —	E22B1 ④ E22B2 E22B3 E22B4 ② E22B1E ③ E22B2E ③ E22BR1	
	1NO-1NC 2NO	W V	E22B11 ④ E22B20	
	1 Self Monitoring 1NC	—	E22CB1M ⑤	

- ① Add Suffix to operator Catalogue Number to order as a complete device. Example E22PB1B = Flush Black pushbutton with 1NC contact block.
- ② E22B4 contact block not available for use with 5-way mounting adapter.
- ③ For low voltage applications.
- ④ Marked with Direct Opening Action (DOA) Symbol ⊕ per IEC 60947-5-1 (Annex K) and NEMA ICS 5 (Part 6).
- ⑤ For use with Trigger Action Emergency Stop Operators.

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⊕ Direct Opening Action (DOA) for IEC 60947-5-1 (Annex K) and NEMA ICS 5 (Part 6) Compliance

Table 2-91. Mechanical Operating Parameters of Operators with E22B1 and E22B11 (NC Contacts Only)

DOA Operating Parameters	Latching Trigger Action E-Stop		Pushbuttons				2-Position Push-Pull		3-Position Push-Pull				Key, Lever and Knob Selector Switches			
	E-Stop + E22B1	E-Stop + E22B11	25 mm + E22B1	25 mm + E22B11	Mush-room + E22B1	Mush-room + E22B11	2-Pos. Push-Pull + E22B1	2-Pos. Push-Pull + E22B11	Push + E22B1	Push + E22B11	Pull + E22B1	Pull + E22B11	Spring Return + E22B1	Spring Return + E22B11	Maintained + E22B1	Maintained + E22B11
Min. Travel to Open Contact — Inches (mm)	0.24 (6.1)	0.24 (6.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)	0.08 (2.1)
Min. Force to Open Contact — lb (N)	5.00 (22.24)	5.00 (22.24)	0.74 (3.27)	0.90 (4.00)	0.84 (3.74)	1.00 (4.45)	0	0	2.09 (9.31)	2.25 (10.02)	3.01 (13.37)	3.17 (14.08)	0.29 (1.29)	0.45 (2.00)	0.30 (1.34)	0.46 (2.05)
Total Travel — Inches (mm)	0.29 (7.4)	0.29 (7.4)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)	0.23 (5.8)

Table 2-92. Master Packed Contact Blocks and Light Units

	Description	Catalogue Number
	Contact Blocks or Light Units Master Packed in Quantities of 100 Only — Contact Block 1NC (Available singly in Catalogue as E22B1) Contact Block 1NO (Available singly in Catalogue as E22B2) Light Unit without Lamp Full Voltage (Available singly in Catalogue as E22D) Light Unit Resistor Type 120V 60 Hz (Available singly in Catalogue as E22R2) Light Unit Transformer Type 120V 60 Hz (Available singly in Catalogue as E22TL1)	E22AA6 E22AA7 E22AA12 E22AA24 E22AA11

April 2009

E22 and EM22 Series, Illuminated Components

Light Units and Lamps




E22 light units consist of two versions — standard size LED lamps and tall LED lamps. Select the standard LED light

units for all indicating lights, illuminated pushbuttons, push-push (alternate action) or double-headed pushbutton

operators. Select the tall LED light units for all illuminated selector switches and push-pull operators.

LED Light Units

Table 2-93. LED Light Units — Includes a T3-1/4 (BA9) Bayonet Base LED

	Type	Supply Voltage	LED Colour	Suffix Code	Standard LED ①	Tall LED ②		
					Catalogue Number	Catalogue Number		
 <p><i>Tall LED Light Unit</i></p>  <p><i>Standard LED Light Unit</i></p>	Full Voltage	Unit without Lamp	—	X1	E22DE	E22DE		
		6V – 12V AC/DC	Red Green Yellow Blue White Orange	X37 X38 X39 X51 X89 X94	E22DL612R E22DL612G E22DL612Y E22DL612B E22DL612W E22DL612O	E22DLT612R E22DLT612G E22DLT612Y E22DLT612B E22DLT612W E22DLT612O		
		24V AC/DC	Red Green Yellow Blue White Orange	X40 X41 X42 X52 X90 X95	E22DL24R E22DL24G E22DL24Y E22DL24B E22DL24W E22DL24O	E22DLT24R E22DLT24G E22DLT24Y E22DLT24B E22DLT24W E22DLT24O		
		48V AC/DC	Red Green Yellow Blue White Orange	X53 X54 X55 X56 X91 X87	E22DL48R E22DL48G E22DL48Y E22DL48B E22DL48W E22DL48O	E22DLT48R E22DLT48G E22DLT48Y E22DLT48B E22DLT48W E22DLT48O		
		60V AC/DC	Red Green Yellow Blue White Orange	X57 X58 X59 X60 X97 X98	E22DL60R E22DL60G E22DL60Y E22DL60B E22DL60W E22DL60O	E22DLT60R E22DLT60G E22DLT60Y E22DLT60B E22DLT60W E22DLT60O		
		120V AC/DC	Red Green Yellow Blue White Orange	X43 X44 X45 X61 X92 X96	E22DL120R E22DL120G E22DL120Y E22DL120B E22DL120W E22DL120O	E22DLT120R E22DLT120G E22DLT120Y E22DLT120B E22DLT120W E22DLT120O		
		 <p><i>Transformer Light Unit with Tall LED</i></p>	Transformer AC Only	120V	Red Green Yellow Blue White Orange	— — — — — —	E22TL1LR E22TL1LG E22TL1LY E22TL1LB E22TL1LW E22TL1LO	E22TL1TLR E22TL1TLG E22TL1TLY E22TL1TLB E22TL1TLW E22TL1TLO
				240V	Red Green Yellow Blue White Orange	— — — — — —	E22TL2LR E22TL2LG E22TL2LY E22TL2LB E22TL2LW E22TL2LO	E22TL2TLR E22TL2TLG E22TL2TLY E22TL2TLB E22TL2TLW E22TL2TLO
				480V	Red Green Yellow Blue White Orange	— — — — — —	E22TL4LR E22TL4LG E22TL4LY E22TL4LB E22TL4LW E22TL4LO	E22TL4TLR E22TL4TLG E22TL4TLY E22TL4TLB E22TL4TLW E22TL4TLO

① Not suitable for illuminated selector switches or push-pull operators. Select tall LED light unit instead.

② Not suitable for indicating lights, illuminated pushbuttons, push-push or double-headed pushbutton operators. Select standard LED light units instead.



Contact Blocks Page 2-62
 Suffix Codes Page 2-91
 Commande d'étiquettes Pages A-1

E22 and EM22 Series, Illuminated Components

Light Units and Lamps (Continued)


E22 light units consist of two versions — with standard bulb or with tall bulbs. Select the standard bulb light units for all indicating lights, illuminated push-buttons, push-push (alternate action) or

double-headed pushbutton operators. Select the tall bulb light units for all illuminated selector switches and push-pull operators.

Caution: Please note that 120V full voltage light units (E22D120) are only suitable for indicating light operators and will overheat in other operators.

Incandescent Light Units

Table 2-94. Incandescent Light Units — Includes a T3-1/4 (BA9) Bayonet Base Lamp (except when noted)

	Type	Supply Voltage 50/60 Hz	Lamp Voltage	Suffix Code	Standard Bulb ①	Tall Bulb ②
					Catalogue Number	Catalogue Number
	Full Voltage AC/DC	Unit without Lamp	—	X1	E22D	E22D
		6	6	X2	E22D6	E22DT6
		12	12	X3	E22D12	E22DT12
		24	24	X4	E22D24	E22DT24
		48	48	X6	E22D50	E22DT50
		60	60	X7	E22D60	E22DT60
		120	120	X8	E22D120 ③	—
		Resistor AC/DC	120	60	X10	E22R2
	Transformer AC Only	120	6	X11	E22TL1	E22TL1T
		240	6	X12	E22TL2	E22TL2T
380/415		6	X13	E22TL3	E22TL3T	
480		6	X14	E22TL4	E22TL4T	


① Not suitable for illuminated selector switches or push-pull operators. Select tall bulb light units instead.

② Not suitable for indicating lights, illuminated pushbuttons, push-push or double-headed pushbutton operators. Select standard bulb light units instead.

③ E22D120 light units are suitable for indicating light operators only.

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Table 2-95. PresTest Units — Includes Pre-wired 1NO-1NC Contact Blocks

	Type	Supply Voltage 50/60 Hz	Lamp Voltage	Light Suffix Code	Standard Bulb ④	Tall Bulb ⑤
					Catalogue Number	Catalogue Number
	Full Voltage AC/DC	Unit without Lamp	—	X17	E22D0C	E22D0C
		24	24	X20	E22D24C	E22DT24C
	Resistor AC/DC	120	60	X26	E22R2C	E22RT2C
		120	6	X27	E22TL1C	E22TL1C
	Transformer AC Only	240	6	X28	E22TL2C	E22TL2C
		380/415	6	X29	E22TL3C	E22TL3C
		480	6	X30	E22TL4C	E22TL4C

④ Not suitable for illuminated selector switches or push-pull operators. Select tall bulb light units instead.

⑤ Not suitable for indicating lights, illuminated pushbuttons, push-push or double-headed pushbutton operators. Select standard bulb light units instead.


Table 2-96. Master Packed Contact Blocks and Light Units

	Description	Catalogue Number
	Contact Blocks or Light Units Master Packed in Quantities of 100 Only — Contact Block 1NC (Available singly in Catalogue as E22B1) Contact Block 1NO (Available singly in Catalogue as E22B2) Light Unit without Lamp Full Voltage (Available singly in Catalogue as E22D) Light Unit Resistor Type 120V 60 Hz (Available singly in Catalogue as E22R2) Light Unit Transformer Type 120V 60 Hz (Available singly in Catalogue as E22TL1)	E22AA6 E22AA7 E22AA12 E22AA24 E22AA11

Contact Blocks **Page 2-62**
 Suffix Codes **Page 2-91**
 Commande d'étiquettes **Pages A-1**


Replacement LEDs and Bulbs — Standard Size for Indicating Lights and Pushbutton Switches

Table 2-97. Replacement LEDs for Indicating Lights and Pushbutton Switches

	Voltage	Colour	Continuous		Flashing	
			AC/DC	AC	DC	
			Catalogue Number	Catalogue Number	Catalogue Number	
 <p>Standard LED Lamp</p>	6V – 12V	Red Orange Yellow Green Blue White	E22LED612RN E22LED612ON E22LED612YN E22LED612GN E22LED612BN E22LED612WN	E22LED006RAF E22LED006OAF E22LED006YAF E22LED006GAF E22LED006BAF E22LED006WAF	E22LED006RDF E22LED006ODF E22LED006YDF E22LED006GDF E22LED006BDF E22LED006WDF	
	24V	Red Orange Yellow Green Blue White	E22LED024RN E22LED024ON E22LED024YN E22LED024GN E22LED024BN E22LED024WN	E22LED024RAF E22LED024OAF E22LED024YAF E22LED024GAF E22LED024BAF E22LED024WAF	E22LED024RDF E22LED024ODF E22LED024YDF E22LED024GDF E22LED024BDF E22LED024WDF	
	48V	Red Orange Yellow Green Blue White	E22LED048RN E22LED048ON E22LED048YN E22LED048GN E22LED048BN E22LED048WN	E22LED048RAF E22LED048OAF E22LED048YAF E22LED048GAF E22LED048BAF E22LED048WAF	E22LED048RDF E22LED048ODF E22LED048YDF E22LED048GDF E22LED048BDF E22LED048WDF	
	60V	Red Orange Yellow Green Blue White	E22LED060RN E22LED060ON E22LED060YN E22LED060GN E22LED060BN E22LED060WN	E22LED060RAF E22LED060OAF E22LED060YAF E22LED060GAF E22LED060BAF E22LED060WAF	E22LED060RDF E22LED060ODF E22LED060YDF E22LED060GDF E22LED060BDF E22LED060WDF	
	120V	Red Orange Yellow Green Blue White	E22LED120RN E22LED120ON E22LED120YN E22LED120GN E22LED120BN E22LED120WN	E22LED120RAF E22LED120OAF E22LED120YAF E22LED120GAF E22LED120BAF E22LED120WAF	E22LED120RDF E22LED120ODF E22LED120YDF E22LED120GDF E22LED120BDF E22LED120WDF	

2

Table 2-98. Replacement Bulbs — T3-1/4 (BA9) Bayonet Base Type for Indicating Lights and Pushbutton Switches

Description	Mfg. Part Number	Operating Voltage (V)/ Wattage (W)	Catalogue Number
 <p>Standard Incandescent Bulb</p>	#755 #756 #1819 W1225 W1226 W1121	6V (0.9W) 12V (1.2W) 24V (1.2W) 48/50V (1.0W) 60V (1.2W) 120V (2.4W)	28-2202 28-5184 28-2468-24 28-2468-19 28-2468-20 28-2468-7
	Neon ①	NE51H-R22 NE51H-R68	120 (0.3W) 240 (0.6W)


① Neon bulbs are suitable for use in indicating lights only. Not to be used with any operator.

Note: See Page 2-66 for Replacement LEDs and bulbs for Push-Pulls and selector switches.

E22 and EM22 Series, Illuminated Components


Replacement LEDs and Bulbs (Continued)

Table 2-99. Replacement Tall LEDs for Selector Switch and Push-Pull Operators ONLY

	Voltage	Colour	Continuous		Flashing	
			AC/DC	AC	DC	
			Catalogue Number	Catalogue Number	Catalogue Number	
 <p>Tall LED Lamp</p>	6V – 12V	Red Orange Yellow Green Blue White	E22LEDT612RN E22LEDT612ON E22LEDT612YN E22LEDT612GN E22LEDT612BN E22LEDT612WN	E22LEDT006RAF E22LEDT006OAF E22LEDT006YAF E22LEDT006GAF E22LEDT006BAF E22LEDT006WAF	E22LEDT006RDF E22LEDT006ODF E22LEDT006YDF E22LEDT006GDF E22LEDT006BDF E22LEDT006WDF	
	24V	Red Orange Yellow Green Blue White	E22LEDT024RN E22LEDT024ON E22LEDT024YN E22LEDT024GN E22LEDT024BN E22LEDT024WN	E22LEDT024RAF E22LEDT024OAF E22LEDT024YAF E22LEDT024GAF E22LEDT024BAF E22LEDT024WAF	E22LEDT024RDF E22LEDT024ODF E22LEDT024YDF E22LEDT024GDF E22LEDT024BDF E22LEDT024WDF	
	48V	Red Orange Yellow Green Blue White	E22LEDT048RN E22LEDT048ON E22LEDT048YN E22LEDT048GN E22LEDT048BN E22LEDT048WN	E22LEDT048RAF E22LEDT048OAF E22LEDT048YAF E22LEDT048GAF E22LEDT048BAF E22LEDT048WAF	E22LEDT048RDF E22LEDT048ODF E22LEDT048YDF E22LEDT048GDF E22LEDT048BDF E22LEDT048WDF	
	60V	Red Orange Yellow Green Blue White	E22LEDT060RN E22LEDT060ON E22LEDT060YN E22LEDT060GN E22LEDT060BN E22LEDT060WN	E22LEDT060RAF E22LEDT060OAF E22LEDT060YAF E22LEDT060GAF E22LEDT060BAF E22LEDT060WAF	E22LEDT060RDF E22LEDT060ODF E22LEDT060YDF E22LEDT060GDF E22LEDT060BDF E22LEDT060WDF	
	120V	Red Orange Yellow Green Blue White	E22LEDT120RN E22LEDT120ON E22LEDT120YN E22LEDT120GN E22LEDT120BN E22LEDT120WN	E22LEDT120RAF E22LEDT120OAF E22LEDT120YAF E22LEDT120GAF E22LEDT120BAF E22LEDT120WAF	E22LEDT120RDF E22LEDT120ODF E22LEDT120YDF E22LEDT120GDF E22LEDT120BDF E22LEDT120WDF	

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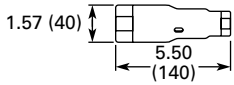

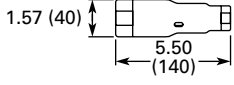

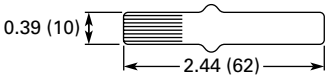


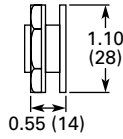

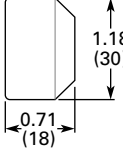
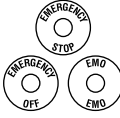

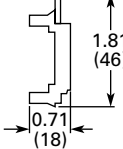

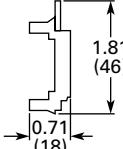

Table 2-100. Replacement Tall Bulbs — T3-1/4 (BA9) Bayonet Base Type for Selector Switch and Push-Pull Operators ONLY

Description	Operating Voltage (V)/ Wattage (W)	Catalogue Number
 <p>Tall Incandescent Bulb</p>	6V (1.0W)	28-6731
	12V (1.2W)	28-6731-2
	24V (1.2W)	28-6731-3
	32V (1.2W)	28-6731-7
	48V (1.0W)	28-6731-4
	60V (1.2W)	28-6731-5
	120V (2.2W)	28-6731-6

Note: See Page 2-65 for Replacement LEDs and bulbs for indicating lights and pushbutton switches.

Accessories



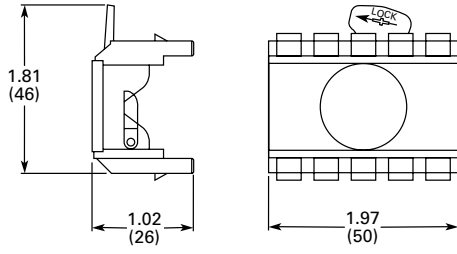

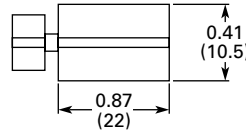



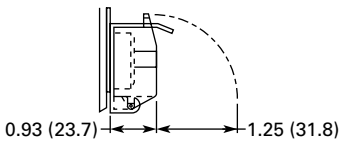
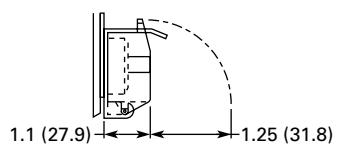

Table 2-101. EM22 and E22 Series Accessories

	Description	Catalogue Number	Overall Dimensions Inches (mm)
	Octagonal Wrench — For easy tightening of back-of-panel mounting nut on E22 (plastic) operators	E22CW	
	Octagonal Wrench — For easy tightening of back-of-panel mounting nut on EM22 (metal) operators	E22CWM	
	Bulb Removal Tool — To facilitate bulb removal from front of panel on all illuminated operators	E22BA3	
	Hole Cutting Tool — For 22.5 mm Diameter mounting hole. Maximum Thickness: Steel — 16 SWG (1.63 mm) Aluminum — 14 SWG (2.03 mm)	E22BA5	
	Hole Plug — Forms oil- and watertight seal for unused panel holes — UL Listed Type 4-4X-13 Black Nylon Stainless Steel	E22BHP E22BA8	
	Protective Boot — Silicon Rubber. For use with 25 mm Diameter Flush and Extended pushbutton operators only — Clear Red Green Black	E22BCM E22BRM E22BGM E22BBM	
	Upsize Yellow Legend Plates ① — 1.77" (45 mm) Blank 2.76" (70 mm) Blank 2.76" (70 mm) Printed EMERGENCY STOP 2.76" (70 mm) Printed EMERGENCY OFF 2.76" (70 mm) Printed EMO	E22VA2 E22VA1 E22VA8 E22VA4 E22VA5	
	Mounting Adapter — Supplied as standard with E22 operators. Provides contact block and light unit mounting.	E22BA1	
	Mounting Adapter with Barrier — Supplied as standard with E22 Trigger Action Emergency Stop Operators. Provides contact block unit mounting only.	E22BA7	
	Auto Latch Mounting Adapter — Supplied as standard with EM22 operators. Provides contact block and light unit mounting.	E22BA1A	

① Yellow plates comply with EN418 of the European Machinery Directive background requirements.


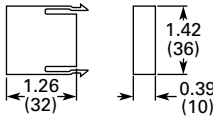

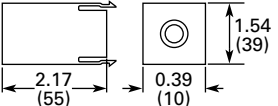
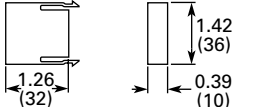


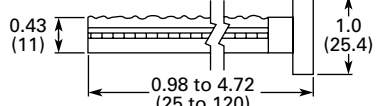

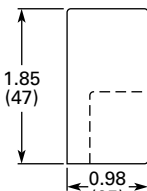

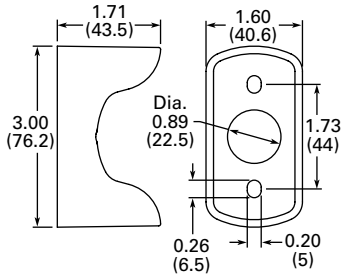
EM22 and E22 Series, Accessories

Table 2-101. EM22 and E22 Series Accessories (Continued)

	Description	Catalogue Number	Overall Dimensions Inch (mm)
	Mounting Adapter with Barrier — Supplied as standard with EM22 Trigger Action Emergency Stop Operators. Provides contact block unit mounting only.	E22BA7A	
	5-Way Mounting Adapter ① — Provides contact block and light unit mounting for up to 10 circuits. The standard 3-way mounting adapter E22BA1 allows up to 6 circuits. For non-illuminated PBs and 2-position selector switches For illuminated PBs and 2-position selector switches For non-illuminated 3-position selector switches with Cam #1 For illuminated 3-position selector switches with Cam #1 Additional information — See Page 2-70	E22BA11 E22BA11L E22BA12 E22BA12L	
	Operator Plug — Must be inserted into rear of momentary action pushbutton and mushroom head operators when 3rd Contact Block is installed in centre position. Not to be used with maintained action or illuminated operators — minimum order quantity 10 pieces. To assemble, push plug into the rear of the operator. On mushroom operators, cut down the plug to 15.2 mm [0.62"] prior to assembly. Plug is notched to indicate cut down length.	E22BA2	
	Adapter Kit — Enables a 22.5 mm operator to be mounted in a 30.5 mm mounting hole — panel thickness from 1/16 to 7/32 inch (1.6 to 5.6 mm).	E22ARK	
	Locating Ring — Provides additional anti-rotation features when using optional panel mounting hole notch — minimum order quantity 10 pieces (metal)	E22LRM	
	Padlockable Transparent Cover — Suitable for use with 25 mm Flush and Extended Pushbutton operators only	E22PCM	
	Padlockable Transparent Cover — Suitable for use with 25 mm Extended Pushbutton operators only. Enables NC circuit to be held open.	E22PCPM	
	Padlockable Transparent Cover — Suitable for use with 28 mm Mushroom operators, Knob and Key Selector switches	E22BA9	
	Quick Connect Terminals — For easy installation of wired connections. 300V clearance. Minimum order quantity 10 pieces.	E22AT	

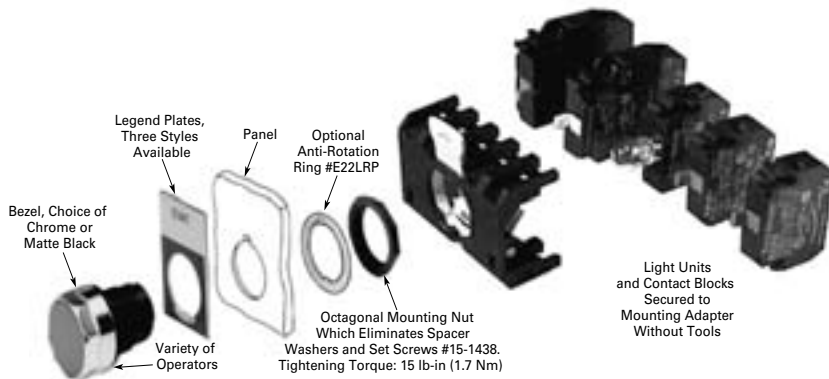
① Cannot be used with 3-position Push-Pull operators, Cam #2 3-position selector switches, trigger action pushbutton or E22B4/E22BF4 contact blocks.

Table 2-101. EM22 and E22 Series Accessories (Continued)

	Description	Catalogue Number	Overall Dimensions in Inches (mm)
	Contact Blocks with Quick Connect Terminal Assembled – 300V clearance – 1NC 1NO 1NO Early Make 1NC Late Break 1NO-1NC 2NO	E22BF1 E22BF2 E22BF3 E22BF4 ① E22BF11 E22BF20	 Single Circuit
	Light Units with Quick Connect Terminals Assembled ② – 300V clearance – Transformer Type AC Only – 120/110V, 60/50 Hz Resistor/Diode AC 120/110V Full Voltage AC/DC 24V Without Bulb	E22TLF1 E22RF2 E22DF24 E22DF	 Transformer Type  Full Voltage & Resistor Types
	Contact Blocks or Light Units Master Packed in Quantities of 100 Only – Contact Block 1NC (Available singly in Catalogue as E22B1) Contact Block 1NO (Available singly in Catalogue as E22B2) Light Unit without Lamp Full Voltage (Available singly in Catalogue as E22D) Light Unit Resistor Type 120V 60 Hz (Available singly in Catalogue as E22R2) Light Unit Transformer Type 120V 60 Hz (Available singly in Catalogue as E22TL1)	E22AA6 E22AA7 E22AA12 E22AA24 E22AA11	
	Mechanical Push Rod – For use with all non-illuminated pushbutton and momentary mushroom head operators. Suitable for external mechanical reset of overload relays. Must be cut to proper length. Uncut – 4.72 inches (119.9 mm) long	E22MRL	
	Mushroom Shroud ③ – Protects against inadvertent operation. Chrome shroud (cut-away type) Chrome shroud (full type) Black shroud (cut-away type) Black shroud (full type) Chrome shroud (cut-away type for use with push/pull pushbuttons) Black shroud (cut-away type for use with push/pull pushbuttons)	E22MS E22MSF E22MBFS E22MBFSF E22MSP E22MBSP	
	Mushroom Guard – For 40 mm Trigger Action Switch – To be used with E22LTA2 and E22LTA2N123 operators.	E22MGTA	

① E22BF4 contact block not available for use with 5-way mounting adapters.
② For devices not listed, contact your Eaton Distributor or call our Customer Support Centre 1-800-268-3578.
③ For use with 28 mm and 40 mm diameter mushroom pushbutton operators.

E22 and EM22 Series, Accessories



5-Way Mounting Adapter

5-Way Mounting Adapter

The E22 5-way mounting adapter listed below allows up to 5 single circuit or up to 5 double circuit contact blocks (10 total circuits) to be mounted behind a single operator.


Slightly more spacing (approximately 0.79 in. [20 mm]) is required for this mounting adapter as indicated in the Minimum Spacing table below.

For selector switch applications, the cam and contact blocks selection must be determined using the procedure and selection tables listed on Pages 2-53 – 2-54.

Table 2-102. Minimum Spacing — Inches (mm)

Size/Type of Operator	Dimension A			Dimension B
	Mounting Adapter Type(s)			
	Two 3-Way	One 3-Way & One 5-Way	Two 5-Way	
All Types up to 1.18 in. (30 mm) Dia. Including Knob and Key Operated Selector Switches — except those listed below	1.18 (30)	1.58 (40)	1.97 (50)	1.97 (50)
Lever Operated Selector Switch Operators and 1.18 – 1.57 in. (30 – 40 mm) Diameter Operators	1.77 (45)	1.77 (45)	1.97 (50)	1.97 (50)
1.97 in. (50 mm) Diameter Operators	2.16 (55)	2.16 (55)	2.16 (55)	2.16 (55)
Large Yellow Round Legend Plate — 2.76 in. (70 mm) Diameter	2.95 (75)	2.95 (75)	2.95 (75)	2.95 (75)
Pushbutton Operators fitted with Rubber Boots or Padlockable Cover	1.38 (35)	1.58 (40)	1.97 (50)	1.97 (50)

Table 2-103. 5-Way Mounting Adapter

	Description	Catalogue Number
	<p>5-Way Mounting Adapter ① — Provides contact block and light unit mounting for up to 10 circuits. The standard 3-way mounting adapter E22BA1 allows up to 6 circuits.</p> <p>For non-illuminated PBs, 2-position selector switches and 2-position Push-Pulls</p> <p>For illuminated PBs, 2-position selector switches and 2-position Push-Pulls</p> <p>For non-illuminated 3-position selector switches with Cam #1</p> <p>For illuminated 3-position selector switches with Cam #1</p>	<p>E22BA11</p> <p>E22BA11L</p> <p>E22BA12</p> <p>E22BA12L</p>

① Cannot be used with 3-position Push-Pull operators, Cam #2 3-position selector switches, push-push operators, trigger action pushbutton or E22B4/E22BF4 contact blocks. See Table 2-104.

Table 2-104. 5-Way Mounting Adapter Selection Chart

Front of Panel Devices	Back of Panel Options			
	Non-illuminated		Illuminated	
	E22BA11	E22BA12	E22BA11L	E22BA12L
Flush and Extended Pushbuttons	✓	—	✓ ^②	—
28, 40, 50 mm Mushroom (Momentary)	✓	—	—	—
50 mm Mushroom Latch (Pull-to-Release)	✓	—	✓ ^②	—
40 mm Mushroom Latch (Key Release)	✓ ^②	—	—	—
28 and 40 mm Mushroom Latch (Twist-to-Release)	✓ ^②	—	—	—
29.5 and 40 mm 2-Position Push-Pull	✓	—	✓ ^②	—
29.5 and 40 mm 3-Position Push-Pull	—	—	—	—
Double Headed Pushbutton	—	—	—	—
2-Position Selector Switch — Cam 2	✓	—	✓ ^②	—
3-Position Selector Switch — Cam 1	—	✓	—	✓ ^②
3-Position Selector Switch — Cam 2	—	—	—	—
Trigger Action Pushbutton	—	—	—	—
Push-Push Operator	—	—	—	—

② Four single circuit contact blocks maximum.

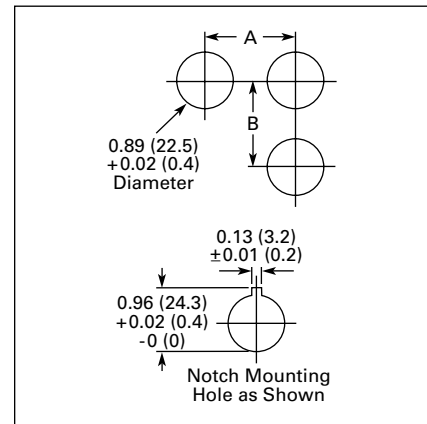


Figure 2-10. Minimum Spacing in Inches (mm)

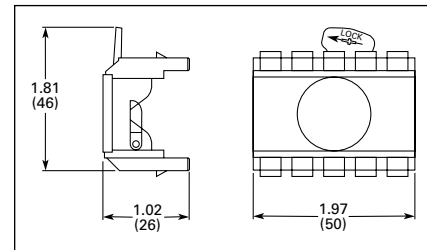


Figure 2-11. Overall Dimensions in Inches (mm)

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E22 and EM22 Series, Accessories and Replacement Parts




Accessories (Continued)

Table 2-105. E22 Series Accessories (Continued)

Description		Catalogue Number
Octagonal Mounting Nut 15-1438		
	Moulded Black Bezel — For converting chrome bezel to black bezel — Suitable for Knob, Lever and Key Selector Switches	E22AZB
	Chrome Bezel — Suitable for Knob, Lever and Key Selector Switches	28-6028
	Lenses with Octagonal Bezel for 25 mm Diameter Flush Illuminated Pushbutton — 10 per package, minimum order 10.	Red Green Blue Clear Amber White Yellow E22ADR E22ADG E22ADV E22ADC E22ADA E22ADW E22ADY
	Lenses with Octagonal Bezel for 25 mm Diameter Extended Illuminated Pushbuttons — 10 per package, minimum order 10.	Red Green Blue Clear Amber White Yellow E22AER E22AEG E22AEV E22AEC E22AEA E22AEW E22AEY
	Colour Caps with Octagonal Bezel for Standard Non-illuminated 25 mm Diameter Flush Pushbuttons — 10 per package, minimum order 10.	Red Green Blue White Yellow Black Grey Orange E22ABR E22ABG E22ABV E22ABW E22ABY E22ABB E22ABE E22ABN
	Colour Caps with Octagonal Bezel for Standard Non-illuminated 25 mm Diameter Extended Pushbuttons — 10 per package, minimum order 10.	Red Green Blue White Yellow Black Grey Orange E22ACR E22ACG E22ACV E22ACW E22ACY E22ACB E22ACE E22ACN

Replacement Parts

Table 2-106. Replacement Lenses — Indicating Lights

Colour	Standard Indicating Light	For Use with Insert ^①	Glass Lens
			
	Catalogue Number	Catalogue Number	Catalogue Number
Clear	E22AE0	E22AG0	E22AC0
Red	E22AE2	E22AG2	E22AC2
Green	E22AE3	E22AG3	E22AC3
Yellow	E22AE4	E22AG4	E22AC4
White	E22AE5	E22AG5	E22AC5
Blue	E22AE6	E22AG6	E22AC6
Amber	E22AE9	E22AG9	E22AC9

^① Plastic indicating light lens with insert suitable for printed legends. For replacement Indicating Light Legend Inserts, order E22AL5. Minimum order quantity 10 pieces.

Table 2-107. Replacement Caps — Push-Pull







Description	1.16 Inches (29.5 mm)	1.57 Inches (40 mm)	
	Catalogue Number	Catalogue Number	
Non-illuminated			
	Black Red Green Yellow White	E22AHS1 E22AHS2 E22AHS3 E22AHS4 E22AHS5	E22AH1 E22AH2 E22AH3 E22AH4 E22AH5
	Blue Grey Amber Red EMERGENCY STOP	E22AHS6 E22AHS7 E22AHS8 —	E22AH6 E22AH7 E22AH8 E22AH2N8
Illuminated			
	Clear Red Green Yellow White	E22AFS0 E22AFS2 E22AFS3 E22AFS4 E22AFS5	E22AF0 E22AF2 E22AF3 E22AF4 E22AF5
	Blue Amber Red EMERGENCY STOP	E22AFS6 E22AFS9 —	E22AF6 E22AF9 E22AF2N8

Table 2-108. Replacement Selector Switch Levers and Knobs

Colour	Levers	Knobs		
				
				
	Catalogue Number	Catalogue Number		
Non-illuminated — 45° Throw				
Black	E22AV1	E22AV21		
Red	E22AV2	E22AV22		
Green	E22AV3	E22AV23		
Yellow	E22AV4	E22AV24		
White	E22AV5	E22AV25		
Blue	E22AV6	E22AV26		
Grey	E22AV7	E22AV27		
Orange	E22AV8	E22AV28		
	E22AX1	E22AX21		
	E22AX2	E22AX22		
	E22AX3	E22AX23		
	E22AX4	E22AX24		
	E22AX5	E22AX25		
	E22AX6	E22AX26		
	E22AX7	E22AX27		
	E22AX8	E22AX28		
Illuminated — 45° Throw				
Clear	E22AW0	E22AW20		
Red	E22AW2	E22AW22		
Green	E22AW3	E22AW23		
Yellow	E22AW4	E22AW24		
White	E22AW5	E22AW25		
Blue	E22AW6	E22AW26		
Amber	E22AW9	E22AW29		
	E22AR0	E22AR20		
	E22AR2	E22AR22		
	E22AR3	E22AR23		
	E22AR4	E22AR24		
	E22AR5	E22AR25		
	E22AR6	E22AR26		
	E22AR9	E22AR29		
Non-illuminated — 60° Throw				
Black	53-4122-36	53-4183-36	53-4185-36	53-4184-36
Red	53-4122-31	53-4183-31	53-4185-31	53-4184-31
Green	53-4122-32	53-4183-32	53-4185-32	53-4184-32
Yellow	53-4122-34	53-4183-34	53-4185-34	53-4184-34
White	53-4122-35	53-4183-35	53-4185-35	53-4184-35
Blue	53-4122-33	53-4183-33	53-4185-33	53-4184-33
Grey	53-4122-37	53-4183-37	53-4185-37	53-4184-37
Orange	53-4122-38	53-4183-38	53-4185-38	53-4184-38
Illuminated — 60° Throw				
Clear	53-4122-26	53-4183-26	53-4185-26	53-4184-26
Red	53-4122-21	53-4183-21	53-4185-21	53-4184-21
Green	53-4122-22	53-4183-22	53-4185-22	53-4184-22
Yellow	53-4122-24	53-4183-24	53-4185-24	53-4184-24
White	53-4122-25	53-4183-25	53-4185-25	53-4184-25
Blue	53-4122-23	53-4183-23	53-4185-23	53-4184-23
Amber	53-4122-27	53-4183-27	53-4185-27	53-4184-27
Four- to Eight-Position Selector Switches — Non-illuminated				
Black	53-2617-16		53-2620-16	

E22 and EM22 Series, Legend Plates with Standard Markings

Options

Legend Plates

Engraved Legend Plates with Standard Markings — 1/8" High Character Size

Aluminum — Aluminum legend plates have a plastisol backing to help prevent rotation of the operator when installed in an unnotched hole. Operators

installed with aluminum legend plates and legend plates with clip-in inserts maintain their UL Listed Type 4-4X-13 rating.

Plastic — Both the laminated plastic legend plates and legend plates with clip-in inserts offer the choice of four background colours. Either side of the legend plate or insert can be field engraved.

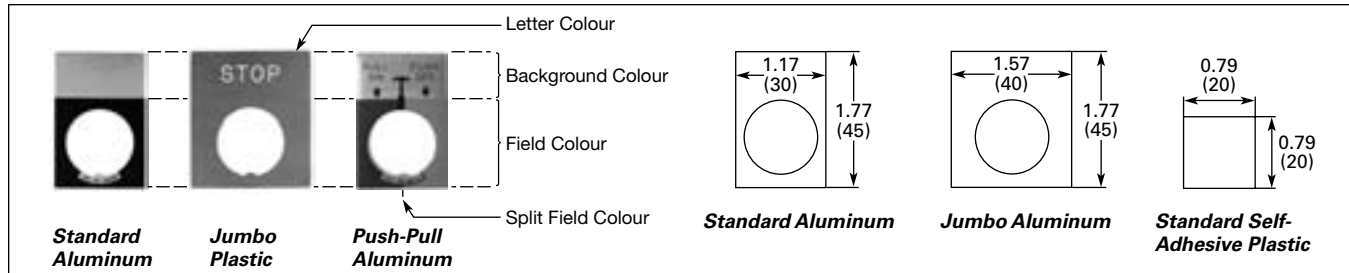


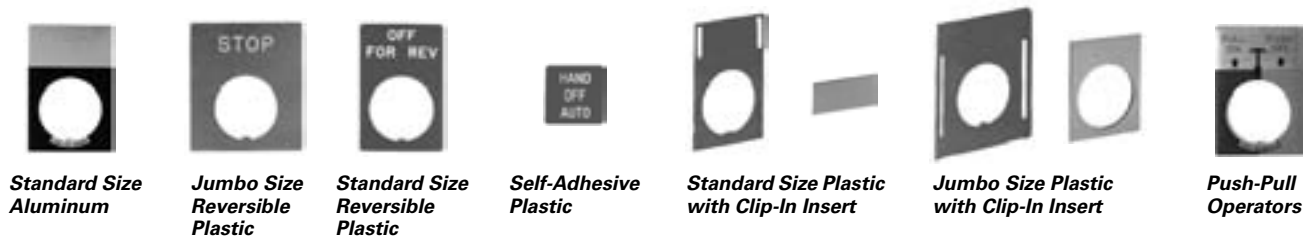
Figure 2-12. Colour Diagram and Approximate Dimensions in Inches (mm)

Table 2-109. Engraved Legend Plates

Nameplate Type	Standard Aluminum with Plastisol Backing NEMA 3, 3R, 4, 4X, 12, 13 and Self-Adhesives used on Enclosures ①②		Standard Plastic, NEMA 1 Only ①				
Letter Colour	Black	Silver	White	Black	White	Red	Black
Background Colour	Silver	Black	Black	Black	White	Red	White
Field Colour	Black	Black	Black	Black	White	Red	White
Pushbutton							
(No Engraving)	E22NS36	E22NS37	E22NSP77	E22NSP77	E22NSP76	E22NSP76	E22NSP76
CLAMP	E22NS90	—	E22NSP90	E22NSP90R	E22NSP90W	E22NSP90S	E22NSP90S
CLOSE	E22NS11	—	E22NSP11	E22NSP11R	E22NSP11W	E22NSP11S	E22NSP11S
DOWN	E22NS12	—	E22NSP12	E22NSP12R	E22NSP12W	E22NSP12S	E22NSP12S
EMERG. STOP	—	E22NS13	—	E22NSP13R	—	—	—
FAST	E22NS14	—	E22NSP14	E22NSP14R	E22NSP14W	E22NSP14S	E22NSP14S
FASTER	E22NS87	—	E22NSP87	E22NSP87R	E22NSP87W	E22NSP87S	E22NSP87S
FEEDER OFF	E22NS95	—	E22NSP95	E22NSP95R	E22NSP95W	E22NSP95S	E22NSP95S
FEEDER ON	E22NS94	—	E22NSP94	E22NSP94R	E22NSP94W	E22NSP94S	E22NSP94S
FOR	E22NS4	—	E22NSP4	E22NSP4R	E22NSP4W	E22NSP4S	E22NSP4S
FORWARD	E22NS15	—	E22NSP15	E22NSP15R	E22NSP15W	E22NSP15S	E22NSP15S
HIGH	E22NS16	—	E22NSP16	E22NSP16R	E22NSP16W	E22NSP16S	E22NSP16S
IN	E22NS17	—	E22NSP17	E22NSP17R	E22NSP17W	E22NSP17S	E22NSP17S
INCH	E22NS18	—	E22NSP18	E22NSP18R	E22NSP18W	E22NSP18S	E22NSP18S
JOG	E22NS19	—	E22NSP19	E22NSP19R	E22NSP19W	E22NSP19S	E22NSP19S

① To order Jumbo Legend Plates replace the 5th character with an L. For example E22NL87 is an aluminum, Jumbo Legend Plate marked "FASTER".

② To order self-adhesive legend plates replace the 5th character with a C. For example E22NC87 is a Self-Adhesive Legend Plate marked "FASTER".



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E22 and EM22 Series, Legend Plates with Standard Markings

Table 2-109. Engraved Legend Plates (Continued)

Nameplate Type	Standard Aluminum with Plastisol Backing NEMA 3, 3R, 4, 4X, 12, 13 and Self-Adhesives used on Enclosures ①②		Standard Plastic, NEMA 1 Only ①			
Letter Colour	Black	Black	White	White	Black	Black
Background Colour	Silver	Silver	Black	Red	White	Silver
Field Colour	Black	Red	Black	Red	White	Silver

Pushbutton (Cont.)

JOG FOR	E22NS96	—	E22NSP96	E22NSP96R	E22NSP96W	E22NSP96S
JOG REV	E22NS21	—	E22NSP21	E22NSP21R	E22NSP21W	E22NSP21S
LEFT	E22NS10	—	E22NSP10	E22NSP10R	E22NSP10W	E22NSP10S
LOW	E22NS22	—	E22NSP22	E22NSP22R	E22NSP22W	E22NSP22S
LOWER	E22NS23	—	E22NSP23	E22NSP23R	E22NSP23W	E22NSP23S
LUBE FAIL	E22NS92	—	E22NSP92	E22NSP92R	E22NSP92W	E22NSP92S
MOTOR RUN	E22NS81	—	E22NSP81	E22NSP81R	E22NSP81W	E22NSP81S
MOTOR RUNNING	E22NS56	—	E22NSP56	E22NSP56R	E22NSP56W	E22NSP56S
MOTOR STOP	E22NS82	—	E22NSP82	E22NSP82R	E22NSP82W	E22NSP82S
MOTOR STOPPED	E22NS57	—	E22NSP57	E22NSP57R	E22NSP57W	E22NSP57S
O	—	E22NS64	—	E22NSP64R	—	—
OFF	—	E22NS24	—	E22NSP24R	—	—
ON	E22NS25	—	E22NSP25	E22NSP25R	E22NSP25W	E22NSP25S
I	E22NS65	—	E22NSP65	E22NSP65R	E22NSP65W	E22NSP65S
OPEN	E22NS26	—	E22NSP26	E22NSP26R	E22NSP26W	E22NSP26S
OUT	E22NS27	—	E22NSP27	E22NSP27R	E22NSP27W	E22NSP27S
OVERLOAD TRIPPED	E22NS98	—	E22NSP98	E22NSP98R	E22NSP98W	E22NSP98S
OVERLOAD RESET	E22NS100	—	E22NSP100	E22NSP100R	E22NSP100W	E22NSP100S
POWER ON	E22NS80	—	E22NSP80	E22NSP80R	E22NSP80W	E22NSP80S
RAISE	E22NS28	—	E22NSP28	E22NSP28R	E22NSP28W	E22NSP28S
READY	E22NS86	—	E22NSP86	E22NSP86R	E22NSP86W	E22NSP86S
RESET	E22NS29	—	E22NSP29	E22NSP29R	E22NSP29W	E22NSP29S
REV	E22NS5	—	E22NSP5	E22NSP5R	E22NSP5W	E22NSP5S
REVERSE	E22NS30	—	E22NSP30	E22NSP30R	E22NSP30W	E22NSP30S
RIGHT	E22NS79	—	E22NSP79	E22NSP79R	E22NSP79W	E22NSP79S
RUN	E22NS31	—	E22NSP31	E22NSP31R	E22NSP31W	E22NSP31S
SAFE	E22NS85	—	E22NSP85	E22NSP85R	E22NSP85W	E22NSP85S
SLOW	E22NS32	—	E22NSP32	E22NSP32R	E22NSP32W	E22NSP32S
SLOWER	E22NS88	—	E22NSP88	E22NSP88R	E22NSP88W	E22NSP88S
START	E22NS33	—	E22NSP33	E22NSP33R	E22NSP33W	E22NSP33S
STOP	—	E22NS34	—	E22NSP34R	—	—
SUPPLY ON	E22NS61	—	E22NSP61	E22NSP61R	E22NSP61W	E22NSP61S
TEST	E22NS83	—	E22NSP83	E22NSP83R	E22NSP83W	E22NSP83S
TRANSFER	E22NS93	—	E22NSP93	E22NSP93R	E22NSP93W	E22NSP93S
TRIP	E22NS84	—	E22NSP84	E22NSP84R	E22NSP84W	E22NSP84S
UNCLAMP	E22NS91	—	E22NSP91	E22NSP91R	E22NSP91W	E22NSP91S
UP	E22NS35	—	E22NSP35	E22NSP35R	E22NSP35W	E22NSP35S

2-Position Selector Switch

INCH/REVERSE	E22NS59	—	E22NSP59	E22NSP59R	E22NSP59W	E22NSP59S
FOR/REV ↘	E22NS101	—	E22NSP101	E22NSP101R	E22NSP101W	E22NSP101S
FOR/REV ↙	E22NS38	—	E22NSP38	E22NSP38R	E22NSP38W	E22NSP38S
HAND/AUTO ↘	E22NS102	—	E22NSP102	E22NSP102R	E22NSP102W	E22NSP102S
HAND/AUTO ↙	E22NS39	—	E22NSP39	E22NSP39R	E22NSP39W	E22NSP39S
HIGH/LOW ↘	E22NS103	—	E22NSP103	E22NSP103R	E22NSP103W	E22NSP103S
HIGH/LOW ↙	E22NS40	—	E22NSP40	E22NSP40R	E22NSP40W	E22NSP40S
INCH/RUN ↘	E22NS114	—	E22NSP114	E22NSP114R	E22NSP114W	E22NSP114S
INCH/RUN ↙	E22NS60	—	E22NSP60	E22NSP60R	E22NSP60W	E22NSP60S
JOG/RUN ↘	E22NS104	—	E22NSP104	E22NSP104R	E22NSP104W	E22NSP104S
JOG/RUN ↙	E22NS41	—	E22NSP41	E22NSP41R	E22NSP41W	E22NSP41S
LEFT/RIGHT ↘	E22NS117	—	E22NSP117	E22NSP117R	E22NSP117W	E22NSP117S
LEFT/RIGHT ↙	E22NS66	—	E22NSP66	E22NSP66R	E22NSP66W	E22NSP66S
LOC/REM ↘	E22NS116	—	E22NSP116	E22NSP116R	E22NSP116W	E22NSP116S
LOC/REMOTE ↙	E22NS63	—	E22NSP63	E22NSP63R	E22NSP63W	E22NSP63S

① To order Jumbo Legend Plates replace the 5th character with an L. For example E22NL87 is an aluminum, Jumbo Legend Plate marked "FASTER".

② To order self-adhesive legend plates replace the 5th character with a C. For example E22NC87 is a Self-Adhesive Legend Plate marked "FASTER".

↘ Centre to Right Throw — 45° or 60° travel.

↙ Left to Right Throw — 45° or 60° travel.

E22 and EM22 Series, Legend Plates with Standard Markings

Table 2-109. Engraved Legend Plates (Continued)

Nameplate Type	Standard Aluminum with Plastisol Backing NEMA 3, 3R, 4, 4X, 12, 13 and Self-Adhesives used on Enclosures ①②		Standard Plastic, NEMA 1 Only ①			
Letter Colour	Black	Black	White	White	Black	Black
Background Colour	Silver	Silver	Black	Red	White	White
Field Colour	Black	Red	Black	Red	White	Silver

2-Position Selector Switch (Cont.)

MAN/AUTO ↗	E22NS118	—	E22NSP118	E22NSP118R	E22NSP118W	E22NSP118S
MAN/AUTO ↘	E22NS67	—	E22NSP67	E22NSP67R	E22NSP67W	E22NSP67S
O/I ↗	E22NS120	—	E22NSP120	E22NSP120R	E22NSP120W	E22NSP120S
O/I ↘	E22NS122	—	E22NSP122	E22NSP122R	E22NSP122W	E22NSP122S
OFF/ON ↗	E22NS105	—	E22NSP105	E22NSP105R	E22NSP105W	E22NSP105S
OFF/ON ↘	E22NS42	—	E22NSP42	E22NSP42R	E22NSP42W	E22NSP42S
OPEN/CLOSE ↗	E22NS106	—	E22NSP106	E22NSP106R	E22NSP106W	E22NSP106S
OPEN/CLOSE ↘	E22NS43	—	E22NSP43	E22NSP43R	E22NSP43W	E22NSP43S
RUN/JOG ↗	E22NS107	—	E22NSP107	E22NSP107R	E22NSP107W	E22NSP107S
RUN/JOG ↘	E22NS44	—	E22NSP44	E22NSP44R	E22NSP44W	E22NSP44S
SAFE/RUN ↗	E22NS108	—	E22NSP108	E22NSP108R	E22NSP108W	E22NSP108S
SAFE/RUN ↘	E22NS45	—	E22NSP45	E22NSP45R	E22NSP45W	E22NSP45S
SEQ/TEST ↗	E22NS115	—	E22NSP115	E22NSP115R	E22NSP115W	E22NSP115S
SEQ/TEST ↘	E22NS62	—	E22NSP62	E22NSP62R	E22NSP62W	E22NSP62S
START/JOG ↗	E22NS109	—	E22NSP109	E22NSP109R	E22NSP109W	E22NSP109S
START/JOG ↘	E22NS46	—	E22NSP46	E22NSP46R	E22NSP46W	E22NSP46S
START/STOP ↗	E22NS110	—	E22NSP110	E22NSP110R	E22NSP110W	E22NSP110S
START/STOP ↘	E22NS47	—	E22NSP47	E22NSP47R	E22NSP47W	E22NSP47S
STOP/RESET ↗	—	E22NS112	—	E22NSP112R	—	—
STOP/RESET ↘	—	E22NS58	—	E22NSP58R	—	—
UP/DOWN ↗	E22NS111	—	E22NSP111	E22NSP111R	E22NSP111W	E22NSP111S
UP/DOWN ↘	E22NS48	—	E22NSP48	E22NSP48R	E22NSP48W	E22NSP48S

3-Position Selector Switch

AUTO/OFF/HAND	E22NS49	—	E22NSP49	E22NSP49R	E22NSP49W	E22NSP49S
FOR/OFF/REV	E22NS50	—	E22NSP50	E22NSP50R	E22NSP50W	E22NSP50S
FOR/SAFE/REV	E22NS69	—	E22NSP69	E22NSP69R	E22NSP69W	E22NSP69S
HAND/OFF/AUTO	E22NS51	—	E22NSP51	E22NSP51R	E22NSP51W	E22NSP51S
I/O/II	E22NS121	—	E22NSP121	E22NSP121R	E22NSP121W	E22NSP121S
MAN/OFF/AUTO	E22NS68	—	E22NSP68	E22NSP68R	E22NSP68W	E22NSP68S
ON/STOP/SAFE	—	E22NS71	—	E22NSP71R	—	—
OPEN/OFF/CLOSE	E22NS53	—	E22NSP53	E22NSP53R	E22NSP53W	E22NSP53S
RUN/SAFE/JOE	E22NS70	—	E22NSP70	E22NSP70R	E22NSP70W	E22NSP70S
UP/OFF/DOWN	E22NS54	—	E22NSP54	E22NSP54R	E22NSP54W	E22NSP54S

Push-Pulls Only ③

Pull-ON Push-OFF	—	E22NP73	E22NSP73	E22NSP73R	E22NSP73W	E22NSP73S
Pull-START Push-STOP	—	E22NP75	E22NSP75	E22NSP75R	E22NSP75W	E22NSP75S

① To order Jumbo Legend Plates replace the 5th character with an L. For example E22NL87 is an aluminum, Jumbo Legend Plate marked "FASTER".

② To order self-adhesive legend plates replace the 5th character with a C. For example E22NC87 is a Self-Adhesive Legend Plate marked "FASTER".

③ Field Colour is Split, green on the left side, red on the right side.

↗ Centre to Right Throw — 45° or 60° travel.

↘ Left to Right Throw — 45° or 60° travel.

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E22 and EM22 Series, Legend Plates and Legend Plate Carriers

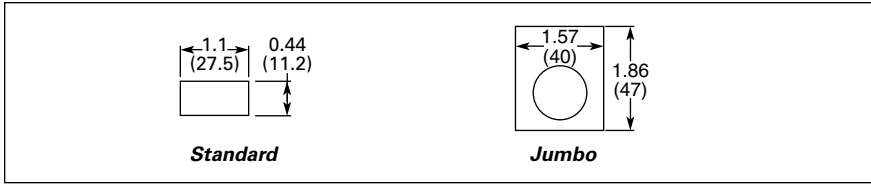


Figure 2-13. Approximate Dimensions in Inches (mm)

Table 2-110. Legend Plates and Legend Plate Carriers

Nameplate Type	Plastic with Clip-In Insert without Carrier NEMA 3, 3R, 4, 4X, 12, 13 ①			
Letter Colour	White	White	Black	Black
Background Colour	Black	Red	White	Silver
Field Colour	Black	Red	White	Silver

Pushbutton

Legend Plate Carrier ②	E22ND			
(No Engraving)	E22ND77	E22ND77	E22ND76	E22ND76
CLAMP	E22ND90	E22ND90R	E22ND90W	E22ND90S
CLOSE	E22ND11	E22ND11R	E22ND11W	E22ND11S
DOWN	E22ND12	E22ND12R	E22ND12W	E22ND12S
EMERG. STOP	—	E22ND13R	—	—
FAST	E22ND14	E22ND14R	E22ND14W	E22ND14S
FASTER	E22ND87	E22ND87R	E22ND87W	E22ND87S
FEED OFF	E22ND95	E22ND95R	E22ND95W	E22ND95S
FEEDER ON	E22ND94	E22ND94R	E22ND94W	E22ND94S
FOR	E22ND4	E22ND4R	E22ND4W	E22ND4S
FORWARD	E22ND15	E22ND15R	E22ND15W	E22ND15S
HIGH	E22ND16	E22ND16R	E22ND16W	E22ND16S
IN	E22ND17	E22ND17R	E22ND17W	E22ND17S
INCH	E22ND18	E22ND18R	E22ND18W	E22ND18S
JOG	E22ND19	E22ND19R	E22ND19W	E22ND19S
JOG FOR	E22ND96	E22ND96R	E22ND96W	E22ND96S
JOG REV	E22ND21	E22ND21R	E22ND21W	E22ND21S
LEFT	E22ND10	E22ND10R	E22ND10W	E22ND10S
LOW	E22ND22	E22ND22R	E22ND22W	E22ND22S
LOWER	E22ND23	E22ND23R	E22ND23W	E22ND23S
LUBE FAIL	E22ND92	E22ND92R	E22ND92W	E22ND92S
MOTOR RUN	E22ND81	E22ND81R	E22ND81W	E22ND81S
MOTOR RUNNING	E22ND56	E22ND56R	E22ND56W	E22ND56S
MOTOR STOP	E22ND82	E22ND82R	E22ND82W	E22ND82S
MOTOR STOPPED	E22ND57	E22ND57R	E22ND57W	E22ND57S
O	—	E22ND64R	—	—
OFF	—	E22ND24R	—	—
ON	E22ND25	E22ND25R	E22ND25W	E22ND25S
I	E22ND65	E22ND65R	E22ND65W	E22ND65S
OPEN	E22ND26	E22ND26R	E22ND26W	E22ND26S
OUT	E22ND27	E22ND27R	E22ND27W	E22ND27S
OVERLOADTRIPPED	E22ND98	E22ND98R	E22ND98W	E22ND98S
OVERLOAD RESET	E22ND100	E22ND100R	E22ND100W	E22ND100S
POWER ON	E22ND80	E22ND80R	E22ND80W	E22ND80S
RAISE	E22ND28	E22ND28R	E22ND28W	E22ND28S
READY	E22ND86	E22ND86R	E22ND86W	E22ND86S
RESET	E22ND29	E22ND29R	E22ND29W	E22ND29S
REV	E22ND5	E22ND5R	E22ND5W	E22ND5S
REVERSE	E22ND30	E22ND30R	E22ND30W	E22ND30S
RIGHT	E22ND79	E22ND79R	E22ND79W	E22ND79S
RUN	E22ND31	E22ND31R	E22ND31W	E22ND31S
SAFE	E22ND85	E22ND85R	E22ND85W	E22ND85S
SLOW	E22ND32	E22ND32R	E22ND32W	E22ND32S
SLOWER	E22ND88	E22ND88R	E22ND88W	E22ND88S
START	E22ND33	E22ND33R	E22ND33W	E22ND33S

① To order Jumbo Legend Plates and Jumbo Legend Plate Carriers replace the 4th character with a P. For example E22PL87 is an aluminum, Jumbo Legend Plate marked “FASTER”

② One carrier required for each clip-in insert.

E22 and EM22 Series, Legend Plates and Legend Plate Carriers

Table 2-110. Legend Plates and Legend Plate Carriers (Continued)

Nameplate Type	Plastic with Clip-In Insert without Carrier NEMA 3, 3R, 4, 4X, 12, 13 ①			
Letter Colour	White	White	Black	Black
Background Colour	Black	Red	White	Silver
Field Colour	Black	Red	White	Silver



Pushbutton (Cont.)

STOP	—	E22ND34R	—	—
SUPPLY ON	E22ND61	E22ND61R	E22ND61W	E22ND61S
TEST	E22ND83	E22ND83R	E22ND83W	E22ND83S
TRANSFER	E22ND93	E22ND93R	E22ND93W	E22ND93S
TRIP	E22ND84	E22ND84R	E22ND84W	E22ND84S
UNCLAMP	E22ND91	E22ND91R	E22ND91W	E22ND91S
UP	E22ND35	E22ND35R	E22ND35W	E22ND35S

2-Position Selector Switch

INCH/REVERSE	E22ND59	E22ND59R	E22ND59W	E22ND59S
FOR/REV ↗	E22ND101	E22ND101R	E22ND101W	E22ND101S
FOR/REV ↘	E22ND38	E22ND38R	E22ND38W	E22ND38S
HAND/AUTO ↗	E22ND102	E22ND102R	E22ND102W	E22ND102S
HAND/AUTO ↘	E22ND39	E22ND39R	E22ND39W	E22ND39S
HIGH/LOW ↗	E22ND103	E22ND103R	E22ND103W	E22ND103S
HIGH/LOW ↘	E22ND40	E22ND40R	E22ND40W	E22ND40S
INCH/RUN ↗	E22ND114	E22ND114R	E22ND114W	E22ND114S
INCH/RUN ↘	E22ND60	E22ND60R	E22ND60W	E22ND60S
JOG/RUN ↗	E22ND104	E22ND104R	E22ND104W	E22ND104S
JOG/RUN ↘	E22ND41	E22ND41R	E22ND41W	E22ND41S
LEFT/RIGHT ↗	E22ND117	E22ND117R	E22ND117W	E22ND117S
LEFT/RIGHT ↘	E22ND66	E22ND66R	E22ND66W	E22ND66S
LOC/REM ↗	E22ND116	E22ND116R	E22ND116W	E22ND116S
LOC/REMOTE ↘	E22ND63	E22ND63R	E22ND63W	E22ND63S
MAN/AUTO ↗	E22ND118	E22ND118R	E22ND118W	E22ND118S
MAN/AUTO ↘	E22ND67	E22ND67R	E22ND67W	E22ND67S
O/I ↗	E22ND120	E22ND120R	E22ND120W	E22ND120S
O/I ↘	E22ND122	E22ND122R	E22ND122W	E22ND122S
OFF/ON ↗	E22ND105	E22ND105R	E22ND105W	E22ND105S
OFF/ON ↘	E22ND42	E22ND42R	E22ND42W	E22ND42S
OPEN/CLOSE ↗	E22ND106	E22ND106R	E22ND106W	E22ND106S
OPEN/CLOSE ↘	E22ND43	E22ND43R	E22ND43W	E22ND43S
RUN/JOG ↗	E22ND107	E22ND107R	E22ND107W	E22ND107S
RUN/JOG ↘	E22ND44	E22ND44R	E22ND44W	E22ND44S
SAFE/RUN ↗	E22ND108	E22ND108R	E22ND108W	E22ND108S
SAFE/RUN ↘	E22ND45	E22ND45R	E22ND45W	E22ND45S
SEQ/TEST ↗	E22ND115	E22ND115R	E22ND115W	E22ND115S
SEQ/TEST ↘	E22ND62	E22ND62R	E22ND62W	E22ND62S
START/JOG ↗	E22ND109	E22ND109R	E22ND109W	E22ND109S
START/JOG ↘	E22ND46	E22ND46R	E22ND46W	E22ND46S
START/STOP ↗	E22ND110	E22ND110R	E22ND110W	E22ND110S
START/STOP ↘	E22ND47	E22ND47R	E22ND47W	E22ND47S
STOP/RESET ↗	—	E22ND112R	—	—
STOP/RESET ↘	—	E22ND58R	—	—
UP/DOWN ↗	E22ND111	E22ND111R	E22ND111W	E22ND111S
UP/DOWN ↘	E22ND48	E22ND48R	E22ND48W	E22ND48S

3-Position Selector Switch

AUTO/OFF/HAND	E22ND49	E22ND49R	E22ND49W	E22ND49S
FOR/OFF/REV	E22ND50	E22ND50R	E22ND50W	E22ND50S
FOR/SAFE/REV	E22ND69	E22ND69R	E22ND69W	E22ND69S
HAND/OFF/AUTO	E22ND51	E22ND51R	E22ND51W	E22ND51S
I/O/II	E22ND121	E22ND121R	E22ND121W	E22ND121S
MAN/OFF/AUTO	E22ND68	E22ND68R	E22ND68W	E22ND68S
ON/STOP/SAFE	—	E22ND71R	—	—
OPEN/OFF/CLOSE	E22ND53	E22ND53R	E22ND53W	E22ND53S
RUN/SAFE/JOG	E22ND70	E22ND70R	E22ND70W	E22ND70S
UP/OFF/DOWN	E22ND54	E22ND54R	E22ND54W	E22ND54S

① To order Jumbo Legend Plates and Jumbo Legend Plate Carriers replace the 4th character with a P. For example E22PL87 is an aluminum, Jumbo Legend Plate marked "FASTER".

↗ Centre to RightThrow — 45° or 60° travel.

↘ Left to RightThrow — 45° or 60° travel.

Legend Plates with Non-standard Markings
When Ordering Specify

- Catalogue Number of Blank Legend Plate from previous page plus suffix "STAMP"; and describe special engraving in Block Letters.
- Insert the following in Order Notes:
 - Character Size — 3/32, 1/8 or 3/16 inch (2.4, 3.2 or 4.8 mm)
 - Field Colour of Plastic Legend Plates or Insert types.
 - Line location by Number(s) (1 – 17) and legend desired

Note: If legends are required in line locations not specified, drawing must be supplied with order.

Table 2-111. Ordering Examples

Description	Catalogue Number
Aluminum	
Letter Size: 1/8 in. (3.2 mm) Location: 5 – POWER 6 – HOUSE 7 – PUMP	E22NS36STAMP
Plastic	
Letter Size: 3/16 in. (4.8 mm) Field Colour: White Location: 8 – FEEDER 9 – OPEN	E22NLP76STAMP

Table 2-113. Legend Characters Available

ABCDEFGHIJKLMNOPQRSTUVWXYZ /-.1234567890

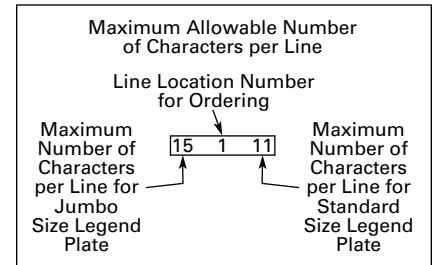


Figure 2-17. How to Use Illustrations

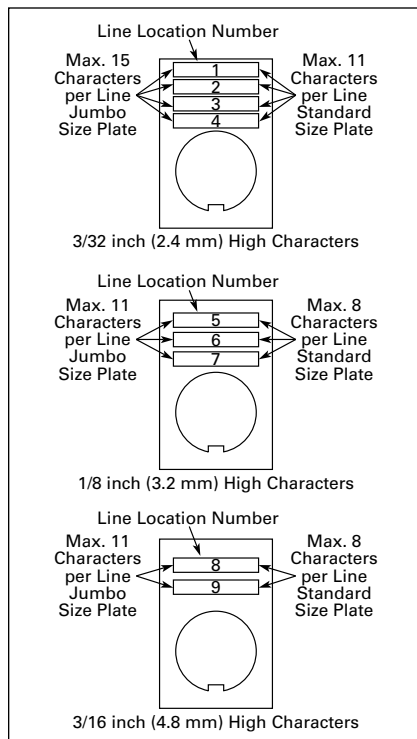


Figure 2-14. Aluminum and Plastic Legend Plates

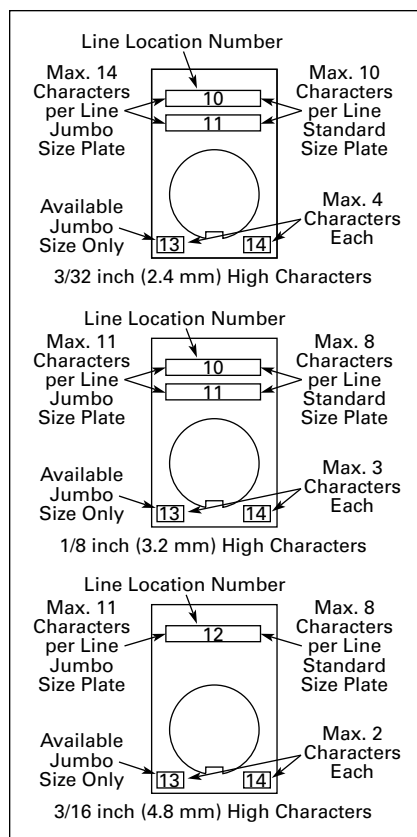


Figure 2-16. Insert Type Plates

Table 2-112. Type of Legend Plate (Used on Selector Switch)

Description	Character Size (Height)		
	3/32 Inch (2.4 mm)	1/8 Inch (3.2 mm)	3/16 Inch (4.8 mm)
Aluminum or Plastic Standard Size	5	3	3
Jumbo Size	7	5	5
Insert Type: Standard Size	5	3	—
Jumbo Size	6	5	—

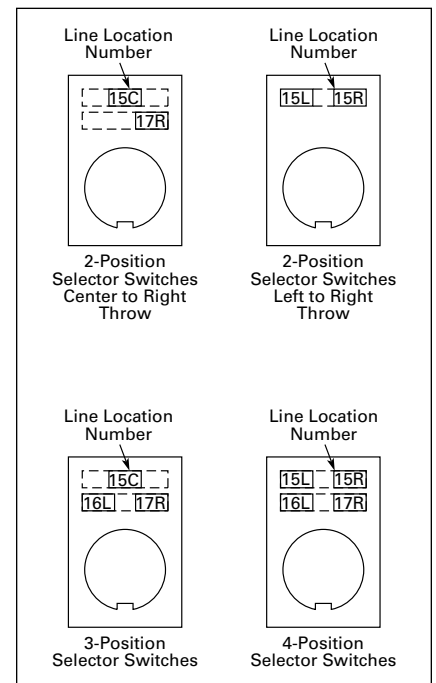


Figure 2-18. Selector Switch Legend Plates

Character Size (Height) Inches	Max. Number of Characters
1/8 Inch (3.2 mm)	6
3/16 Inch (4.8 mm)	5
3/32 Inch (2.4 mm)	8

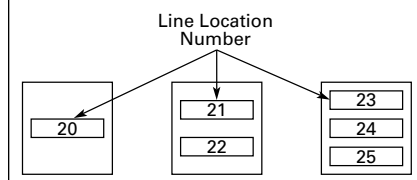


Figure 2-15. Enclosure Legend Plates Self-Adhesive



E22 and EM22 Series, Printed Legends

Printed Legends

For Indicating Lights, Illuminated and Non-illuminated Pushbuttons, and 1.10, 1.57 and 1.97" (28, 40 and 50 mm) (Plastic) Diameter Mushroom Head Operators.

How To Order:

Select legend required from listing below and add Suffix Code Number to Catalogue Number of operator. Example: E22A2**N25** — Red indicating light with insert printed "ON".



Cat. No. **E22A6N5**



Cat. No. **E22EB2N35**

Table 2-114. Printed Legends

Legend ①	Suffix Code Number	Legend ①	Suffix Code Number	Legend ①	Suffix Code Number
FOR	N4	RESET	N29	(Emergency Stop)	N125
REV	N5	RUN	N31	(Start)	N887
↑	N6	START	N33	(Stop)	N888
→	N7	STOP	N34	(Jog)	N889
CLOSE	N11	UP	N35	(Reset)	N890
INCH	N18	0 (Off)	N64	↑	N892
JOG	N19	(On)	N65	↓	N893
OFF	N24	POWER ON	N80	→	N894
ON	N25	READY	N86	←	N895
OPEN	N26	(Push-Push)	N124	(Reset)	N896

① Additional legends and symbols are listed in Table 2-109 on Pages 2-72 – 2-74 — to order as printed legend, add prefix **N** to listed Code Number and follow instructions on how to order above. A one-time set-up charge will apply to all orders for non-listed, special legends.

Legend Plates for Selector Switches

Blank Plastic Legend Plates — Reversible

Legend plates without text. Black one side, red reverse side. White text.

Table 2-115. Blank and Custom Legend Plates

Size Inches (mm)	Catalogue Number
------------------	------------------

Blank

1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)	E22NJP36 E22NGP36
--	------------------------------------

Custom Engraved ①

1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)	E22NJP36STAMP E22NGP36STAMP
--	--

① Custom Engraved Legend Plates have the Suffix **STAMP** added to the Catalogue Number.

Non-standard Legends

To order custom engraved legend plates, specify field colour, add suffix “**STAMP**” to Blank Plate Catalogue Number and specify desired engraving for each position.

Example: E22NGP36**STAMP**,
 OFF - PUMP 1 - PUMP 2 -
 PUMP 3 - PUMP 4, Black field.

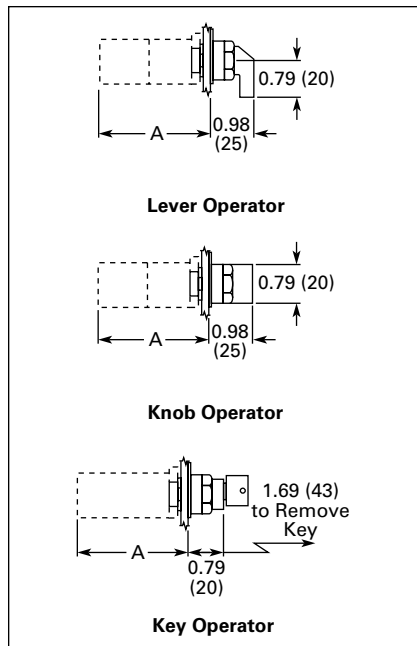


Figure 2-19. Approximate Dimensions in Inches (mm)

Table 2-116. Selector Switch Dimensions

Number of Circuits	Dimension A Inches (mm)
1 - 2	2.83 (72)
3 - 4	3.31 (84)
5 - 6	3.78 (96)
7 - 8	4.25 (108)

Legend Plates with Standard Text

Legend plates have a black background with white lettering.

Table 2-117. Legend Plates with Standard Text

Size Inches (mm)	Switch Positions	Catalogue Number
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP215 E22NGP215
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP216 E22NGP216
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP217 E22NGP217
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP218 E22NGP218
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP219 E22NGP219
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP210 E22NGP210
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP211 E22NGP211
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP212 E22NGP212
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP213 E22NGP213
1.77 x 1.77 (45 x 45) 2.36 x 2.36 (60 x 60)		E22NJP214 E22NGP214







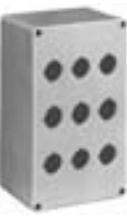
E22 and EM22 Series, Enclosures

Enclosures

These totally insulated, NEMA 4, 4X, 12, 13 rated polycarbonate enclosures are available in 1, 2, 3, 4, 6 and 9 hole configurations in single or double depth. They feature captive, quarter turn screws for fast, easy cover removal — to release, captive screws are pushed-in and turned one quarter turn counterclockwise.

Note: For mounting dimensions and limitations see **Pages 2-81** and **2-87**.

Table 2-118. Enclosures — UL (NEMA) 4, 4X, 12, 13

Cover Holes, Centrelines and Legend Plate Selection	Usable Depth Inches (mm)	Catalogue Number
 Will Accommodate Self-Adhesive Legend Plates Listed on Pages 2-72 – 2-74	2.5 (64) 3.4 (87)	E22CSP1 E22CDP1
 With Safety Yellow Cover	2.2 (57) 3.15 (80)	E22CSP1Y ① E22CDP1Y ①
 1.42 inch (36 mm) Will Accommodate Self-Adhesive Legend Plates Listed on Pages 2-72 – 2-74	2.2 (57) 3.15 (80)	E22CSP2 E22CDP2
 1.42 inch (36 mm) Will Accommodate Self-Adhesive Legend Plates Listed on Pages 2-72 – 2-74	2.2 (57) 3.15 (80)	E22CSP3 E22CDP3
 1.18 inch (30 mm) Will Accommodate Self-Adhesive Legend Plates Listed on Pages 2-72 – 2-74	2.2 (57) 3.15 (80)	E22CSP4 E22CDP4
 Vertical 1.38 inch (35 mm) Horizontal 1.89 inch (48 mm) Will Accommodate Aluminum & Plastic Legend Plates Listed on Pages 2-72 – 2-74	3.15 (80)	E22CDP6
 Vertical 1.97 inch (50 mm) Horizontal 1.38 inch (35 mm) Will Accommodate Aluminum & Plastic Legend Plates Listed on Pages 2-72 – 2-74	3.15 (80)	E22CDP9

① Yellow covers comply with background requirements for EN418 of the European Machinery Directive.

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E22 and EM22 Series, Enclosures

Table 2-119. Enclosure Approximate Dimensions in Inches (mm)

No. of Elements	Outside Dimension				Mounting	
	A	B	C	D	E	F
1	2.75 (70)	2.99 (76)	2.67 (68)	3.54 (90)	2.24 (57)	1.81 (46)
2	3.15 (80)	4.72 (120)	2.36 (60)	3.54 (90)	1.97 (50)	4.09 (108)
3 or 4	3.15 (80)	6.30 (160)	2.36 (60)	3.54 (90)	1.97 (50)	5.82 (148)
6	4.72 (120)	4.80 (122)	—	3.35 (85)	3.54 (90)	4.33 (110)
9	4.72 (120)	7.87 (200)	—	3.54 (90)	3.54 (90)	7.40 (188)

Operator Mounting Dimensions

- Front of Panel — See *Product Selection — Components*
- Rear of Panel — See **Page 2-87**

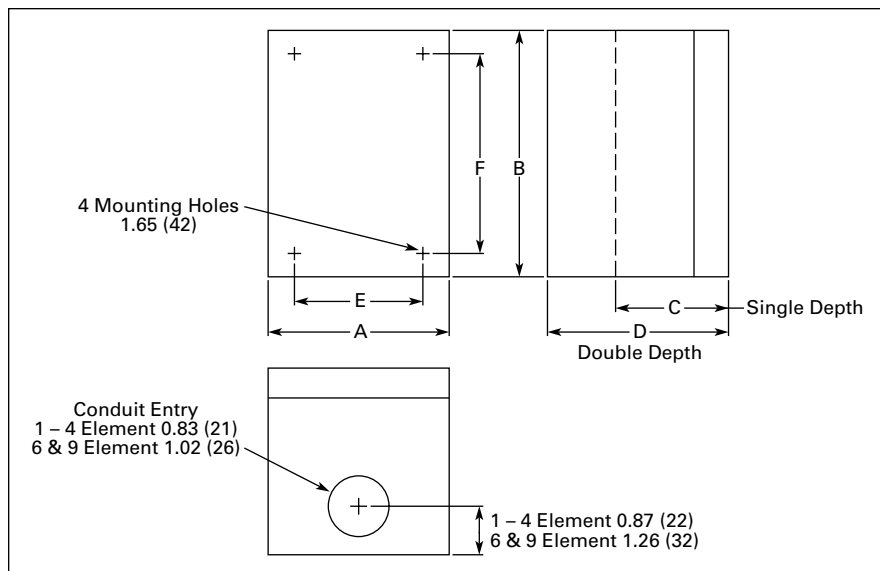


Figure 2-20. Enclosure Dimensions in Inches (mm)

Enclosure Component Application Table

Use the table below to determine which operators will or will not fit in a specific enclosure. For example, a 50 mm mushroom head pushbutton operator will only fit in a 1-hole Cutler-Hammer enclosure.

Table 2-120. Enclosure Component Application

	Number of Holes in Enclosure					
	1	2 ^④	3 ^④	4 ^④	6 ^④	9 ^⑤
Mushroom Head Pushbuttons						
1.14 inch (29 mm)	Yes	Yes	Yes	Yes	Yes	Yes
1.57 inch (40 mm)	Yes	Yes ^①	Yes ^①	Yes ^①	Yes ^①	Yes ^①
1.97 inch (50 mm)	Yes	No	No	No	No	No
Push-Pull Operators						
1.14 inch (29 mm)	Yes	Yes	Yes	Yes	Yes	Yes
1.57 inch (40 mm)	Yes	Yes ^①	Yes ^①	Yes ^①	Yes ^①	Yes ^①
Selector Switch Operators						
Knob	Yes	Yes	Yes	Yes	Yes	Yes
Lever — Vertical ^③	Yes	Yes ^②	Yes ^②	Yes ^②	Yes ^①	Yes ^①
Lever — Horizontal ^③	Yes	Yes ^①	Yes ^①	Yes ^①	Yes ^②	Yes ^②
Key	Yes	Yes	Yes	Yes	Yes	Yes
Illuminated Operators						
With Transformer	No	No	No	No	No	No
5-Way Adapter	Yes	Yes	Yes	Yes	No	No
Over-Sized Yellow Legend Plate						
45 mm	Yes	No	No	No	No	No
70 mm	Yes	No	No	No	No	No

- ① When installed next to standard-sized operator only.
- ② When installed in the bottom position only.
- ③ With conduit entrance at bottom.
- ④ With components mounted horizontally.
- ⑤ With components mounted vertically.

Approximate Dimensions

Note: Approximate dimensions in Inches (mm). For Rear of Panel Extensions. See Table 2-124 on Page 2-87.

Non-illuminated Pushbutton Components

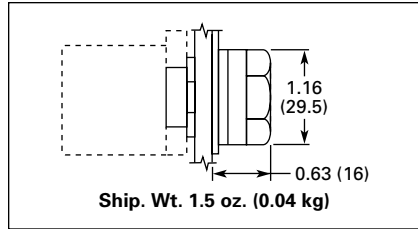


Figure 2-21. E22/EM22 Series 25 mm Dia. Flush Button

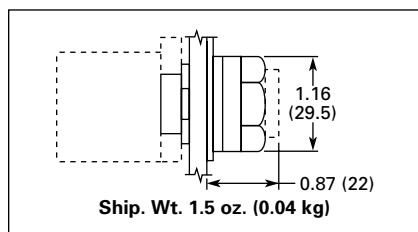


Figure 2-22. E22/EM22 Series 25 mm Dia. Extended Button

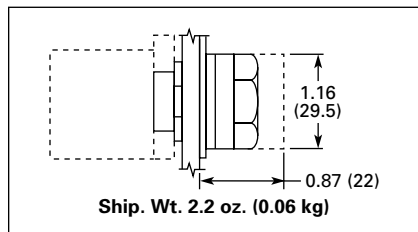


Figure 2-23. E22/EM22 Series 25 mm Dia. with Full Shroud

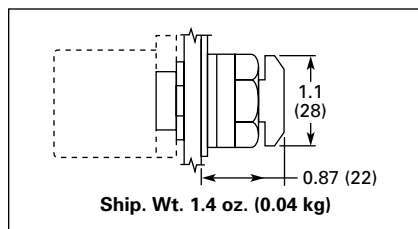


Figure 2-24. E22/EM22 Series 28 mm Dia. Mushroom Head Button

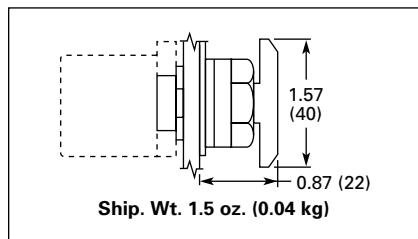


Figure 2-25. E22/EM22 Series 40 mm Dia. Mushroom Head Button

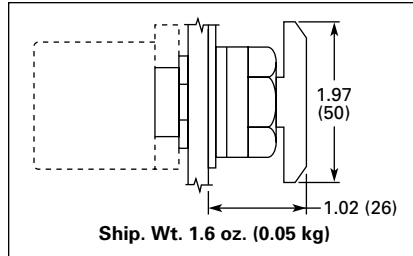


Figure 2-26. E22/EM22 Series 50 mm Dia. Mushroom Head Button

Illuminated Pushbutton Components

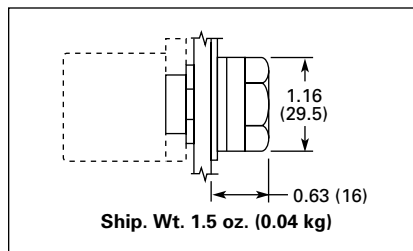


Figure 2-27. E22/EM22 Series 25 mm Dia. Flush Lens

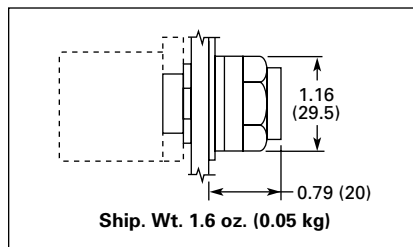


Figure 2-28. E22/EM22 Series 25 mm Dia. Extended Lens

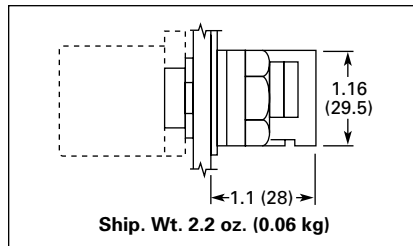


Figure 2-29. E22/EM22 Series 25 mm Dia. Extended Lens with Shroud

Alternate Action (Push-Push) Components

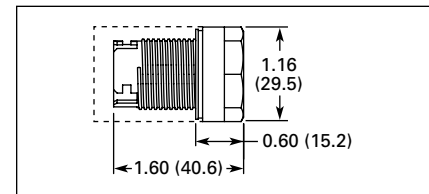


Figure 2-30. E22 Series Non-illuminated Flush Operator

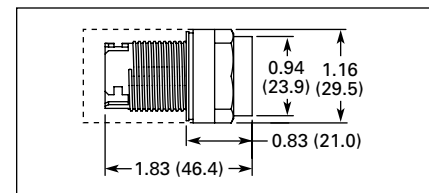


Figure 2-31. E22 Series Non-illuminated Extended Operator

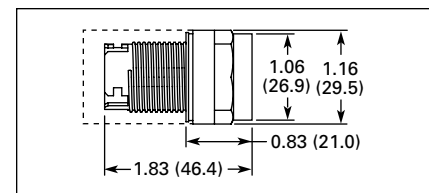


Figure 2-32. E22 Series Illuminated Flush Operator

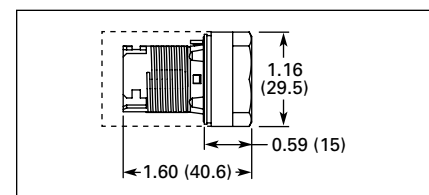


Figure 2-33. EM22 Series Non-Illuminated Flush Operator

E22 and EM22 Series — Dimensions

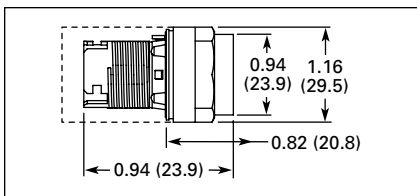


Figure 2-34. EM22 Series Non-illuminated Extended Operator

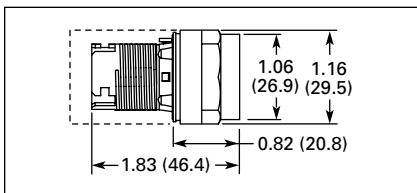


Figure 2-35. EM22 Series Illuminated Flush Operator



Figure 2-36. E22 Series Illuminated Bezel Flush Operator



Figure 2-37. EM22 Series Illuminated Bezel Flush Operator

Table 2-121. Minimum Spacing in Inches (mm)

Size/Type of Operator	Dimensions	
	A ①	B
Push-Push Operators up to 1.18 (30) Dia. Including Knob and Key Operated Selector Switches — except those listed below 3-way adapter	1.18 (30)	1.97 (50)
Pushbutton Operators fitted with Rubber Boots or Padlockable Cover 3-way adapter	1.38 (35)	1.97 (50)

① Horizontal spacing for one 3-way mounting adapter.

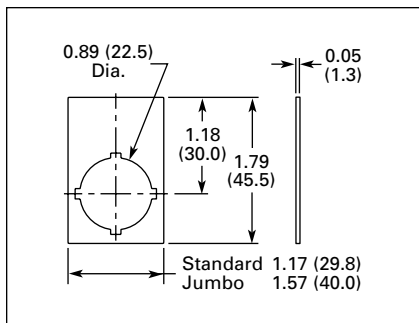
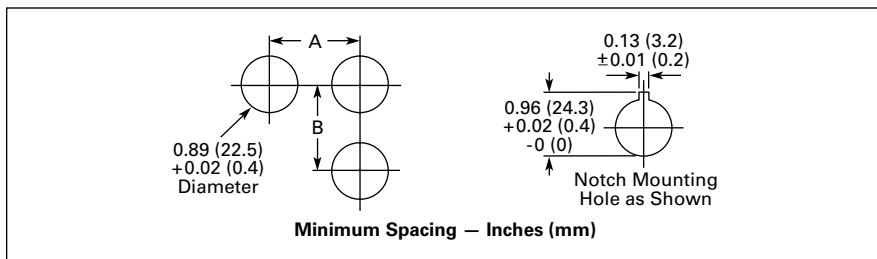


Figure 2-38. Push-Push Nameplate Dimensions

Twist-to-Release, Push-Pull and Key Release Components

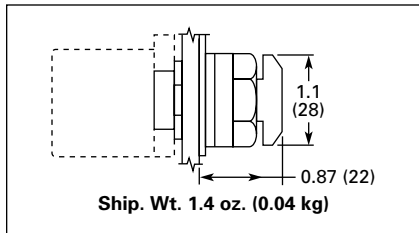


Figure 2-39. E22/EM22 Series 28 mm Diameter Twist-to-Release Button

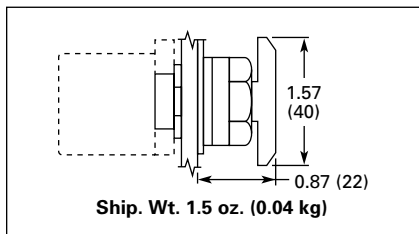


Figure 2-40. E22/EM22 Series 40 mm Dia. Twist-to-Release Button

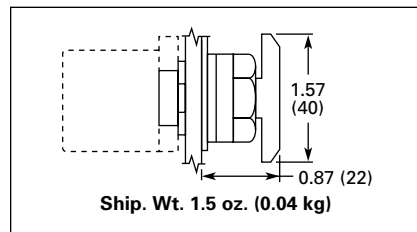


Figure 2-41. E22/EM22 Series 40 mm Dia. Push-Pull Button

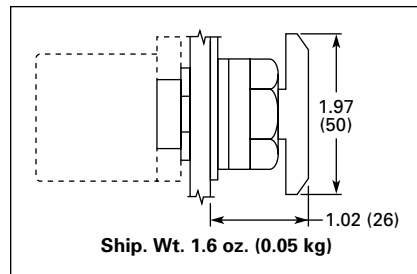


Figure 2-42. E22/EM22 Series 50 mm Dia. Push-Pull Button

E22 and EM22 Series — Dimensions

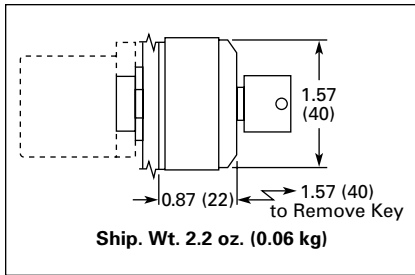


Figure 2-43. E22/EM22 Series 40 mm Dia. Key Release Button

Indicating Light Components

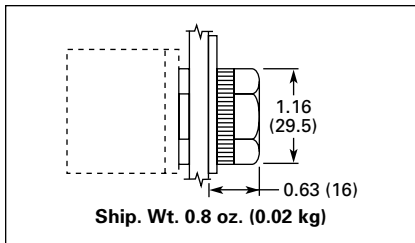


Figure 2-44. E22/EM22 Series 25 mm Dia. Standard Lens

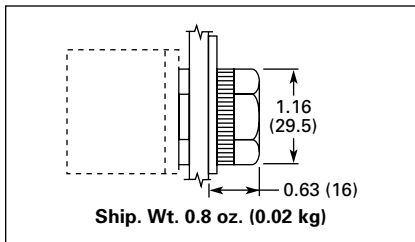


Figure 2-45. E22/EM22 Series 25 mm Dia. Lens Insert Version

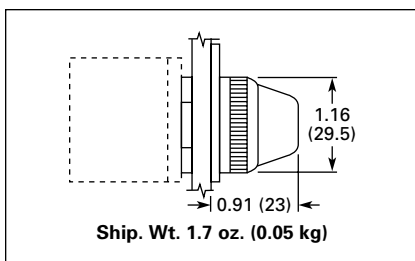


Figure 2-46. E22 Series 25 mm Dia. Glass Lens

Push-Pull Components
Non-illuminated Operators

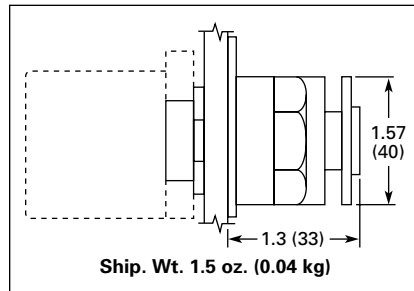


Figure 2-47. E22/EM22 Series 2-Position 40 mm Dia. Button (Maintained)

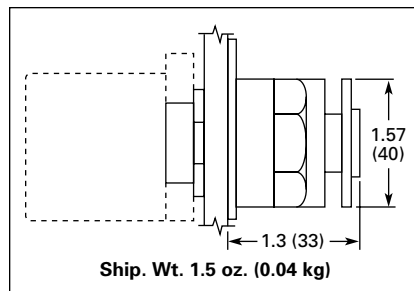


Figure 2-48. E22/EM22 Series 3-Position 40 mm Dia. Button (Spring Return to Centre)

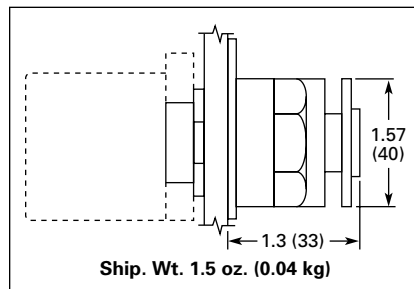


Figure 2-49. E22/EM22 Series 3-Position 40 mm Dia. Push-Pull Pushbutton (Spring Return to Centre from Pulled Position)

Push-Pull Components —
Illuminated Operators

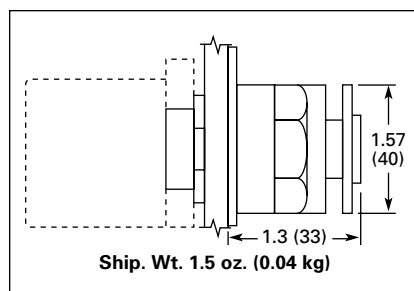


Figure 2-50. E22/EM22 Series 2-Position 40 mm Dia. Lens (Maintained)

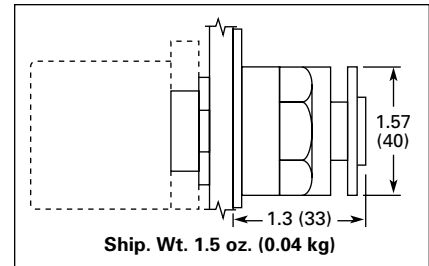


Figure 2-51. E22/EM22 Series 3-Position 40 mm Dia. Lens (Spring Return to Centre)

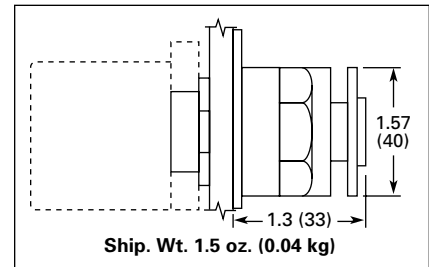


Figure 2-52. E22/EM22 Series 3-Position 40 mm Dia. Push-Pull Pushbutton (Spring Return to Centre from Pulled Position)

Non-illuminated Selector
Switches

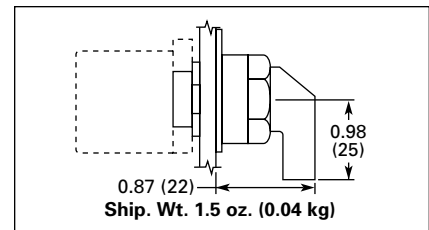


Figure 2-53. E22 Series 2-Position — 45° Throw — Lever

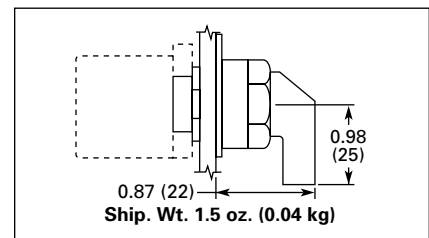


Figure 2-54. E22 Series 3-Position — 45° Throw — Lever

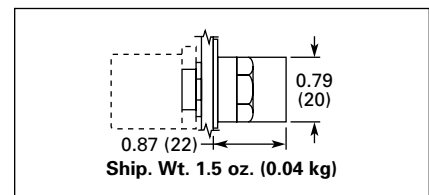
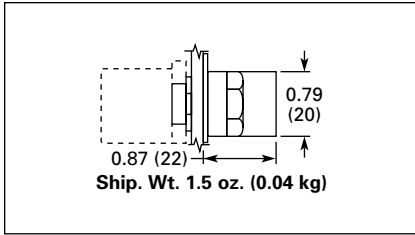
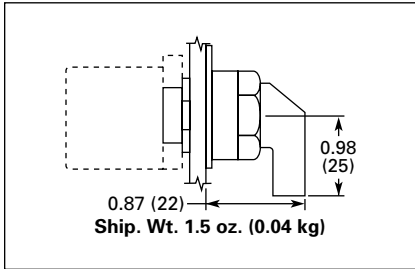


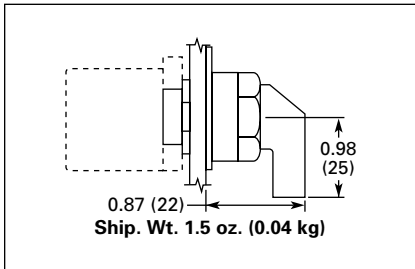
Figure 2-55. E22 Series 2-Position — 45° Throw — Knob



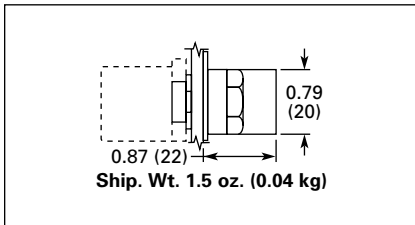
**Figure 2-56. E22 Series 3-Position
45° Throw — Knob**



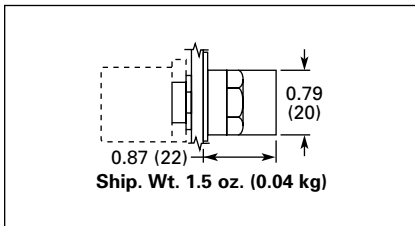
**Figure 2-57. E22/EM22 Series 2-Position
60° Throw — Lever**



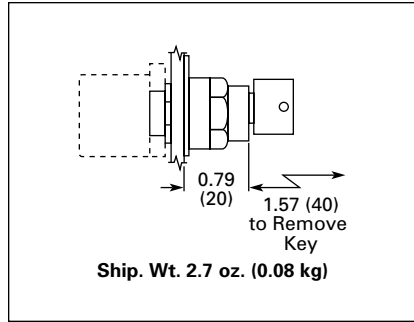
**Figure 2-58. E22/EM22 Series 3-Position
60° Throw — Lever**



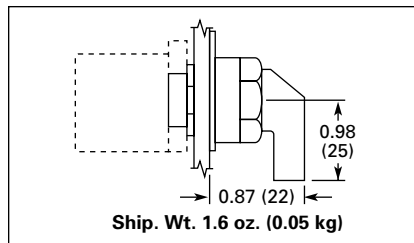
**Figure 2-59. E22/EM22 Series 2-Position
60° Throw — Knob**



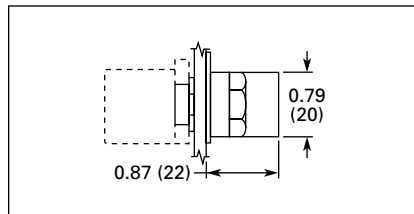
**Figure 2-60. E22/EM22 Series 3-Position
60° Throw — Knob**



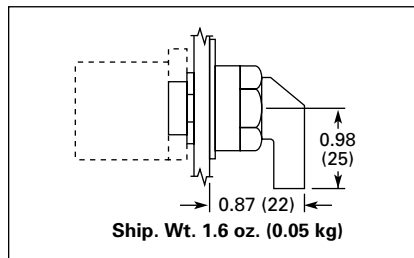
**Figure 2-61. E22/EM22 Series Key Operated
Illuminated Selector Switches**



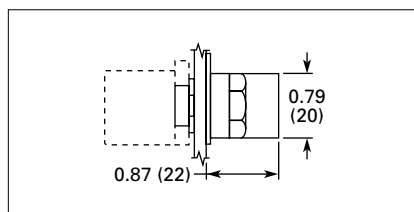
**Figure 2-62. E22 Series 2-Position
45° Throw — Lever**



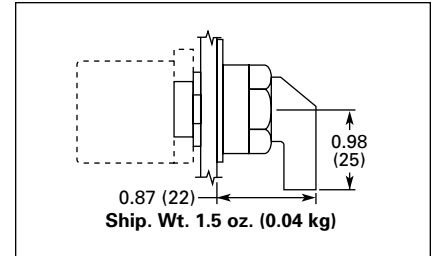
**Figure 2-63. E22 Series 3-Position
45° Throw — Knob**



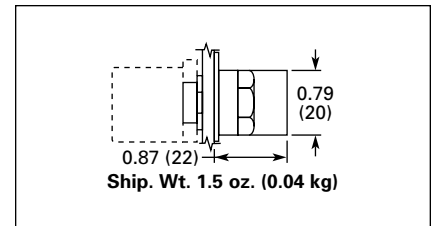
**Figure 2-64. E22 Series 2-Position
60° Throw — Lever**



**Figure 2-65. E22 Series 3-Position
60° Throw — Knob**



**Figure 2-66. EM22 Series
60° Throw — Lever**



**Figure 2-67. EM22 Series
60° Throw — Knob**

Specialty Operators

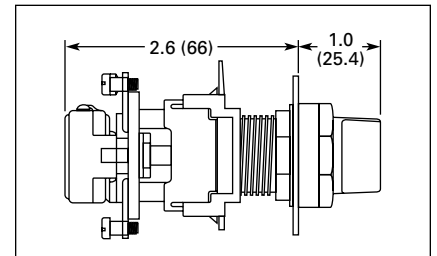
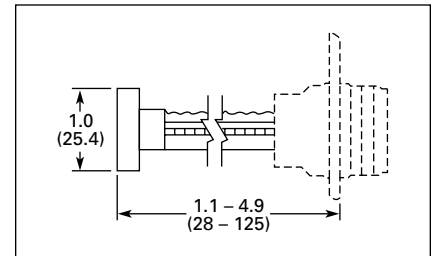


Figure 2-68. Potentiometer with Knob Operator



**Figure 2-69. Flush Pushbutton Operator with
Mechanical Push Rod**

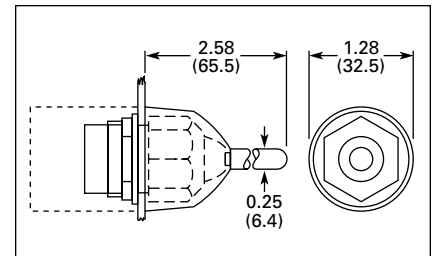


Figure 2-70. Wobble Stick Operator

E22 and EM22 Series — Dimensions

Joystick

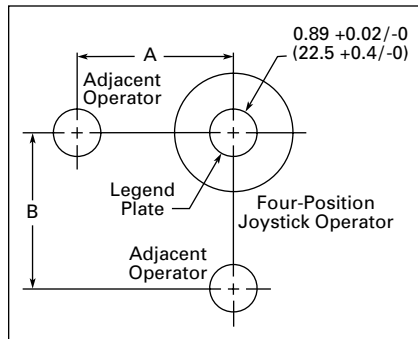


Figure 2-71. Joystick Mounting
 Approximate Dimensions in Inches (mm)

Table 2-122. Minimum Panel Spacing Between 4-Position Joystick and Adjacent Operators in Inches (mm)

Size and Type of Adjacent Operator	A	B
All types except those listed below	2.56 (65)	2.56 (65)
Lever selector switches and 40 mm dia. operators	2.76 (70)	3.15 (80)
50 mm dia. operators	2.95 (75)	2.95 (75)
40 mm dia. emergency stop pushbutton	3.15 (80)	3.15 (80)
Operators with rubber boots or padlockable covers	2.76 (70)	3.35 (85)
40 mm dia. emergency stop pushbutton with 70 mm rectangular guard	3.15 (80)	3.54 (90)
Double head pushbutton	2.76 (70)	3.35 (85)
Four-position joystick operator	3.94 (100)	3.94 (100)

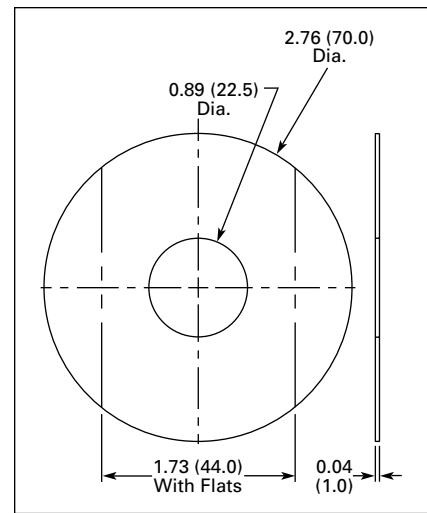


Figure 2-72. Joystick Nameplate Dimensions
 Approximate Dimensions in Inches (mm)

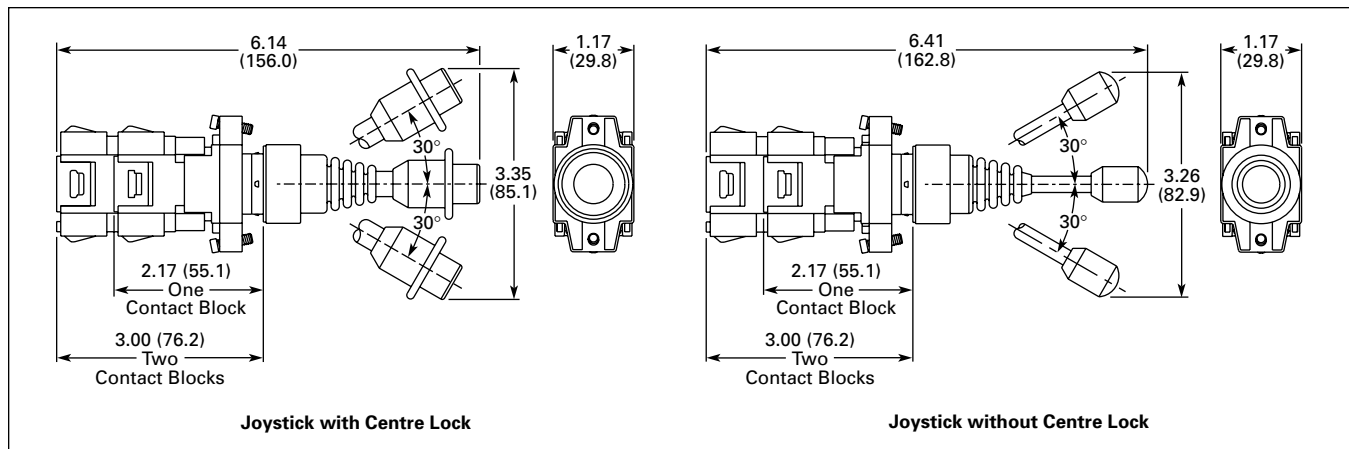


Figure 2-73. Joystick Operator Dimensions — Approximate Dimensions in Inches (mm)

Mounting

■ **Panel thickness — Inches (mm)**

- Nominal: 0.27 (6.8)
 - Legend plates, aluminum or plastic: 0.05 (1.3)
 - Locating ring: 0.06 (1.5)
 - Large yellow round legend plate: 0.04 (1.0)
 - Padlockable cover: 0.06 (1.6)
 - Rubber boot: 0.05 (1.3)

- Minimum: 0.04 (1.0)

Note: Installation of certain accessories will increase the total (overall) panel thickness by the amount shown. The total panel thickness with all accessories installed cannot exceed the maximum allowable nominal dimension of 0.27 inch (6.8 mm).

Table 2-123. Minimum Spacing in Inches (mm)

Size/Type of Operator	Dimensions		
	A ①	A ②	B
All Types up to 1.18 (30) Dia. Including Knob and Key Operated Selector Switches — except those listed below 3-way adapter 5-way adapter	1.18 (30) 1.58 (40)	— 1.97 (50)	1.97 (50) 1.97 (50)
Lever Operated Selector Switch Operators and 1.18 – 1.57 (30 – 40) Dia. Operators	1.77 (45)	1.97 (50)	1.97 (50)
1.97 (50) Dia. Operators	2.16 (55)	2.16 (55)	2.16 (55)
Large Yellow Round Legend Plate — 2.76 (70) Dia.	2.95 (75)	2.95 (75)	2.95 (75)
Pushbutton Operators fitted with Rubber Boots or Padlockable Cover 3-way adapter 5-way adapter	1.38 (35) 1.58 (40)	— 1.97 (50)	1.97 (50) 1.97 (50)

① Horizontal spacing for one 3-way and one 5-way mounting adapter.

② Horizontal spacing for two 5-way mounting adapters.

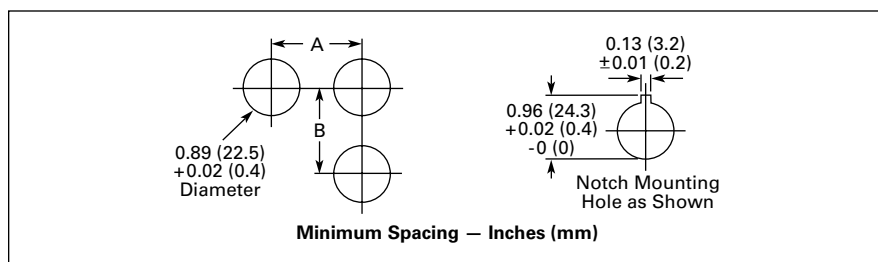


Figure 2-74. Minimum Spacing in Inches (mm)

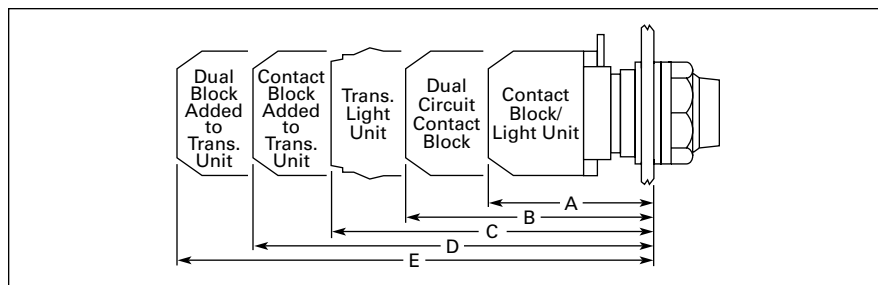


Figure 2-75. Rear of Panel Extensions

Table 2-124. Approximate Dimensions in Inches (mm)

A	B	C	D	E
Single Circuit Block — Full Voltage and Resistor Units	Dual Circuit, Contact Block	Transformer Light Unit	Transformer Light Unit and Single Circuit Contact Block	Transformer Light Unit and Dual Circuit Contact Block
Pushbuttons All Types and Push-Pull				
2.0 (51)	2.6 (66)	2.91 (74)	3.7 (94)	4.3 (110)
Key, Lever and Knob Selector Switches				
2.22 (57)	2.83 (72)	3.15 (80)	3.9 (99)	4.5 (115)

April 2009

E22 and EM22 Series, Ordering Examples

Ordering Example — Custom Order — Approx. 2 – 3 Weeks Delivery

Example: Three-Position Key Operated Selector Switch with Chrome Bezel, having 5 poles assembled in order as follows:

1.	X	X	O
2.	X	O	O
3.	X	X	O
4.	O	X	X
5.	X	O	O

Key to be removable from centre position only.

Base Catalogue Number	Operator Type	Operator Mode	Circuit Combinations	Key Removal Code	Complete Catalogue Number
E22Y	D	30	D C D G C	-4	= E22YD30DCDGC-4

Black levers and knobs are standard. For alternate colour, insert Code Letter as sixth digit from left – Red "R" Green "G" Yellow "Y," White "W," Blue "V" – Example: E22YCR20AABBB

Table 2-129. Selection Table

Operator Type		Operator Mode		Circuit Combinations (Select Maximum of 12)				
Code Letter	Description	Code Number	Description	Code Letter	Circuit			
Black Bezel		Two-Position Selector Switch						
E F G	Lever Operated Knob Operated Key Operated	20	2-Position Maintained		Left	Centre	Right	
			Centre to Right	A B	— —	X O	O X	
		25	Left to Right	A B	X O	— —	O X	
Chrome Bezel		Three-Position Selector Switch						
B C D	Lever Operated Knob Operated Key Operated	30	3-Position Maintained		Left	Centre	Right	
		31	Spring Return from Right and Left	C D E F	X X X O	O X O O	O O X X	
				G H	O O	X X	O O	
32	Spring Return Left to Centre		O O	X X	O O			
		Four-Position Selector Switch						
		40	4-Position Maintained		1	2	3	4
				J K L M N	X O O O X	O X O O O	O O X O O	O O X X X
				P R S T V	O O X O X	X O X O O	X O O X O	O X O X O
				W 4 5 6	X O X X	X X O X	X X X O	O X X X

E22Y	Operator Type	Operator Mode	Circuit Combinations Maximum of 12 Poles	Key Removal Code from Table 2-126 (if Required)
Base Number				

2

April 2009

E22 and EM22 Series, Suffix Codes

Suffix Codes

Table 2-131. Contact Blocks

Description	Suffix Code		Component Reference Cat. No.
	Single or Combination of Single Circuit Blocks	Dual or Combination of Dual with Single Circuit Blocks	

Standard Contact Blocks for All Operators

Except 3-Position Push-Pull and Special Function

1NO	A	—	E22B2
1NC	B	—	E22B1
1NO-1NC	C	—	E22B2 + B1
1NO-1NC	—	W	E22B11
2NO	D	—	E22B2 + B2
2NO	—	V	E22B20
2NC	E	—	E22B1 + B1
1NO-1NC overlapping	K	—	E22B3 + B4 ②
2NO-1NC ①③	F	—	E22B2 + B2 + B1
2NO-1NC ③	—	WA	E22B11 + B2
2NO-1NC ③	—	VB	E22B20 + B1
2NC-1NO ①③	G	—	E22B1 + B1 + B2
2NC-1NO ③	—	WB	E22B11 + B1
3NO ①③	H	—	E22B2 + B2 + B2
3NO ③	—	VA	E22B20 + B2
3NC ③④	J	—	E22B1 + B1 + B1
1NO-3NC ①④	—	WE	E22B11 + B1 + B1
2NO-2NC ④	—	WW	E22B11 + B11
3NO-1NC ④	—	VW	E22B20 + B11
4NO ④	—	VV	E22B20 + B20

Special Function Block Combination: For Use with 3-Position Push-Pulls

1NO-1NC Late Break	S	—	E22B1 + B4 ②
1NO-1NO	T	—	E22B1 + B5

Special Function Block Combination: For Use on Selector Switches (supplied with external jumper)

1NO-2NC	—	PP	E22B12
2NO-2NC	—	RR	E22B11 + B11

Special Function Block Combination: For Use on Trigger-Action

Emergency Stop Pushbuttons

1NC	QB	—	E22CB1
2NC	QE	—	E22CB1 + CB1
1NC-1NO	QC	—	E22CB11
2NC-1NO	QG	—	E22CB1 + CB1 + B2

- ① Can not be used with illuminated devices, push-pulls, twist-to-release operators or selector switches. Operator plug E22BA2 must be installed.
- ② E22B4 contact block not available for use with 5-way mounting adapter.
- ③ Can not be used with illuminated push-push devices. Operator plug E22BA2P must be installed with non-illuminated devices.
- ④ Can not be used on push-push devices.

Table 2-132. Light Units — Standard Size for all Operators Excluding Selector Switches and Push-Pull Units

Description	Suffix Code	Component Reference Cat. No.
Direct Voltage Light Unit AC/DC		
Without Lamp	X1	E22D ⑥
With 6V Lamp	X2	E22D6
With 12V Lamp	X3	E22D12
With 24V Lamp	X4	E22D24
With 48V Lamp	X6	E22D50
With 60V Lamp	X7	E22D60
Direct Voltage Light Unit AC/DC		
For Indicating Lights Only	X8	E22D120
With 120V Lamp		
Resistor Type Light Unit AC/DC ⑤		
120V/60 Hz	X10	E22R2
Transformer Type Light Unit AC only ⑥		
120V/60 Hz	X11	E22TL1
240V/60 Hz	X12	E22TL2
480V/60 Hz	X14	E22TL4
Neon Light Unit AC only		
120V with Lamp	X15	E22DN120
240V with Lamp	X16	E22DN240
PreTest Light Unit —		
Prewired with 1NO-1NC Contact Blocks — Transformer Type 120V/60 Hz	X27	E22TL1C ⑥
Direct Voltage without Lamp	X17	E22D0C ⑥
Direct Voltage with 24V Lamp	X20	E22D24C
Resistor Type — 120V	X26	E22R2C
LED Light Units — Direct Voltage	See Page 2-63	

- ⑤ Resistor unit is not available for use with LEDs, choose either transformer or full voltage LED style.
- ⑥ LED compatible.

Table 2-133. Light Units — For Selector Switch and Push-Pull Operators Only

Description	Suffix Code	Component Reference Cat. No.
Direct Voltage Light Unit AC/DC		
Without Tall Lamp	X1	E22DE ⑧
With 6V Tall Lamp	X2	E22DT6
With 12V Tall Lamp	X3	E22DT12
With 24V Tall Lamp	X4	E22DT24
With 48V Tall Lamp	X6	E22DT50
With 60V Tall Lamp	X7	E22DT60
Direct Voltage Light Unit AC/DC		
For Indicating Lights Only	X8	E22D120
With 120V Lamp		
Resistor Type Light Unit AC/DC ⑦		
120V Tall Bulb/60 Hz	X10	E22RT2
Transformer Type Light Unit AC only ⑧		
120V Tall Bulb/60 Hz	X11	E22TL1T
240V Tall Bulb/60 Hz	X12	E22TL2T
480V Tall Bulb/60 Hz	X14	E22TL4T
PreTest Light Unit —		
Prewired with 1NO-1NC Contact Blocks — Transformer Type 120V Tall Bulb/60 Hz	X27	E22TL1C ⑧
Direct Voltage without Tall Lamp	X17	E22DT0C ⑧
Direct Voltage with 24V Tall Lamp	X20	E22DT24C
Resistor Type — 120V Tall Lamp	X26	E22RT2C
LED Light Units — Direct Voltage	See Page 2-63	

- ⑦ Resistor unit is not available for use with LEDs, choose either transformer or full voltage LED style.
- ⑧ LED compatible.

E30 Series

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Product Description

The Cutler-Hammer® Type E30 industrial pushbutton, indicating light and selector switch line from Eaton's electrical business features a wide selection of square, multifunction operators which conveniently mount in a standard 30.5 mm [1-13/64 inches] diameter panel hole. Up to six input and indicating functions can be grouped into a single operating head, saving valuable panel space. Attractive square operator styling, coupled with custom legending of coloured buttons and lenses and many special function accessories, makes E30 components ideally suited for use on control consoles and for a variety of industrial OEM applications.

Selector Switches

E30 selector switches mount from the front of panel in a standard 30.5 mm [1-13/64"] notched hole and are fastened by means of a rear octagonal mounting nut. The units are designed to be used with Type E22 contact blocks and light modules described more fully on **Page 2-91**.

Features

Type E30 control units consist of a basic operator with one or more buttons and lenses and contact block selection dependent on the specific operator configuration.

- **Pushbutton operators** will accommodate up to four single depth stackable contact blocks behind

each operating button, up to eight circuits maximum.

- **Indicating lights** are supplied complete with either a transformer light unit up to 600V AC supply line voltage or full voltage light unit up to 120V AC/DC supply line voltage.
- **Combination pushbutton with indicating light operators** are supplied complete with a transformer or full voltage unit. Contact blocks must be ordered separately, up to four circuits maximum.
- **Selector switches** in non-illuminated, illuminated and key versions are supplied as complete assembled units including Type E22 light units and contact blocks, up to four circuits maximum.

Die Cast Construction

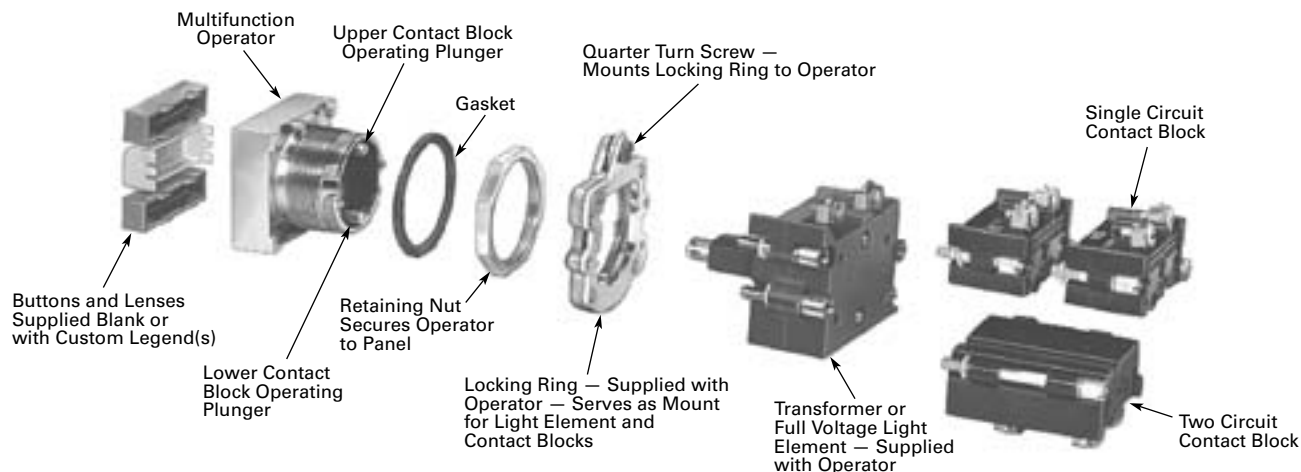
Each operator has high pressure type seals to prevent the passage of oil and other contaminants through the operator into the contact structure or panel interior. Each operator uses a Buna N cork gasket between the mounting flange on the operator and the panel to maintain oiltightness.

Standards and Certifications

- UL Listed — File No. E131568
- CSA Certified — File No. LR68551

Ingress Protection

- Single and Dual Indicating Lights
 - NEMA 1, 2, 3, 3R, 3S, 4, 4X, 12, 13
- All Other Operators
 - NEMA 3, 3R, 4, 4X, 12, 13



E30 Series

Technical Data and Specifications

Climate Conditions

- Operating: -20° to 150°F (-29° to 65°C)

Terminals

Light Units

- Terminals are saddle clamp type for 2 stranded or solid wires up to 12 AWG (4.0 mm²)
- Torque — 7 lb-in (0.8 Nm)

Contact Block

- Terminals are saddle clamp type for 2 stranded or solid wires up to 12 AWG (4.0 mm²)
- Torque — 7 lb-in (0.8 Nm)

Material

- Operator is a zinc base die casting with a copper-nickel-chrome plated finish. Withstands the 200 hr. salt spray test in accordance with MIL Spec. QQ-M-151A and NEMA 4X testing. All internal parts, including shafts, washers and springs, are made of stainless steel. The buttons and lenses are made of colourfast, wear resistant, moulded acetal resin. The contact blocks are made of moulded, heat resistant, mineral filled phenolic. The contact block plungers are moulded of nylon filled phenolic. The contacts are silver.

Drilling Dimensions — Minimum Spacing

Dimensions shown allow adequate space for the addition of one or two high legend plates and colour coordinating collars.

Note: Locating nib hole or notch is 0.136 inch (3.5 mm) drill. Alternate to drilling mounting holes use Greenlee Tool Co. punch (No. 60246) to punch the hole and (No. 720-K) to punch the notch.

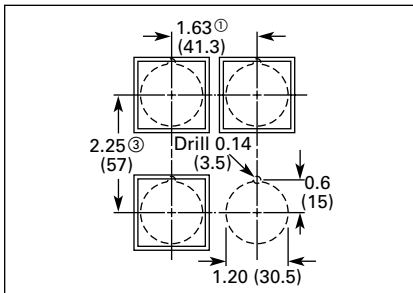


Figure 2-76. Drilling Dimensions Minimum Spacing

- ① Except 25 Watt Potentiometer — 1,000 – 25,000 Ohms, Vertical 2.38" (60 mm) Horizontal 1.88" (48 mm) — 50,000 Ohms, Vertical 3.5" (89 mm) Horizontal 2.63" (67 mm) and Test Module.

Electrical Ratings

Table 2-134. Contact Block

Meet or Exceed NEMA Contact Rating Designation A600 and P300							
Description	A600 (AC)				P300 (DC)		
	120V	240V	480V	600V	24/28V	125V	250V
Make and Emergency Interrupting Capacity (Amps)	60	30	15	12	5.73	1.1	0.55
Normal Load Break (Amps)	6	3	1.5	1.2	5.73	1.1	0.55
Continuous Amperes	10				5		

- UL A600/P300 nominal connect 10A
- 1NO, 1NC, 2NO, 2NC, 1NO-1NC, early make, late break and overlapping configurations
- Mechanical positive drive operation on NC contacts
- Palladium alloy contact for logic level or highly corrosive environments

Reliability Nibs

These nibs combine a scrubbing action with high pressure density when the contacts are closed. They push through particles and films found on contact surfaces in industrial environments. The reliability nibs self-adjust to the application — dry circuit, normal or heavy-duty.

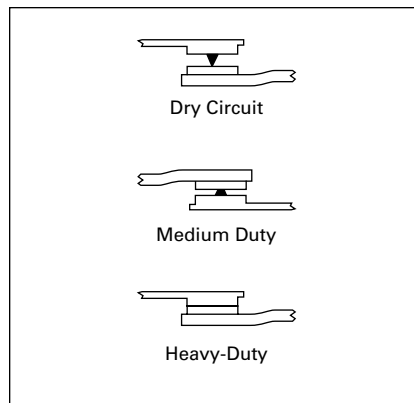


Figure 2-77. Reliability Nibs

Maximum Ratings for Logic Level and Hostile Atmosphere Applications

- Maximum amperes: 0.5A
- Maximum volts: 120V AC/DC

Light Unit

- Bulbs — average life:
 - Transformer type: 20,000 hrs.
 - Resistor/direct voltage type: 2,500 hrs. min. @ rated voltage
 - LED: 60,000 to 100,000 hrs.

Note: For additional Technical Information, see Pub. TD.74.TE.04.

Note: LEDs are available to be used in place of incandescent lamps, see Page 2-97.

Product Selection — Operators

When Ordering a Complete E30 Control Unit Specify

- Catalogue Number of Operator
- Catalogue Number of Button(s)
- Catalogue Number of Contact Block(s)
- Catalogue Number of Accessories (if required)

Ordering Example:

E30AB
 E30KB130 "START"
 E30KB231 "STOP"
 E30KLA1 1NO
 E30KLA2 1NC

Square Multifunction Operators

Table 2-135. Single Button Operator/without Button — Order Buttons Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13





	Operation	Special Features	Catalogue Number	Button Type
 <p>Single Button Operator shown with Extended Button</p>	Momentary	—	E30AA	<p>Button Type Required</p>  <p>Order from Table on Page 2-98</p>

Table 2-136. Two Button Operator/without Buttons — Order Buttons Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13



	Operation		Special Features	Catalogue Number	Button Type
	Top Button	Bottom Button			
 <p>Two Button Operator shown with Extended Buttons</p>	Momentary	Momentary	—	E30AB	<p>Button Types Required</p>  <p>Order from Table on Page 2-98</p>
	Momentary	Momentary	With Mechanical Interlock	E30AC	
	Maintained (All Contacts)	Release (All Contacts)		E30AD ^①	
	Maintained (All Contacts)	Release (All Contacts)	With Mechanical Interlock	E30AP ^{①②}	

① Limited to two single circuit, one double circuit 600V or two 120V (E30KLA9) contact blocks behind each button.

② Buttons are interlocked so that one of the two is maintained at all times.

Depressing the other button releases the maintained button and maintains the depressed button.

Table 2-137. Two Button Operator with Long (OFF) Release Bar — Includes OFF Bar/Button — Order Other Buttons Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operation		Special Features	Catalogue Number	Button Type
	Top Button	Bottom Button			
 <p>Two Button Operator shown with Long Release Bar</p>	Maintained	Maintained	—	E30AF	<p>Button Types Required^③</p>  <p>Order from Table on Page 2-98</p>
	Maintained	Maintained	With Mechanical Interlock	E30AG	
	Maintained	Momentary	With Mechanical Interlock	E30AH	
	Maintained (All Contacts)	Maintained (Bottom Contacts Only)	Top Button Operates Both Top and Bottom Contacts	E30AK ^④	





③ Operators are supplied as standard with red extended bar(s) marked "OFF" as shown in sketch. For other colours or markings, contact your nearest Eaton Distributor or call our Customer Support Centre 1-800-268-3578. For replacement of standard red release bar, order **E30KR100**.

④ Limited to two single circuit, one double circuit 600V or two 120V (E30KLA9) contact blocks behind each button.

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Square Multifunction Operators and Indicating Lights

Table 2-138. Two Button Operator with (OFF) Release — Includes OFF Bar/Button(s) — Order Other Buttons Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operation		Special Features	Catalogue Number	Button Type
	Top Button	Bottom Button			
 Two Button Operator shown with Release Bar for Top Button	Maintained	Momentary	Release Bar for Top Button	E30AL	Button Types Required ①  Order from Table on Page 2-98
 Two Button Operator shown with Individual Release Bars for Each Button	Maintained	Maintained	Individual Release Bars for Each Button	E30AN	Button Types Required ①  Order from Table on Page 2-98
	Maintained with Interlock	Maintained with Interlock	Individual Release Bars for Each Button	E30AM	

① Operators are supplied as standard with red extended release bar(s) marked "OFF" as shown in sketch. For other colours or markings, contact your nearest Eaton Distributor or call our Customer Support Centre 1-800-268-3578. For replacement of standard red release bar, order E30KR101.



Table 2-139. Single Indicating Light Unit/without Lens — Order Lenses Separately — UL (NEMA) 3, 3R, 3S, 4, 4X, 12, 13

	Type of Light Element						Lens Type
	Transformer (60/50 Hertz AC)			Full Voltage (60/50 Hertz AC or DC)			
	Voltage	Lamp Number ③	Catalogue Number	Voltage	Lamp Number ③	Catalogue Number	
 Single Indicating Light Unit shown with Lens	120	6PSB	E30BA	24 120	24PSB 120PSB	E30BJ E30BM	Lens Type Required  Order from Table on Page 2-99

② 28 Volt Lamp with series resistor.

③ Light units will also accept LED lamps. For LED Part Numbers, see Table 2-145 on Page 2-97.

Table 2-140. Dual Indicating Light Unit/without Lenses — Order Lenses Separately — UL (NEMA) 3, 3R, 3S, 4, 4X, 12, 13

	Type of Light Element						Lens Type
	Transformer (60/50 Hertz AC)			Full Voltage (60/50 Hertz AC or DC)			
	Voltage	Lamp Number ⑤	Catalogue Number	Voltage	Lamp Number ⑤	Catalogue Number	
 Dual Indicating Light Unit shown with Lens	120	6PSB	E30CA	24 120	24PSB 120PSB	E30CJ E30CM	Lens Type Required  Order from Table on Page 2-100

④ 28 Volt Lamp with series resistor.



⑤ Light units will also accept LED lamps. For LED Part Numbers, see Table 2-145 on Page 2-97.

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Square Multifunction Operators and Indicating Lights (Continued)

Table 2-141. Single Button Operator with Indicating Light/without Button or Lens — Order Button and Lenses Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operation (Bottom Button)	Type of Light Element						Button/Lens Type
		Transformer (60/50 Hertz AC)			Full Voltage (60/50 Hertz AC or DC)			
		Voltage	Lamp Number ①	Catalogue Number	Voltage	Lamp Number ①	Catalogue Number	
 <i>Single Button Operator and Indicating Light shown with Button & Lens</i>	Momentary	120	6PSB	E30DA	24 120	24PSB 120PSB	E30DX3 E30DF	<i>Button and Lens Types Required</i>  Order from Tables on Pages 2-98 and 2-100

① Light units will also accept LED lamps. For LED Part Numbers, see Table 2-145 on Page 2-97.



Table 2-142. Single Button Operator with (OFF) Release Bar and Indicating Light — Includes OFF Bar/Button — Order Other Button and Lens Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operation (Bottom Button)	Type of Light Element						Button/Lens Type
		Transformer (60/50 Hertz AC)			Full Voltage (60/50 Hertz AC or DC)			
		Voltage	Lamp Number ②	Catalogue Number	Voltage	Lamp Number ②	Catalogue Number	
 <i>Single Button Operator with Release Bar and Indicating Light shown with Button & Lens</i>	Maintained	120	6PSB	E30DG	24 120	24PSB 120PSB	E30DX13 E30DM	<i>Button and Lens Types Required</i> ③  Order from Tables on Pages 2-98 and 2-100

② These operators are supplied as standard with red extended release bar(s) marked "OFF" as shown in sketch. For other colours or markings, contact your nearest Eaton Distributor or call our Customer Support Centre 1-800-268-3578. For replacement of standard red release bar, order E30KR101.

③ Light units will also accept LED lamps. For LED Part Numbers, see Table 2-145 on Page 2-97.

Table 2-143. Two Button Operator with Indicating Light/without Buttons or Lens — Order Buttons and Lenses Separately — UL (NEMA) 3, 3R, 4, 4X, 12, 13



	Button Operation	Type of Light Element						Button/Lens Type
		Transformer (60/50 Hertz AC)			Full Voltage (60/50 Hertz AC or DC)			
		Voltage	Lamp Number ④	Catalogue Number	Voltage	Lamp Number ④	Catalogue Number	
 <i>Two Button Operator with Indicating Light shown with Button & Lens</i>	Momentary	120	6PSB	E30EA	24 120	24PSB 120PSB	E30EX3 E30EF	<i>Button and Lens Types Required</i>  Order from Tables on Pages 2-99 – 2-100
	Momentary with Interlock	120	6PSB	E30EG	24 120	24PSB 120PSB	E30EX13 E30EM	

④ Light units will also accept LED lamps. For LED Part Numbers, see Table 2-145 on Page 2-97.

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Square Multifunction Operators and Indicating Lights (Continued)

Table 2-144. Two Button Operator with Dual Indicating Lights/without Buttons and Lenses — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Button Operation	Type of Light Element						Button/Lens Type
		Transformer (60/50 Hertz AC)			Full Voltage (60/50 Hertz AC or DC)			
		Voltage	Lamp No. ①	Catalogue Number	Voltage	Lamp No. ①	Catalogue Number	
 Two Button Operator with Dual Indicating Lights shown with Button & Lens	Momentary	120	6PSB	E30JA	24 120	24PSB 120PSB	E30JX3 E30JF	Button and Lens Types Required  Order from Tables on Pages 2-99 – 2-100

① Light units will also accept LED lamps. For LED Part Numbers, see Table 2-145.

Table 2-145. Replacement Lamps — Incandescent and LED

Lamp Voltage	Incandescent Lamps			LED Lamps			
	Manufacturers Part Number	Base Style	Eaton's Cutler-Hammer Part Number	Eaton's Cutler-Hammer Part Number			
				Red	Green	Yellow	Blue ②
6	6PSB	T2 Slide	28-1022	35-1523	35-1523-2	35-1523-3	35-1523-17
12	12PSB	T2 Slide	28-1025	35-1523-11	35-1523-12	35-1523-13	35-1523-18
24	24PSB	T2 Slide	28-1026	35-1523-4	35-1523-5	35-1523-6	35-1523-19
28	28PSB	T2 Slide	28-1027	35-1523-4	35-1523-5	35-1523-6	35-1523-19
48	48PSB	T2 Slide	28-1028	35-1523-14	35-1523-15	35-1523-16	35-1523-20
120	120PSB	T2 Slide	28-1029	35-1523-7	35-1523-8	35-1523-9	35-1523-21

② E30 blue LED bulbs may not provide sufficient intensity for some applications.

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Product Selection — Operator Components

Operating Buttons Only

Table 2-146. Type A Buttons with Standard Markings



	Colour	Marking	Extended Button	Short Button	Colour	Marking	Extended Button	Short Button	Button Application
			Catalogue Number	Catalogue Number			Catalogue Number	Catalogue Number	
 <p>Type A Extended Button for Use with Operator E30AA, Legend Characters 3/16 Inch (4.8 mm) High</p>	Black	Blank	E30KA100	E30KA150	Green	START	E30KA330	E30KA380	
	Black	START	—	E30KA180	Yellow	Blank	E30KA400	E30KA450	
	Red	Blank	E30KA200	E30KA250	White	Blank	E30KA500	E30KA550	
	Red	EMERG. STOP	E30KA204	—	Grey	Blank	E30KA600	E30KA650	
	Red	OFF	E30KA218	E30KA268	Brown	Blank	E30KA700	E30KA750	
	Red	STOP	E30KA231	E30KA281	Orange	Blank	E30KA800	E30KA850	
	Green	Blank	E30KA300	E30KA350	Blue	Blank	E30KA900	E30KA950	

Table 2-147. Type B Buttons with Standard Markings





	Colour	Marking	Extended Button	Short Button	Colour	Marking	Extended Button	Short Button	Button Application
			Catalogue Number	Catalogue Number			Catalogue Number	Catalogue Number	
 <p>Type B Extended Button for Use with Operators E30AB thru AE, AL and DA thru DF, Legend Characters 3/16 Inch (4.8 mm) High</p>	Black	Blank	E30KB100	E30KB150	Black	REVERSE	E30KB125	E30KB175	
	Black	AUTO	E30KB101	E30KB151	Black	RUN	E30KB126	E30KB176	
	Black	CLOSE	E30KB102	E30KB152	Black	SLOW	E30KB128	E30KB178	
	Black	DOWN	E30KB103	E30KB153	Black	START	E30KB130	E30KB180	
	Black	FAST	E30KB105	E30KB155	Black	TEST	E30KB132	E30KB182	
	Black	FORWARD	E30KB107	E30KB157	Black	UP	E30KB134	E30KB184	
	Black	HIGH	E30KB109	E30KB159	Red	Blank	E30KB200	E30KB250	
	Black	IN	E30KB110	E30KB160	Red	EMER. STOP	E30KB204	—	
	Black	INCH	E30KB111	E30KB161	Red	OFF	E30KB218	E30KB268	
	Black	JOG	E30KB112	E30KB162	Red	STOP	E30KB231	E30KB281	
	Black	JOG FOR.	E30KB113	E30KB163	Green	Blank	E30KB300	E30KB350	
	Black	JOG REV.	E30KB114	E30KB164	Green	START	E30KB330	E30KB380	
	Black	LOW	E30KB115	E30KB165	Yellow	Blank	E30KB400	E30KB450	
	Black	LOWER	E30KB116	E30KB166	White	Blank	E30KB500	E30KB550	
	Black	MAN	E30KB117	E30KB167	White	AUTO	E30KB501	—	
Black	ON	E30KB119	E30KB169	White	HAND	E30KB508	—		
Black	OPEN	E30KB120	E30KB170	Grey	Blank	E30KB600	E30KB650		
Black	OUT	E30KB121	E30KB171	Brown	Blank	E30KB700	E30KB750		
Black	RAISE	E30KB122	E30KB172	Orange	Blank	E30KB800	E30KB850		
Black	RESET	E30KB124	E30KB174	Blue	Blank	E30KB900	E30KB950		

Table 2-148. Type C Buttons with Standard Markings

	Colour	Marking	Extended Button	Short Button	Colour	Marking	Extended Button	Short Button	Button Application
			Catalogue Number	Catalogue Number			Catalogue Number	Catalogue Number	
 <p>Type C Extended Button for Use with Operators E30AF thru AK, AL thru AM and DG thru DM, Legend Characters 1/8 Inch (3.2 mm) High</p>	Black	Blank	E30KC100	E30KC150	Black	RESET	E30KC124	E30KC174	
	Black	AUTO	E30KC101	E30KC151	Black	REVERSE	E30KC125	E30KC175	
	Black	CLOSE	E30KC102	E30KC152	Black	RUN	E30KC126	E30KC176	
	Black	DOWN	E30KC103	E30KC153	Black	SLOW	E30KC128	E30KC178	
	Black	FAST	E30KC105	E30KC155	Black	START	E30KC130	E30KC180	
	Black	FORWARD	E30KC107	E30KC157	Black	TEST	E30KC132	E30KC182	
	Black	HAND	E30KC108	E30KC158	Black	UP	E30KC134	E30KC184	
	Black	HIGH	E30KC109	E30KC159	Red	Blank	E30KC200	E30KC250	
	Black	IN	E30KC110	E30KC160	Red	OFF	E30KC218	—	
	Black	INCH	E30KC111	E30KC161	Red	STOP	E30KC231	E30KC281	
	Black	JOG	E30KC112	E30KC162	Green	Blank	E30KC300	E30KC350	
	Black	JOG FOR.	E30KC113	E30KC163	Green	START	E30KC330	E30KC380	
	Black	JOG REV.	E30KC114	E30KC164	Yellow	Blank	E30KC400	E30KC450	
	Black	LOW	E30KC115	E30KC165	White	Blank	E30KC500	E30KC550	
	Black	LOWER	E30KC116	E30KC166	Grey	Blank	E30KC600	E30KC650	
Black	MAN	E30KC117	E30KC167	Brown	Blank	E30KC700	E30KC750		
Black	ON	E30KC119	E30KC169	Orange	Blank	E30KC800	E30KC850		
Black	OPEN	E30KC120	E30KC170	Blue	Blank	E30KC900	E30KC950		
Black	OUT	E30KC121	E30KC171						
Black	RAISE	E30KC122	E30KC172						

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Operating Buttons and Lens Only

Standard Colour Buttons and Lens Marking

BLACK LETTERING on — White, Amber, Yellow and Clear.

WHITE LETTERING on — Green, Red, Blue, Brown, Black, Orange and Grey.

For lenses with special markings or with standard markings but in a different colour, refer to instructions on **Pages 2-105 – 2-107**.

Table 2-149. Type E Buttons with Standard Markings





	Colour	Marking	Extended Button	Colour	Marking	Extended Button	Button Application
			Catalogue Number			Catalogue Number	
 <p><i>Type E Button for Use with Operators E30EA thru EM, FA thru FM and JA thru JM, Legend Characters 1/8 inch (3.2 mm) High</i></p>	Black	Blank	E30KE100	Black	RESET	E30KE124	
	Black	CLOSE	E30KE102	Black	REVERSE	E30KE125	
	Black	DOWN	E30KE103	Black	RUN	E30KE126	
	Black	FAST	E30KE105	Black	SLOW	E30KE128	
	Black	FORWARD	E30KE107	Black	START	E30KE130	
	Black	HIGH	E30KE109	Black	TEST	E30KE132	
	Black	IN	E30KE110	Black	UP	E30KE134	
	Black	INCH	E30KE111	Red	Blank	E30KE200	
	Black	JOG	E30KE112	Red	OFF	E30KE218	
	Black	JOG FOR.	E30KE113	Red	STOP	E30KE231	
	Black	JOG REV.	E30KE114	Green	Blank	E30KE300	
	Black	LOW	E30KE115	Green	START	E30KE330	
	Black	LOWER	E30KE116	Yellow	Blank	E30KE400	
	Black	ON	E30KE119	White	Blank	E30KE500	
	Black	OPEN	E30KE120	Grey	Blank	E30KE600	
	Black	OUT	E30KE121	Brown	Blank	E30KE700	
Black	PHASE	E30KE122	Orange	Blank	E30KE800		
			Blue	Blank	E30KE900		

Table 2-150. Type F Lenses with Standard Markings

	Colour	Marking	Catalogue Number	Colour	Marking	Catalogue Number	Lens Application
 <p><i>Type F Lens for Use with Operators E30BA thru BY, Legend Characters 3/16 inch (4.8 mm) High</i></p>	Red	Blank	E30KF10	Green	OFF	E30KF22	
	Red	MOTOR RUN	E30KF11	Amber	Blank	E30KF30	
	Red	ON	E30KF12	Blue	Blank	E30KF40	
	Red	POWER ON	E30KF13	Clear	Blank	E30KF50	
	Green	Blank	E30KF20	White	Blank	E30KF60	
	Green	MOTOR STOP	E30KF21				
	Green	MOTOR RUN	E30KF23				

2

Operator Lens Only

Standard Colour Buttons and Lens Marking

BLACK LETTERING on — White, Amber, Yellow and Clear.

WHITE LETTERING on — Green, Red, Blue, Brown, Black, Orange and Grey.

For lenses with special markings or with standard markings but in a different colour, refer to instructions on **Pages 2-105 – 2-107**.

Table 2-151. Type G Lenses with Standard Markings



	Colour	Marking	Catalogue Number	Colour	Marking	Catalogue Number	Lens Application
 <p><i>Type G Lens for Use with Operators E30CA thru CM and DA thru DM, Legend Characters 3/16 inch (4.8 mm) High Except MOTOR RUN, POWER ON & MOTOR STOP are 1/8 inch (3.2 mm) High</i></p>	Red	Blank	E30KG10	Green	OFF	E30KG22	
	Red	MOTOR RUN	E30KG11	Green	READY	E30KG23	
	Red	ON	E30KG12	Amber	Blank	E30KG30	
	Red	POWER ON	E30KG13	Blue	Blank	E30KG40	
	Green	Blank	E30KG20	Clear	Blank	E30KG50	
	Green	MOTOR RUN	E30KG24	White	Blank	E30KG60	
	Green	MOTOR STOP	E30KG21				

Table 2-152. Type J Lenses with Standard Markings



	Colour	Marking	Catalogue Number	Colour	Marking	Catalogue Number	Lens Application
 <p><i>Type J Lens for Use with Operators E30EA thru EM, FA thru FM and GA thru GM, Legend Characters 1/8 (3.2 mm) High</i></p>	Red	Blank	E30KJ10	Green	OFF	E30KJ22	
	Red	MOTOR RUN	E30KJ11	Green	ON	E30KJ24	
	Red	ON	E30KJ12	Amber	Blank	E30KJ30	
	Red	POWER ON	E30KJ13	Blue	Blank	E30KJ40	
	Red	MOTOR STOP	E30KJ14	Clear	Blank	E30KJ50	
	Green	Blank	E30KJ20	White	Blank	E30KJ60	
	Green	MOTOR STOP	E30KJ21				
	Green	MOTOR RUN	E30KJ23				

Table 2-153. Type K Lenses with Standard Markings — Sold in pairs only




	Colour		Marking		Catalogue Number	Lens Application			
	Left Hand Lens	Right Hand Lens	Left Hand Lens	Right Hand Lens					
 <p><i>Type K Lenses for Use with Operators E30JA thru JW, Legend Characters 1/8 inch (3.2 mm) High</i></p>	Red	Red	ON	ON	E30KK12				
	Red	Green	ON	OFF			E30KK13		
	Green	Green	OFF	OFF				E30KK22	
	Green	Red	OFF	ON					E30KK23

Table 2-154. Type K Lenses — Blank — Sold in pairs only

	Colour		Catalogue Number	Colour		Catalogue Number
	Left Hand Lens	Right Hand Lens		Left Hand Lens	Right Hand Lens	
	Red	Red	E30KK10	Blue	Red	E30KK41
	Red	Green	E30KK11	Blue	Green	E30KK42
	Red	Amber	E30KK17	Blue	Amber	E30KK43
	Red	Blue	E30KK14	Blue	Blue	E30KK40
	Red	Clear	E30KK15	Blue	Clear	E30KK45
	Red	White	E30KK16	Blue	White	E30KK46
	Green	Red	E30KK21	Clear	Red	E30KK51
	Green	Green	E30KK20	Clear	Green	E30KK52
	Green	Amber	E30KK27	Clear	Amber	E30KK53
	Green	Blue	E30KK24	Clear	Blue	E30KK54
	Green	Clear	E30KK25	Clear	Clear	E30KK50
	Green	White	E30KK26	Clear	White	E30KK56
	Amber	Red	E30KK31	White	Red	E30KK61
	Amber	Green	E30KK32	White	Green	E30KK62
	Amber	Amber	E30KK30	White	Amber	E30KK63
	Amber	Blue	E30KK34	White	Blue	E30KK64
	Amber	Clear	E30KK35	White	Clear	E30KK65
	Amber	White	E30KK36	White	White	E30KK60

April 2009

E30 Series, Components — Contact Blocks

Contact Blocks

Standard Contact Blocks — Moulded, phenolic construction. Enclosed silver contacts with reliability “nibs” that improve the reliability of switching performance under dry circuit, corrosive atmosphere and fine dust conditions. For more extreme conditions, the Logic Level contact blocks described below are recommended.

Table 2-155. Standard Contact Block Ratings — Maximum Amperes

Current	AC Volts A600				DC Volts P300		
	120	240	480	600	24/28	125	250
Make & Emergency Inter. Capacity	60	30	15	12	5.73	1.1	0.55
Normal Load Break	6	3	1.5	1.2	5.73	1.1	0.55
Continuous Current	10						















Logic Level Contact Blocks — Feature palladium contacts. Palladium, which is more inert than gold, is well suited for voltages and currents approaching zero. When mounted in an enclosure rated for highly corrosive environments, logic level contact blocks can be used where exposure to chemicals may cause failure to other types of materials.

Table 2-156. Maximum Ratings for Logic Level and Hostile Atmosphere Application ①

Maximum Amperes	0.5A ①
Maximum Volts	120V AC/DC

① Logic level contact blocks are UL A600/P500 rated per table above.

Table 2-158. Contact Block Selection Table

Contact Block Type ⑥	Circuit	Pressure Terminals		Quick Connect Terminals ⑤
		STANDARD Catalogue Number	LOGIC LEVEL Catalogue Number	STANDARD Catalogue Number
	 1NO	600 Volt AC, 250 Volt DC — Single Circuit		
	 1NC	E30KLA1	E30KLAE1	E30KLB1
 <i>Screw Terminals</i>	 1NO-1NC	600 Volt AC, 250 Volt DC — Two Circuit		
	 2NO	E30KLA3	E30KLAE3	E30KLB3
	 2NC	E30KLA4	E30KLAE4	E30KLB4
	Special Contact Operation	E30KLA5	E30KLAE5	E30KLB5
	 1NO-1NC Overlapping	E30KLA6 ③	—	E30KLB6 ③
	 2NO (One Early Closing)	E30KLA7 ③	—	E30KLB7 ③
 <i>Quick Connect Terminals</i>	 2NC (One Late Opening)	E30KLA8	—	E30KLB8
	 1NO-1NC	120 Volt AC Only — Two Circuit		
	 1NO-1NC	E30KLA9 ④	—	E30KLB9 ④

③ Do not use with maintained operators.

④ Contacts must be same polarity.

⑤ Supplied with non-stacking screws. Limited to 2 contact blocks mounted in positions 1 and 5.

⑥ Individually boxed contact blocks master packed 10 per carton.

Mounting Limitations

Figure 2-78 and Table 2-157 give the contact block mounting limitations for Type E30 pushbutton and combination pushbutton and light operators. Mounting positions 1 thru 8 indicate single depth contact blocks. Each of these positions can represent either a single circuit 600 volt block or a 2-circuit 120 volt block. The 2-circuit 600 volt block requires two of the numbered positions shown.

Table 2-157. Mounting Positions

Catalogue Number of Operator	Contact Blocks Can Be Mounted in Positions Listed Below	
	Upper Stack	Lower Stack
E30AA thru E30AM ②	1-2-3-4	5-6-7-8
E30BA thru E30CM	None	None
E30DA thru E30DM	None	5-6-7-8
E30EA thru E30GM	2-3-4	6-7-8
E30JA thru E30JM	3-4	7-8

② Except Operator E30AD, AJ or AK which will accommodate contact blocks 1, 2, 5 and 6 only. (See figure below.)

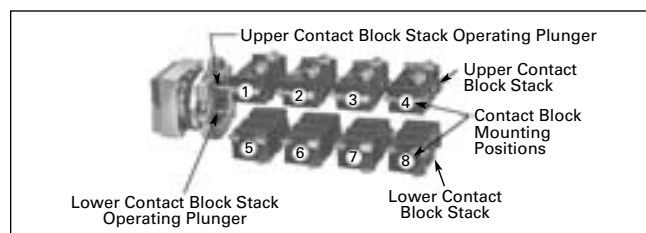


Figure 2-78. Mounting Positions



E30 Selector Switch

Product Selection
Complete Devices

E30 Selector Switches

A complete selector switch unit consists of an operator with knob/key, a faceplate, a light module for illuminated

versions and contact block(s). The units listed below are assembled and shipped complete, less the faceplate. Faceplates must be ordered separately from listing on **Page 2-108**.

Table 2-159. Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact Sequence O = Circuit Open X = Circuit Closed			Cam	Operating Mode M = Maintained S = Momentary			Non-illuminated		Illuminated ^①	Contact Block Mounting Position Viewed from Rear of Panel		
Left	Centre	Right		Left	Centre	Right	Knob Operator Black	Key Operator	Knob Operator Red	1 Left	3	2 Right
⊗	⊗	⊗	Cam 1 has 1 Peak, Cam 2 has 2 Peaks	⊗	⊗	⊗	Knob Operator Black	Key Operator	Knob Operator Red	1 Left	3	2 Right
Viewed from Front of Panel				Viewed from Front of Panel			Catalogue Number	Catalogue Number	Catalogue Number			

Two-Position — 45° Throw

	O	X	2		M	M	S	E30XF1A E30XE1A	E30TF5A E30TE4A	E30SF2_A E30SE2_A	1NO	—	—
	X	O	2		M	M	S	E30XF1B E30XE1B	E30TF5B E30TE4B	E30SF2_B E30SE2_B	1NC	—	—
	X	O	2		M	M	S	E30XF1C E30XE1C	E30TF5C E30TE4C	E30SF2_C E30SE2_C	1NC	—	1NO
	X	O	2		M	M	S	E30XF1E E30XE1E	E30TF5E E30TE4E	E30SF2_E E30SE2_E	1NC	—	1NC
	O	X	2		M	M	S	E30XF1D E30XE1D	E30TF5D E30TE4D	E30SF2_D E30SE2_D	1NO	—	1NO
	O	X	2		M	M	S	E30XF1VA E30XE1VA	E30TF5VA E30TE4VA	E30SF2_VA E30SE2_VA	2NO	—	1NO
	O	X	2		M	M	S	E30XF1WW E30XE1WW	E30TF5WW E30TE4WW	E30SF2_WW E30SE2_WW	1NO-1NC	—	1NO-1NC
	O	X	2		M	M	S	E30XF1VV E30XE1VV	E30TF5VV E30TE4VV	E30SF2_VV E30SE2_VV	2NO	—	2NO

Three-Position — 45° Throw Between Lever Positions

O	X	X	1	M	M	M	S	E30XG1C E30XJ1C E30XL1C E30XN1C	E30TG7C E30TJ5C E30TL4C E30TN6C	E30SG2_C E30SJ2_C E30SL2_C E30SN2_C	1NC	—	1NO
X	O	O	1	M	M	M	S	E30XG1D E30XJ1D E30XL1D E30XN1D	E30TG7D E30TJ5D E30TL4D E30TN6D	E30SG2_D E30SJ2_D E30SL2_D E30SN2_D	1NO	—	1NO
O	X	X	1	M	M	M	S	E30XG1E E30XJ1E E30XL1E E30XN1E	E30TG7E E30TJ5E E30TL4E E30TN6E	E30SG2_E E30SJ2_E E30SL2_E E30SN2_E	1NC	—	1NC
X	O	O	1	M	M	M	S	E30XG1F E30XJ1F E30XL1F E30XN1F	E30TG7F E30TJ5F E30TL4F E30TN6F	E30SG2_F E30SJ2_F E30SL2_F E30SN2_F	1NO	—	1NC

① Insert Code Number for Light Unit from table on **Page 2-108** and make necessary price addition. Example: E30SF2 X11 A.

Selector Switch Options **Page 2-108**
Contact Block Ratings **Page 2-91**
Dimensions **Page 2-113**

E30 Selector Switches (Continued)

Table 2-159. Selector Switches — UL (NEMA) 3, 3R, 4, 4X, 12, 13 (Continued)

Contact Sequence O = Circuit Open X = Circuit Closed			Cam	Operating Mode M = Maintained S = Momentary			Non-illuminated		Illuminated ①	Contact Block Mounting Position Viewed from Rear of Panel		
Left	Centre	Right		Left	Centre	Right	Knob Operator Black	Key Operator	Knob Operator Red	1 Left	3	2 Right
			Cam 1 has 1 Peak, Cam 2 has 2 Peaks				Knob Operator Black					
Viewed from Front of Panel				Viewed from Front of Panel			Catalogue Number	Catalogue Number	Catalogue Number			

Three Position — 45° Throw Between Lever Positions

X O	O X	O X	1	M S M	M M M	M S S	E30XG1W E30XJ1W E30XL1W E30XC1W	E30TG7W E30TJ5W E30TL4W E30TN6W	E30SG2_W E30SJ2_W E30SL2_W E30SN2_W	1NO-1NC	—	—
O O	X O	O X	2	M S M	M M M	M S S	E30XH1C E30XK1C E30XM1C E30XP1C	E30TH7C E30TK5C E30TM4C E30TP6C	E30SH2_C E30SK2_C E30SM2_C E30SP2_C	1NC	—	1NO
X O	O O	X X	2	M S M	M M M	M S S	E30XH1D E30XK1D E30XM1D E30XP1D	E30TH7D E30TK5D E30TM4D E30TP6D	E30SH2_D E30SK2_D E30SM2_D E30SP2_D	1NO	—	1NO
O X	X X	O O	2	M S M	M M M	M S S	E30XH1E E30XK1E E30XM1E E30XP1E	E30TH7E E30TK5E E30TM4E E30TP6E	E30SH2_E E30SK2_E E30SM2_E E30SP2_E	1NC	—	1NC
X X	O X	X O	2	M S M	M M M	M S S	E30XH1F E30XK1F E30XM1F E30XP1F	E30TH7F E30TK5F E30TM4F E30TP6F	E30SH2_F E30SK2_F E30SM2_F E30SP2_F	1NO	—	1NC
X O O	O X O	O O X	1	M S M	M M M	M S S	E30XG1RR E30XJ1RR E30XL1RR E30XN1RR	E30TG7RR E30TJ5RR E30TL4RR E30TN6RR	E30SG2_RR E30SJ2_RR E30SL2_RR E30SN2_RR	1NO-1NC	1NO-1NC Prewired (E22N22)	
X O O	O X O	O X X	1	M S M	M M M	M S S	E30XG1WA E30XJ1WA E30XL1WA E30XN1WA	E30TG7WA E30TJ5WA E30TL4WA E30TN6WA	E30SG2_WA E30SJ2_WA E30SL2_WA E30SN2_WA	1NO-1NC	—	1NO
X O X	O X X	O X O	1	M S M	M M M	M S S	E30XG1WB E30XJ1WB E30XL1WB E30XN1WB	E30TG7WB E30TJ5WB E30TL4WB E30TN6WB	E30SG2_WB E30SJ2_WB E30SL2_WB E30SN2_WB	1NO-1NC	—	1NC
X O O X	O X O O	O X X O	1	M S M	M M M	M S S	E30XG1WW E30XJ1WW E30XL1WW E30XN1WW	E30TG7WW E30TJ5WW E30TL4WW E30TN6WW	E30SG2_WW E30SJ2_WW E30SL2_WW E30SN2_WW	1NO-1NC	—	1NO-1NC
X X O O	O O X O	O O X X	1	M S M	M M M	M S S	E30XG1VV E30XJ1VV E30XL1VV E30XN1VV	E30TG7VV E30TJ5VV E30TL4VV E30TN6VV	E30SG2_VV E30SJ2_VV E30SL2_VV E30SN2_VV	2NO	—	2NO
X O O O	O X X O	O X X X	1	M S M	M M M	M S S	E30XG1VW E30XJ1VW E30XL1VW E30XN1VW	E30TG7VW E30TJ5VW E30TL4VW E30TN6VW	E30SG2_VW E30SJ2_VW E30SL2_VW E30SN2_VW	1NO-1NC	—	2NO
X X O O	O O X O	X X X X	2	M S M	M M M	M S S	E30XH1VV E30XK1VV E30XM1VV E30XP1VV	E30TH7VV E30TK5VV E30TM4VV E30TP6VV	E30SH2_VV E30SK2_VV E30SM2_VV E30SP2_VV	2NO	—	2NO
X X O X	O O X O	X X X O	2	M S M	M M M	M S S	E30XH1VW E30XK1VW E30XM1VW E30XP1VW	E30TH7VW E30TK5VW E30TM4VW E30TP6VW	E30SH2_VW E30SK2_VW E30SM2_VW E30SP2_VW	2NO	—	1NO-1NC


① Insert Code Number for Light Unit from table on Page 2-108 and make necessary price addition. Example: E30SG2 X10 W.

Selector Switch Options Page 2-108
Contact Block Ratings Page 2-91
Dimensions..... Page 2-113

E30 Series, Complete Devices — Potentiometers

Potentiometers

Table 2-160. Potentiometers — UL (NEMA) 13 Only

	Resistance (Ohms)	Description
		2 Watt Potentiometer Rated at 50V AC/DC
		Catalogue Number
 <p><i>Potentiometer</i></p>	1,000	E30KP11
	2,500	E30KP12
	5,000	E30KP16
	10,000	E30KP13
	25,000	E30KP14
	50,000	E30KP15
	Operator Only	E30KP10

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E30 Series, Options — Legend Plates

Options

Markings and Legend Plates

Buttons or Lenses with Non-standard Horizontal Markings

Markings not listed as STANDARD MARKINGS below are considered non-standard. If more than one marking is required on a button or lens, order non-standard markings.

Ordering Instructions

- Specify Catalogue Number of blank button or lens of desired colour, plus Suffix "STAMP" for Non-standard or "STD" for Standard markings in Order

Notes. See Pages 2-98 – 2-100.

- Specify size, legend desired and location in Order Notes by alphas as shown in example.
- Do not exceed maximum number of legend characters per line.

Ordering Example:

Green Type B button to be marked with non-standard legend "ALL ELEVATORS DOWN."

Catalogue No.: E30KB300STAMP
Letter Size: 1/8"
Pos. A – ALL
Pos. C – ELEVATORS
Pos. F – DOWN

Table 2-161. Button Markings

Description
All Types except K Type K

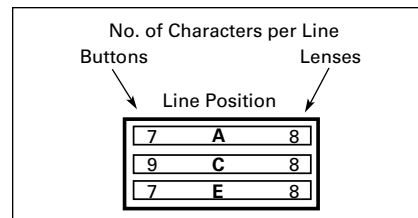


Figure 2-79. How to Use the Legend

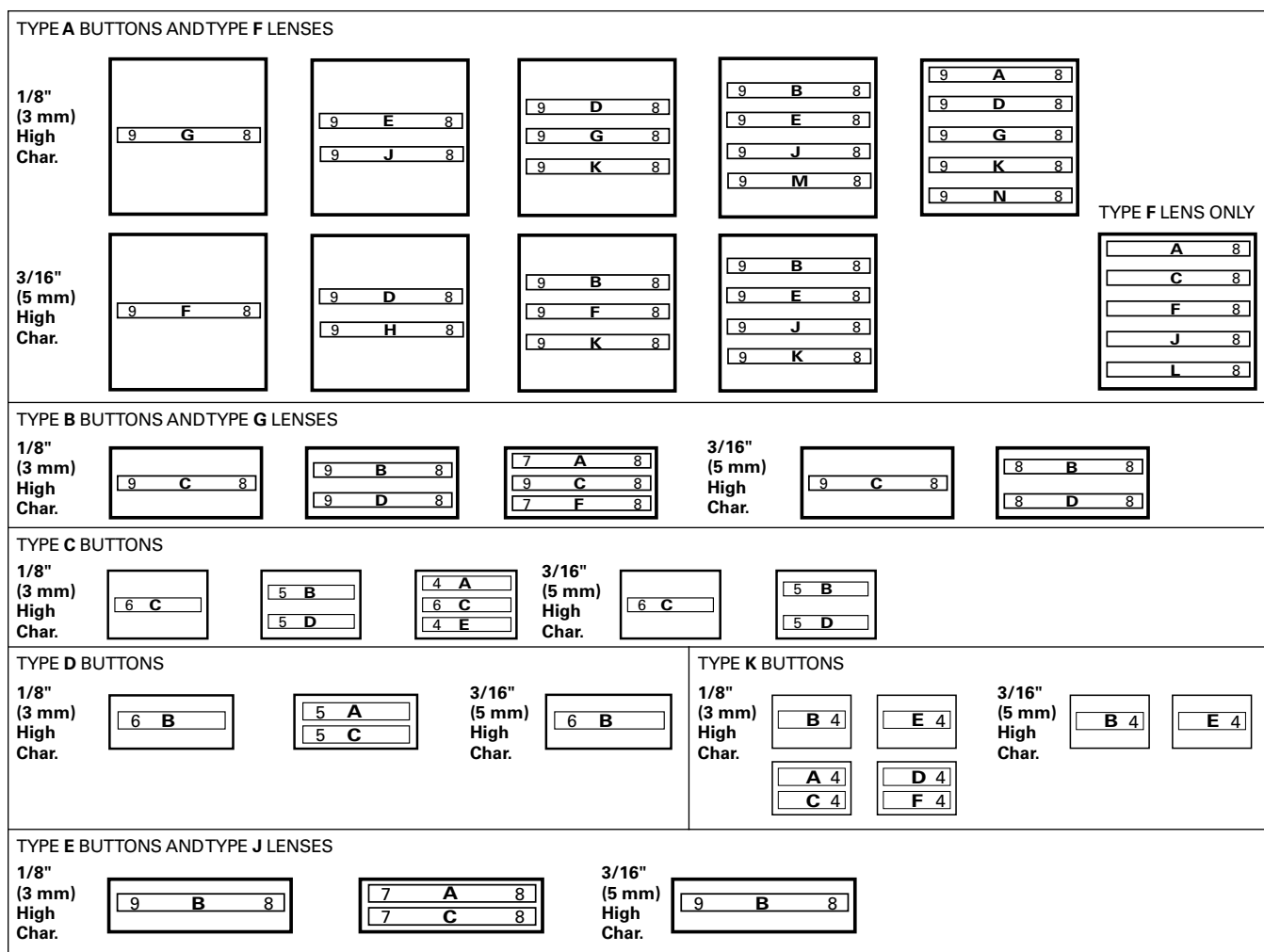


Figure 2-80. Legend Locations

Table 2-162. Standard Markings

AUTO	EMERG. STOP	HAND	INCH	JOG REV.	MAN.	OPEN	RESET	SLOW	TEST	MOTOR STOP
CLOSE	FAST	HIGH	JOG	LOW	OFF	OUT	REVERSE	START	UP	POWER ON
DOWN	FORWARD	IN	JOG FOR.	LOWER	ON	RAISE	RUN	STOP	MOTOR RUN	READY

E30 Series, Options — Legend Plates

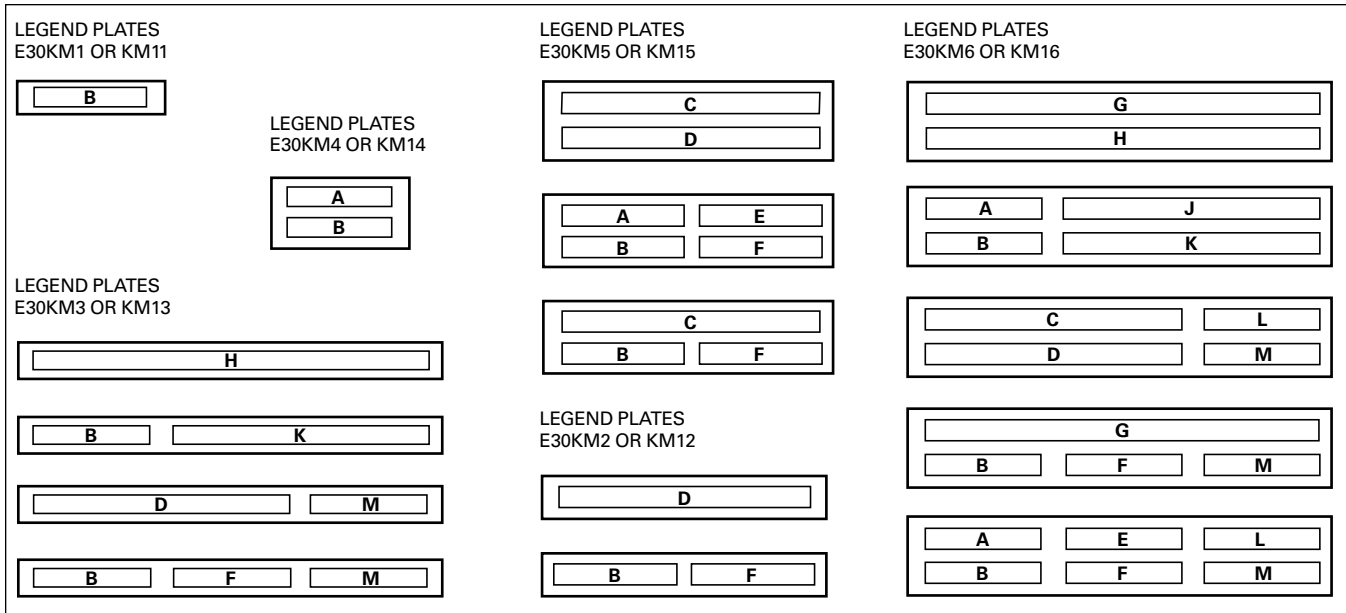


Figure 2-81. Legend Arrangements and Legend Locations

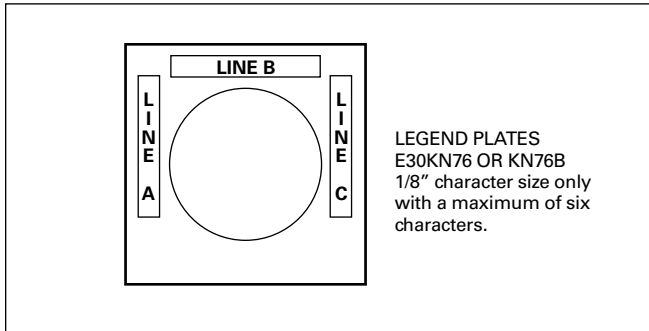


Figure 2-82. Legend Plates E30KN76 or KN76B

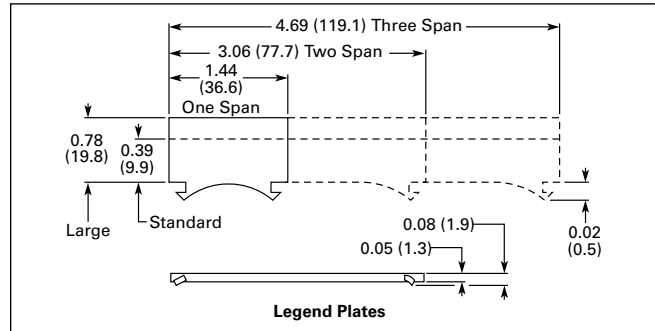


Figure 2-83. Approximate Dimensions in Inches (mm)

Table 2-163. Maximum Number and Size of Permissible Legend Characters of Custom Stamped Legend Plates

Type	No. of Lines	Size and Maximum Number of Characters Per Line								
		One Span			Two Span			Three Span		
		3/32" (2.5 mm)	1/8" (3 mm)	3/16" (5 mm)	3/32" (2.5 mm)	1/8" (3 mm)	3/16" (5 mm)	3/32" (2.5 mm)	1/8" (3 mm)	3/16" (5 mm)
Standard	1	13	10	10	30	22	22	47	34	34
Large	1	13	10	10	30	23	23	47	36	36
	2	13	10	10	30	23	23	47	36	36
CHARACTERS AVAILABLE FOR NON-STANDARD MARKINGS 3/32 Inch (2.5 mm) – 1/8 Inch (3 mm) – 3/16 Inch (5 mm)										
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z						. / - ,		1 2 3 4 5 6 7 8 9 0		

Buttons or Lenses with Non-standard Vertical Markings

Ordering Instructions

- Specify Catalogue Number of blank button or lens of desired colour, selected from listings on **Pages 2-98 – 2-100**.
- Specify size, legend desired, location and state “vertically marked” in Order Notes.

Note: Specify either 1/8 or 3/16 inch (3.2 or 4.8 mm) character height. Do not exceed maximum number of characters as outlined in table below.

Ordering Example:

Green Type K button to be marked with “RUN” “ON.”

Description	
Catalogue No.: E30KK20STAMP Letter Size: 3/16 inch (4.8 mm) Vertically Marked Pos. B – RUN Pos. E – ON	

Table 2-164. Maximum Number of Characters

Description	Type	Maximum Number of Characters	
		1/8 Inch (3.2 mm)	3/16 Inch (4.8 mm)
Buttons	A	7	5
	B	7	5
	C	4	3
	D	5	3
	E	7	5
Lenses	F	7	5
	G	7	5
	J	7	5
	K	3	2

Legend Plates

Legend plates for Type E30 Compact Pushbutton and Indicating Light operators hook directly onto the operator and are clamped in place when the operator locking nut behind the panel is secured.

Two and three span plates are designed for use where two or more operators are mounted adjacent to each other **on minimum horizontal mounting centres**. These legend plates mount in the same manner as single span units.

Blank Legend Plates and Legend Plates with Markings



When Ordering Legend Plates with Markings

- Catalogue Number of Blank Legend Plate
- Insert the following in Order Notes:
 - Legends Required
 - Size of Characters — 3/32, 1/8, 3/16 inch (2.4, 3.2, 4.8 mm)
 - Positions of legends on one line Standard and two line Large legend plates by alphas as shown in sketches on following page.

Ordering Example:

Three span legend plate to be marked “MASTER CONTROL,” “STATION A” and “STATION B.”

Description	
Catalogue No: E30KM3STAMP Letter Size: 1/8 inch (3.2 mm) Pos. C – MASTER CONTROL Pos. B – STATION A Pos. F – STATION B	

Table 2-165. Blank Legend Plate

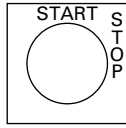
Type	One Span
	Catalogue Number
Black	
Standard	E30KM1
Large	E30KM4

E30 Series, Options — Faceplates and Light Units

Selector Switch Options

Faceplates

The basic Faceplate inserts listed below have a White background with black 1/8" high lettering — for a Black background with white lettering, add Suffix Letter "B" to listed Catalogue Number. Example: E30KN110B.



Catalogue Number

Table 2-166. Faceplates

Legend	Catalogue Number
Two-Position	
CENTRE – RIGHT	E30KN129
FOR – REV	E30KN101
HAND – AUTO	E30KN102
HIGH – LOW	E30KN103
INCH – RUN	E30KN114
JOG – RUN	E30KN104
LEFT – RIGHT	E30KN117
LOC – REM	E30KN116
MAN – AUTO	E30KN118
OFF – ON	E30KN105
ON – AUTO	E30KN126
ON – OFF	E30KN125
OPEN – CLOSE	E30KN106
RAISE – LOWER	E30KN127
RUN – JOG	E30KN107
SAFE – RUN	E30KN108
SEQ – TEST	E30KN115
SLOW – FAST	E30KN128
START – INCH	E30KN131
START – JOG	E30KN109
START – STOP	E30KN110
STOP – RESET	E30KN112
STOP – START	E30KN130
UP – DOWN	E30KN111
O – I	E30KN123
I – /	E30KN120

Three-Position

AUTO – OFF – HAND	E30KN49
FOR – OFF – REV	E30KN50
FOR – SAFE – REV	E30KN69
HAND – OFF – AUTO	E30KN51
JOG – SAFE – RUN	E30KN52
MAN – OFF – AUTO	E30KN68
ON – STOP – SAFE	E30KN71
OPEN – OFF – CLOSE	E30KN53
RUN – SAFE – JOG	E30KN70
UP – OFF – DOWN	E30KN54
II – O – I	E30KN124
\ – I – /	E30KN119

Blank Two- and Three-Position

BLANK – WHITE	E30KN76
BLANK – BLACK	E30KN76B

Alternate Key Removal Positions

To order control unit with other than standard key removal position(s) (maintained positions only), select option from table below and change 6th digit of listed Catalogue Number from **Pages 2-102 – 2-103** using Suffix Code shown. Example: E30TG1C, 3-Position Key Operated Selector Switch with key removable from **Right** only.

Spare Keys: Order Catalogue Number **E22KS2**.

Note: Key operated E30 Selector Switches are also available with Non-standard locks contact your local Eaton Distributor or call Customer Support Centre 1-800-268-3578.

Table 2-167. Key Removal Position

Description	Suffix Code
Right Only	1
Left Only	2
Right or Left	3
Centre Only	4
Right and Centre	5
Left and Centre	6
Right, Left and Centre	7

Light Unit Suffix Codes

Add Suffix Code listed below to the operator Catalogue Number from **Pages 2-102 – 2-103**. Make necessary price addition. Includes T3-1/4 bayonet base lamp except where noted.

Table 2-169. Light Units

Description	Suffix Code	Reference Cat. No.
Direct Voltage Light Unit — AC/DC		
Without Lamp	X1	E22D ①
With 6V Lamp	X2	E22D6
With 12V Lamp	X3	E22D12
With 24V Lamp	X4	E22D24
With 48V Lamp	X6	E22D50
With 60V Lamp	X7	E22D60
Resistor/Diode Type Light Unit — AC Only		
120V/60 Hz	X10	E22R2
Transformer Type Light Unit — AC Only		
120V/60 Hz	X11	E22TL1
240V/60 Hz	X12	E22TL2
480V/60 Hz	X14	E22TL4
Neon Light Unit ② — AC Only		
120V with Lamp	X15	E22DN120
240V with Lamp	X16	E22DN240

① The replacement LED lamps listed on **Page 2-65** can be used with this light unit. Lamps are available in red, green and yellow colours for 6, 12/14, 24 or 120V applications. Order illuminated selector switch with suffix code X1 and order LED lamps separately.

② Recommended for use with Clear, Amber or Yellow illuminated operators only.

Faceplates with Non-standard Markings

For Faceplates with Non-standard markings, specify Catalogue Number of blank faceplate plus Suffix "STAMP". In the Order Notes, specify legend desired.

Circuit Figurations

Type E22 Contact Blocks supplied are: 1NO block — E22B2; 1NC block — E22B1; 2NO block — E22B20; 1NO-1NC block — E22B11. Contact Block ratings per UL A600/Q600.

For more information see **Page 2-91**.

Illuminated Knob Colours

Standard knob colour for illuminated devices is Red (Suffix Code 2). To select alternate colour, change 6th digit of listed Catalogue Number from **Pages 2-102 – 2-103** using Suffix Code number from table below. Example: E30SF3_A, 2-Position Illuminated Selector Switch with Green knob.

Table 2-168. Knob Colour Selection




Colour	Suffix Code	Colour	Suffix Code
Clear	0	White	5
Green	3	Blue	6
Yellow	4	Amber	9

April 2009

E30 Series, Options — Enclosures

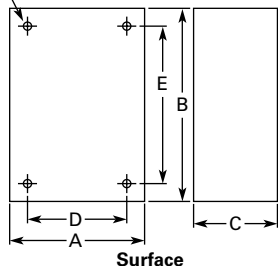
Enclosures

Table 2-170. Enclosures (Case and Cover) — Surface Mounting

	Number of Elements	2 Contact Block Depth	
		Catalogue Number	
 Die Cast Enclosure Cat. No. 10250TN11	Cast Enclosure — In-Line NEMA 4, 4X, 12, 13		
	1	10250TN11	
 Polyester Enclosure Cat. No. E34N52	Polyester — In-Line NEMA 3, 4X, 12		
	1	E34N51	
	2	E34N52	
	3	E34N53	
4	E34N54		
 Stainless Steel Enclosure 3 Holes 2 Contact Block Depth Cat. No. 10250TN35	Stainless Steel ① — In-Line NEMA 4, 4X, 12		
	1	10250TN33	
	2	10250TN34	
	3	10250TN35	
4	10250TN36		

① 14 gauge, type 304.

Table 2-171. Approximate Enclosure Dimensions

Number of Elements	Element Arrangement	Surface Mounting					Conduit Entrance	Approximate Dimensions
		Dimensions in Inches (mm)						
		Wide A	High B	Deep C	Mounting			
					D	E		
Cast								
1	In-Line	3.88 (98.6)	4.0 (101.6)	3.0 (76.3)	2.69 (68.3)	3.25 (82.6)	3/4	4 Mtg. Holes — 10-32 Screw Size for 1 - 4 Element Die Cast/ Stainless Steel Enclosure 7/32 Screw Size for Polyester 
Polyester								
1	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	②	
2	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)		
3	In-Line	3.81 (96.8)	8.88 (225.6)	3.38 (85.9)	2.94 (74.7)	7.13 (181.1)		
4	In-Line	3.81 (96.8)	11.13 (282.7)	3.38 (85.9)	2.94 (74.7)	9.38 (238.3)		
Stainless Steel								
1	In-Line	3.00 (76.2)	3.50 (88.9)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)	②	
2	In-Line	3.50 (88.9)	6.75 (171.5)	3.00 (76.2)	1.50 (38.1)	7.50 (190.5)		
3	In-Line	3.50 (88.9)	9.00 (228.6)	3.00 (76.2)	1.50 (38.1)	9.00 (228.6)		
4	In-Line	3.50 (88.9)	11.25 (285.8)	3.00 (76.2)	1.50 (38.1)	12.00 (304.8)		

② No conduit entrance holes provided. Drill as required.

Table 2-172. Spacing Increments Approximate

Type	Dimensions in Inches (mm)		
	F	G	H
Cast	2.44 (62)	2.5 (63.5)	—
Polyester	1.88 (47.8)	Min. 2.13 (54.1)	2.25 (57.2)
Stainless Steel	1.69 (42.9)	Min. 1.73 (43.9)	2.25 (57.2)

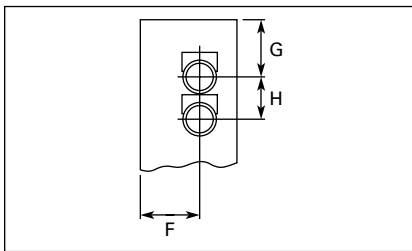


Figure 2-84. Spacing Increments for Enclosures

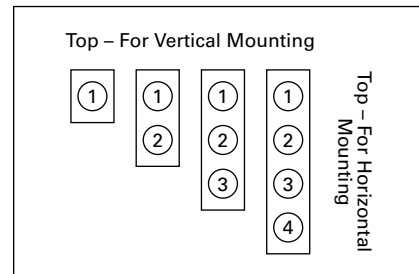

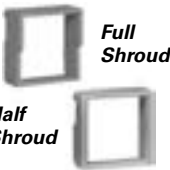











Figure 2-85. Enclosure Layouts

Accessories

Table 2-173. Accessories

Description	Colour/Type	Catalogue Number
	Black Red Green Yellow White Grey Orange Blue Brown	E30KR1 E30KR2 E30KR3 E30KR4 E30KR5 E30KR6 E30KR8 E30KR9 E30KR10
 Full Shroud  Half Shroud	Full Shroud (Grey) Half Shroud (Grey)	E30KT6 E30KT7
	Red with White Slide Red with Clear Slide	E30KR31 E30KR32
		E30KR30
	Short Button Extended Button	E30KT1 E30KT2
		E30KT3 ①
	Grey Enameled Stainless Steel	E30KT4 E30KT5
		E30KV1
		E22CW
		E30KV2

① Colour coordinating collars, padlock attachments or legend plates cannot be used with operators equipped with a transparent boot.

Note: If this boot is used in conjunction with operator types AD or AE, an extended type button must be used in the top position and a short button in the lower position.

Replacement Parts

Table 2-174. Replacement Light Units for E30 Components

Voltage AC and DC	Part Numbers — Receptacles without Lamps				
	Single Indicating Light	Dual Indicating Light	Single Light Single Pushbutton	Single Light Dual Pushbutton	Dual Light Dual Pushbutton
Full Voltage Type					
6V	57-2579-3A	57-2568A	57-2568A	57-2579-3A	57-2567A
12V	57-2579-3A	57-2568A	57-2568A	57-2579-3A	57-2567A
18/24V	57-2579-3A	57-2568A	57-2568A	57-2579-3A	57-2567A
28V	57-2579-3A	57-2568A	57-2568A	57-2579-3A	57-2567A
32V	57-2579-3A	57-2568-2A	57-2568-2A	—	57-2567A
48V	57-2579-3A	57-2568A	57-2568A	57-2579-3A	57-2567A
120V	57-2579-3A	57-2568A	57-2568A	57-2579-3A	57-2567A
Transformer Type					
120V	42-2672A	42-2663A	42-2663A	42-2671A	42-2664A
208V	42-2672-2A	42-2663-2A	42-2663-2A	42-2671-2A	42-2664-2A
240V	42-2672-3A	42-2663-3A	42-2663-3A	42-2671-3A	42-2664-3A
380V	42-2672-4A	42-2663-4A	42-2663-4A	42-2671-4A	42-2664-4A
480V	42-2672-5A	42-2663-5A	42-2663-5A	42-2671-5A	42-2664-5A
600V	42-2672-6A	42-2663-6A	42-2663-6A	42-2671-6A	42-2664-6A
Description and Part Numbers — Related Parts					
Inner Lens	28-1008	28-1010	28-1010	28-1010	28-1010
Retaining Nut	15-1885	15-1885	15-1885	15-1885	15-1885
Gasket	16-2092	16-2092	16-2092	16-2092	16-2092
Locking Ring	52-1116	52-1116	52-1116	52-1116	52-1116

Table 2-175. Replacement Lamps for E30 Illuminated Operators

Mfg. Lamp Type	Voltage	Base Style	Application	Part Number
6PSB	6V	T2 Slide	E30 Transformer and Full Voltage	28-1022
12PSB	12V	T2 Slide	E30 Full Voltage	28-1025
24PSB	24V	T2 Slide	E30 Full Voltage	28-1026
28PSB	28V	T2 Slide	E30 Full Voltage	28-1027
48PSB	48V	T2 Slide	E30 Full Voltage	28-1028
60PSB	60V	T2 Slide	E30 Full Voltage	28-1598
120PSB	120V	T2 Slide	E30 Full Voltage	28-1029
#259	6.3V	T3-1/4 Wedge	E30 Single Transformer	28-949



Dimensions

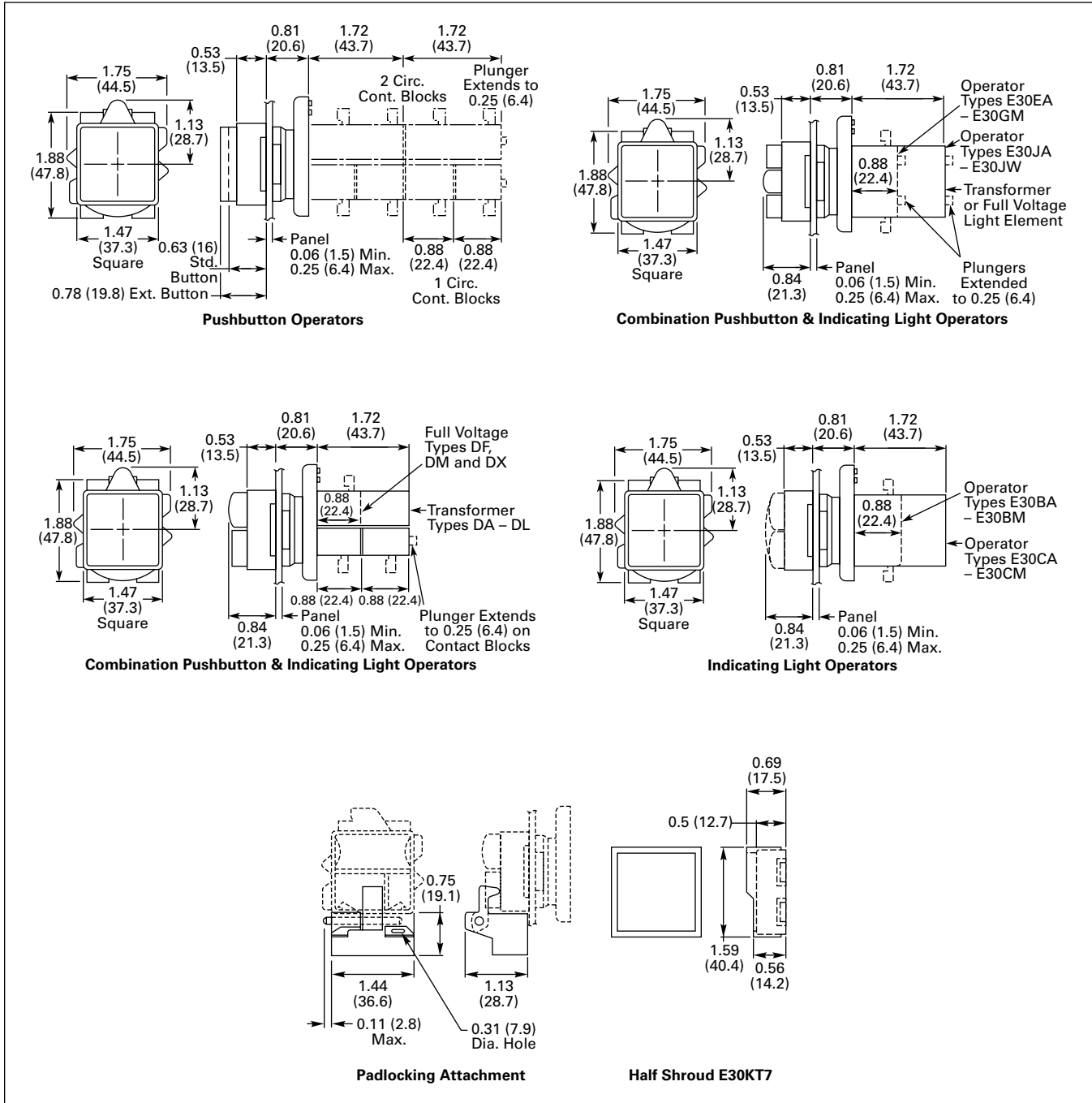


Figure 2-86. Approximate Dimensions in Inches (mm)

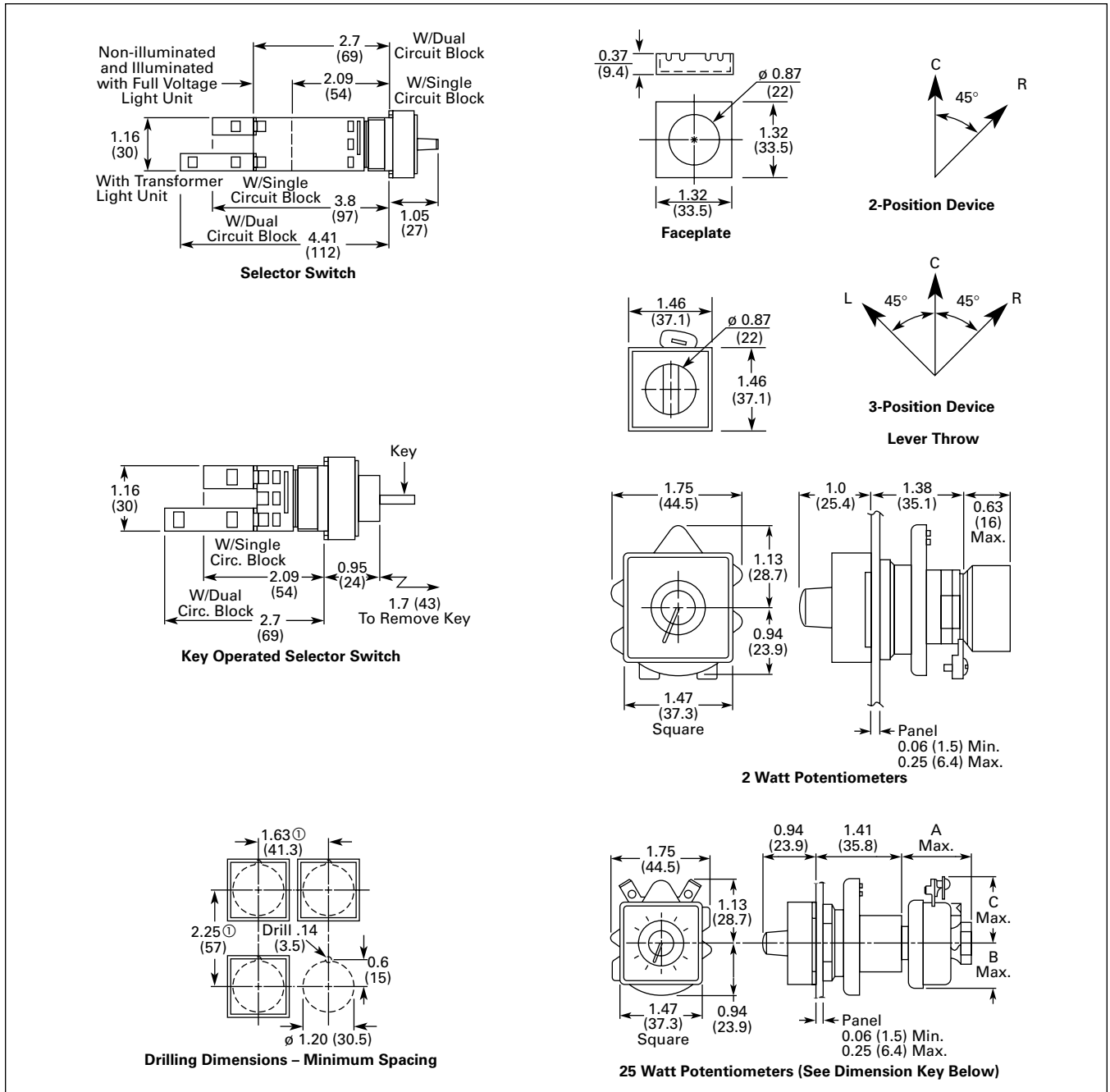


Figure 2-87. Approximate Dimensions in Inches (mm)

Drilling Dimensions — Minimum Spacing

Dimensions shown allow adequate space for the addition of one or two high legend plates and colour coordinating collars.

Note: Locating nib hole or notch is 0.136" (3.5 mm) drill. Alternate to drilling mounting holes use Greenlee Tool Co. punch (No. 730-S) to punch the hole and (No. 730-K) to punch the notch.

① Except 25 Watt Potentiometer — 1,000 – 25,000 Ohms, Vertical 2.38" (60 mm) Horizontal 1.88" (48 mm) — 50,000 Ohms, Vertical 3.5" (89 mm) Horizontal 2.63" (67 mm) and Test Module.

Table 2-176. 25 Watt Potentiometer Dimension Key

Resistance Range	Dimension in Inches (mm)		
	A	B	C
1,000 – 25,000 Ohms	1.375 (34.9)	0.75 (19.1)	1.625 (41.3)
50,000 Ohms	1.563 (39.7)	1.125 (28.6)	1.188 (30.2)

Note: Potentiometers used with E30 style operators Cat. Nos. E30KP10 and E30KP30 must have a 0.25" (6.4 mm) diameter 0.88" (22.2 mm) long shaft from mounting surface and a 0.38" x 0.38" (9.5 mm x 9.5 mm) long bushing.



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Product Description

The 30.5 mm pushbutton line features a zinc die cast construction with chrome-plated housing and mounting nut. The same durable construction is also available with the corrosive resistant E34 line of pushbuttons. See E34 section on **Pages 2-165 – 2-188**.

Reliability Nibs

Eaton's Cutler-Hammer® contact blocks feature enclosed silver contacts with pointed "reliability nibs" for reliable performance from logic level up to 600V. To ensure reliable switching, nibs bite through oxide which can form on silver contacts, eliminating the need for expensive logic level blocks for most applications.

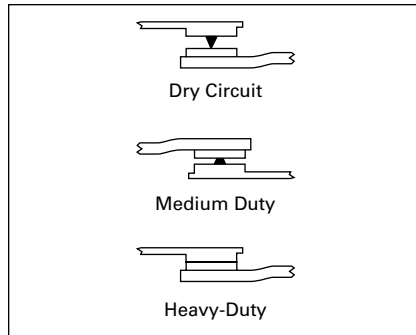
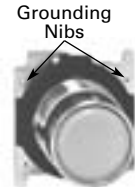


Figure 2-88. Reliability Nibs

Reliability nibs improve performance in dry circuit, corrosive, fine dust and other contaminated atmospheres. Under normal environmental conditions, the minimum operational voltage is 5V and the minimum operational current is 1 mA, AC/DC. For operation under a wider range of environmental conditions, logic level contact blocks with inert palladium tipped contacts are recommended.

Grounding Nibs

10250T line operators have "grounding nibs" — four metal points on the operator casting designed to bite through most paints and other coatings on metal panels to enhance the ground connection when the operator is securely tightened.



Grounding Nibs

Diaphragm Seal with Drainage Holes

Liquid Drainage

Eaton's Cutler-Hammer pushbutton operators offer front of panel drainage via holes in the operator bushing. Hidden from view by the mounting nut, these holes prevent buildup of liquid inside the operator, which can prevent operation in freezing environments. The holes also provide a route for escaping liquid in high pressure wash-downs, effectively relieving pressure from the internal diaphragm seal, ensuring reliable sealing in applications even beyond NEMA 4.

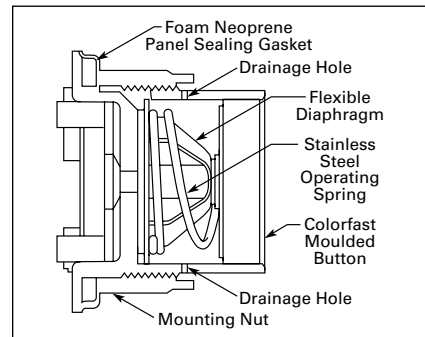


Figure 2-89. Diaphragm Seal



10250T Series

Features

- Heavy-duty zinc die cast construction
- Enclosed silver contacts with reliability nibs
- Diaphragm seals with drainage holes
- Grounding nibs on the operator casing

Benefits

- Reliability nibs improve contact reliability even under dry circuit and fine dust conditions
- Drainage holes prevent buildup of liquid inside the operator which can prevent operation in freezing environments
- Grounding nibs bit through paint and other coatings to provide secure ground

Contact Operation

Slow make and break. All normally closed contacts have positive opening operation, i.e., normally closed contacts are forced open in the event of contact weld or spring breakage.

Standards and Certifications

- CE EN60947-5-1
- UL 508 — File No. 131568
- CSA C22.2 No. 14 — File No. LR68551

Ingress Protection

When mounted in similarly rated enclosure —

- Standard Indicating Lights
 - UL (NEMA) 1, 2, 3, 3R, 3S, 4, 4X, 12, 13
 - IEC IP65
- All Other Operators
 - UL (NEMA) 1, 2, 3, 3R, 4, 4X, 12, 13
 - IEC IP65

Technical Data and Specifications

Mechanical Ratings

- Frequency of operation
 - All pushbuttons: 6000 operations/hr.
 - Key and lever selector switches: 3000 operations/hr.
 - Auto-latch devices: 1200 operations/hr.

- Life
 - Pushbuttons: 10 x 10⁶ operations
 - Contact blocks: 10 x 10⁶ operations
 - PresTest units: 10 x 10⁶ operations
 - Lever and key selector switches: 0.25 x 10⁶ operations
 - Twist to release pushbuttons: 0.3 x 10⁶ operations
- Shock resistance
 - Duration: 20 mS ≥ 5g

Climate Conditions

- Operating Temperature: 1° to 150°F (-17° to 66°C)
- Storage Temperature: -40° to 176°F (-40° to 80°C)
- Altitude: 6,562 ft. (2,000m)
- Humidity: Max. 95% RH @ 60°C

Terminals

- Marking
 - NC-NO on the contact block to meet the NEMA requirements. Dual marking system 1 – 2 for normally closed, 3 – 4 for normally open to meet BS5472 (Cenelec EN50 005)
- Clamps
 - Terminals are saddle clamp type for 1 x 22 AWG (0.34 mm²) to 2 x 14 AWG (2.5 mm²) conductors
- Torque = 7 lb-in (0.8 Nm)
- Degree of protection against direct electrical contact: IP2X with fingerproof shroud

Light Units

- Transformers: will withstand short circuit for 1 hour per IEC 60997-5-1
- Bulbs — average life
 - Transformer type: 20,000 hrs.
 - Resistor/direct voltage type: 2500 hrs. minimum @ rated V
 - LED: 60,000 to 100,000 hrs.

Note: For additional technical information, see Pub. **TD.7.4.T.E.04**.

Table 2-177. Contact Block

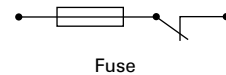
Description	Meet or Exceed NEMA Rating Designations A600, A300 and B300 for AC and P600 for DC						
	Volts AC 50 or 60 Hz				Volts DC		
	120	240	480	600	24/28	125	250
Make and Emerg. Interrupting Capacity (Amp)	60	30	15	12	5.7	1.1	0.55
Normal Load Break (Amp)	6	3	1.5	1.2	5.7	1.1	0.55
Thermal Current (Amp)	10	10	10	10	5.0	5.0	5.0
Voltamperes:							
Make and Emerg. Interrupting Capacity	7200	7200	7200	7200	138	138	138
Normal Load Break	720	720	720	720	138	138	138

Electrical Ratings

- Insulation: U_i = 660V AC or DC
- Thermal: I_{th} = 10A

Short Circuit Coordination to IEC/EN 60947-5-1

- Rated conditional short circuit current: 1 kA
- Fuse type: GE Power ControlsTIA 10, Red Spot Type gG, 10A, 660V AC, 460V DC, BS88-2, IEC 60269-2-1



- NEMA, UL rating: A600, P600
 - AC load life duty cycle 1200 operations/hour
 - 10A: 110V pf 0.4 – 1 x 10⁶ operations
 - 5A: 250V pf 0.4 – 1 x 10⁶ operations
 - 2A: 660V pf 0.4 – 1 x 10⁶ operations
- Switching capacity
 - AC15 rated make/break (11 x I_e at 1.1 x U_e)
 - 6A: 120V pf 0.3
 - 4A: 240V pf 0.3
 - 2A: 660V pf 0.3
 - DC13 rated make/break (1.1 x I_e at 1.1 x U_e)
 - 1.0A: 125V L/R ≥ 0.95 at 300 mS
 - .55A: 250V L/R ≥ 0.95 at 300 mS
 - .1A: 660V L/R ≥ 0.95 at 300 mS
 - 10A: 110V pure resistive
- Maximum ratings for logic level and hostile atmosphere application
 - Maximum amperes: 0.5A
 - Maximum volts: 120V AC/DC

10250T Series, Assembled Stations Point-of-Purchase Packaging

Point-of-Purchase Packaging

Features

- Most popular assembled 10250T devices
- See-through clam shell packaging
- Attractive colourful graphic insert
- Competitive replacement part numbers
- Multi-purpose packs include alternate legend plates and different coloured lenses where applicable



Table 2-178. Assembled 10250T Devices Point-of-Purchase Packaging





Product	Description	Catalogue Number
Pushbuttons		
Black Flush Pushbutton	1NO-1NC contact block. Also includes two square engraved legend plates: START and JOG.	10250T30B-POP
Red Extended Pushbutton	1NO-1NC contact block. Also includes one square engraved legend plate: STOP.	10250T31R-POP
Red Mushroom Pushbutton	1NO-1NC contact block. Also includes two square engraved legend plates: EMERG. STOP and STOP.	10250T32R-POP
Red Jumbo Mushroom Pushbutton	Engraved EMERG. STOP with 1NO-1NC contact block.	10250T33-POP
Selector Switches		
Black Knob Two-Position Selector Switch	1NO-1NC contact block. Also includes three square engraved legend plates: OFF/ON, HAND/AUTO and RUN/JOG.	10250T20KB-POP
Black Knob Three-Position Selector Switch	1NO-1NC contact block. Also includes 1 square engraved legend plate: HAND/OFF/AUTO.	10250T22KB-POP
Push-Pulls		
Red Non-illuminated Push-Pull	1NO-1NC contact block. Also includes two square engraved legend plates: EMERG. STOP and STOP.	10250T5B62-1-POP
Indicating Lights		
Red Indicating Light	Full voltage 24V AC/DC with two extra lenses – Green and Amber. Also includes two square engraved legend plates: RUN and JOG.	10250T206NC1N-POP
Red Indicating Light	Resistor 120V AC/DC with two extra lenses: Green and Amber. Also includes one square engraved legend plate: RUN and JOG.	10250T34R-POP
Illuminated Pushbuttons		
Red Illuminating Pushbutton	Full voltage 24V AC/DC with 1NO-1NC contact block and two extra lenses: Green and Amber. Also includes one square engraved legend plate: POWER ON.	10250T476C21-1-POP
Red Illuminating Pushbutton	Resistor 120V AC/DC with 1NO-1NC contact block and two extra lenses: Green and Amber. Also includes one square engraved legend plate: POWER ON.	10250T411C21-1-POP

Product Selection

Non-illuminated Momentary Pushbutton Units

- Flush, Extended, Mushroom Head or Jumbo Mushroom Head Operators

Table 2-179. Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact Type	Button Colour	Flush Button 	Extended Button 	Mushroom Button 	Jumbo Mushroom ^① 
		Flush Button — Black Cat. No. 10250T23B	Extended Button — Red Cat. No. 10250T31R	Mushroom Button — Red Cat. No. 10250T32R	Jumbo Mushroom — Red Cat. No. 10250T17213-3
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
1NO	Black Red Green Yellow Red — Engraved EMERG. STOP	10250T23B 10250T23R 10250T23G 10250T23Y —	10250T25B 10250T112-53 10250T25G 10250T25Y —	10250T26B 10250T122-53 10250T26G 10250T26Y —	10250T27B 10250T172-53 10250T27G 10250T27Y 10250T17213-53
1NC	Black Red Green Yellow Red — Engraved EMERG. STOP	10250T101-51 10250T102-51 10250T103-51 10250T104-51 —	10250T111-51 10250T25R 10250T113-51 10250T120-51 —	10250T121-51 10250T26R 10250T123-51 10250T124-51 —	10250T171-51 10250T27R 10250T173-51 10250T174-51 10250T29
1NO-1NC	Black Red Green Yellow Red — Engraved EMERG. STOP	10250T30B 10250T30R 10250T30G 10250T30Y —	10250T31B 10250T31R 10250T31G 10250T31Y —	10250T32B 10250T32R 10250T32G 10250T32Y —	10250T33B 10250T33R 10250T33G 10250T33Y 10250T33
2NO	Black Red Green Yellow Red — Engraved EMERG. STOP	10250T101-2 10250T102-2 10250T103-2 10250T104-2 —	10250T111-2 10250T112-2 10250T113-2 10250T120-2 —	10250T121-2 10250T122-2 10250T123-2 10250T124-2 —	10250T171-2 10250T172-2 10250T173-2 10250T174-2 10250T17213-2
2NC	Black Red Green Yellow Red — Engraved EMERG. STOP	10250T101-3 10250T102-3 10250T103-3 10250T104-3 —	10250T111-3 10250T112-3 10250T113-3 10250T120-3 —	10250T121-3 10250T122-3 10250T123-3 10250T124-3 —	10250T171-3 10250T172-3 10250T173-3 10250T174-3 10250T17213-3

① Anodized aluminum head is not suitable for use in ultraviolet light applications.







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10250T Series, Momentary Pushbutton Components

Pushbuttons

Table 2-180. Momentary Pushbutton Operators, Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Colour	Catalogue Number		
Flush Button ①				
	Black	10250T101		
	Red	10250T102		
	Green	10250T103		
	Yellow	10250T104		
	Grey	10250T105		
	White	10250T106		
	Blue	10250T108		
	Orange	10250T109		
Extended Button				
	Black	10250T111		
	Red	10250T112		
	Green	10250T113		
	Yellow	10250T120		
	White	10250T116		
	Blue	10250T118		
	Orange	10250T119		
Half Shrouded Button				
		Vertical	Horizontal	
		Black	10250T501	10250T511
	Red	10250T502	10250T512	
	Green	10250T503	10250T513	
	Yellow	10250T504	10250T514	
	Grey	10250T505	10250T515	
	White	10250T506	10250T516	
	Blue	10250T508	10250T518	
	Orange	10250T509	10250T519	
	Mushroom Button			
		Black	10250T121	
Red		10250T122		
Green		10250T123		
Yellow		10250T124		
Blue		10250T129		
Jumbo Mushroom Button ②				
	Black	10250T171		
	Red	10250T172		
	Red (EMERG. STOP)	10250T17213		
	Green	10250T173		
	Yellow	10250T174		
Low Operating Force — Jumbo Mushroom ②③				
	Black	10250ED1164-2		
	Red	10250ED1164-3		
	Green	10250ED1164-4		
	Yellow	10250ED1164-5		
	Clear	10250ED1164		

Note: To order complete assembled unit using one composite Catalogue Number, add Contact Block and Legend Plate Suffix to the end of Operator Catalogue Number. Example: 10250T101-1TS33



Operator
10250T101

+



Contact Block
10250T1

+



Legend Plate
10250TS33


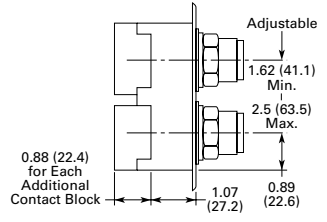
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① To order operator with factory assembled Extended Retaining Nut, **10250TA12**, for thick panel applications, add Suffix Letter **E** to listed Catalogue Number. Example: 10250T101E
 ② Anodized aluminum head is not suitable for use in ultraviolet light applications.
 ③ Operating Force — Standard = 2.4 lb; Low Force = 1.6 lb.

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Pushbuttons (Continued)

Table 2-181. Mechanically Interlocked Pushbutton Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Description	Catalogue Number	Overall Dimensions in Inches (mm)
	Minimum hole centres 1.62", maximum 250". Mounts in extra deep enclosures only. Black flush and green flush Black flush and long red Black flush and red mushroom head Black flush and lock-down red mushroom head	10250TA66 10250TA67 10250TA68 10250TA69 ①	
	Black flush and red jumbo mushroom head Green flush and long red Black long and long red Green flush and red mushroom head Green flush and black flush	10250TA76 10250TA72 10250TA73 10250TA77 10250TA75	

① NC contacts must be mounted behind lock-down mushroom head operator to ensure lockout.


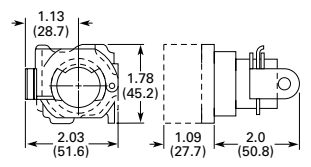
Lockout Pushbutton Operators with Padlock Attachments

The following pushbutton and mushroom operators include an integral padlock attachment for applications requiring lockout/tagout of specific machine functions. They are available in styles which allow locking of a button in the down position

(stopped position) or locking a button in the up position (to prevent starting). Select the "Hand" latch type which functions as a momentary pushbutton until the operator presses the button and moves the padlock attachment into position for locking, or choose the

"Spring Loaded" latch type where the padlock attachment springs into place when the button is pressed. Units accept a customer supplied 1/4" padlock.


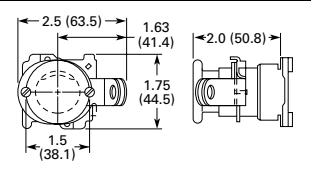

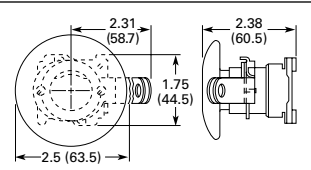
Table 2-182. Padlockable in the Down Position ② — **UL (NEMA) 3, 3R, 4, 4X, 12, 13**

	Operator Type	Colour	Latch Type	Catalogue Number	Overall Dimensions in Inches (mm)
	Flush Head	Red	Hand	10250TA16	
	Mushroom Head	Red	Hand	10250TA42	
		Red	Spring Loaded	10250TA45	
	Jumbo Head ③	Red	Hand	10250TA52	
	Red	Spring Loaded	10250TA55		
	Red (EMERG. STOP)	Spring Loaded	10250ED952		

② Operators can be latched down without a padlock. Padlock not included.

③ Jumbo mushroom heads are not recommended for use in applications where exposure to ultraviolet light exists.

Table 2-183. Padlockable in the Up Position ④ — **UL (NEMA) 3, 3R, 4, 4X, 12, 13**

	Operator Type	Colour	Latch Type	Catalogue Number	Overall Dimensions in Inches (mm)
	Mushroom Head	Black	Hand	10250TA41	
		Green	Hand	10250TA43	
	Jumbo Mushroom Head ⑤	Black	Hand	10250TA51	
		Green	Hand	10250TA53	
		Yellow	Hand	10250TA54	

④ Operators can be latched down without a padlock. Padlock not included.

⑤ Jumbo mushroom heads are not recommended for use in applications where exposure to ultraviolet light exists.

Note: Hand Attachment must be manually moved into place for locking. Spring Loaded: when operator is pressed — attachment springs into place. Must be moved manually to release button.

Pushbuttons (Continued)

Key Pushbutton Operator

These devices incorporate an integral locking mechanism which enables locking units in various positions (**Locked Down**), locking units to prevent operation (**Locked Up**) or setting unit to lock when the button is pressed (**Push to Lock**), requiring the key to be inserted to return to normal operation. With the key in the centre position, these operators function as a normal momentary pushbutton (**Free**).

Replacement Keys or Dissimilar Locks for Key Operators Below

Listed operators have identical locks and keys (Key Code H661) Catalogue Number 10250ED824. For dissimilar lock and key combinations, see listing on **Page 2-135**.

Table 2-184. Replacement Keys

Description	Catalogue Number
Replacement Keys (Code H661)	10250ED824

Table 2-185. Key Pushbutton Operator — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Key Position and Pushbutton Operations			Key Removal Positions	Vertical Mounting ①	Overall Dimensions in Inches (mm)
					Catalogue Number	
	3-Position					
	Lock Up	Free	Lock Down	All	10250T430	
	Lock Up	Free	Lock Down	L and R	10250T431	
	Lock Up	Free	Lock Down	C and R	10250T432	
	2-Position					
	Lock Up	Free	—	L and C	10250T433	
	Lock Up	Free	—	L	10250T434	
	—	Free	Lock Down	C and R	10250T435	
	—	Free	Lock Down	R	10250T436	
	—	Free	Push to Lock	C and R	10250T437	
—	Free	Push to Lock	R	10250T438		

① Horizontal mounting available on request.

Latch-In, Twist-to-Release Operator

Table 2-186. Operator Only with Button — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Description	Catalogue Number	Dimensions in Inches (mm)
	Latch-In, Twist-to-Release Operator with Red Mushroom Head Button	10250ED1043-4	

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April 2009

10250T Series, Assembled Devices — Illuminated Pushbutton Units

Illuminated Momentary Pushbutton Units

- LED or Incandescent
- Full Voltage, Resistor or Transformer Type
- Plastic Lenses



*24V Full Voltage
 Illuminated Pushbutton — Red
 Catalogue Number 10250T476C21-53*

Table 2-187. Illuminated Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Lamp	Type	Voltage	Colour	Illuminated Pushbutton			LED/Lamp Number			
				1NO	1NO-1NC	1NC				
				Catalogue Number	Catalogue Number	Catalogue Number				
LED	Full Voltage	24V AC/DC	Red	10250T397LRD24-53	10250T397LRD24-1	10250T397LRD24-51	Bayonet Base			
			Green	10250T397LGD24-53	10250T397LGD24-1	10250T397LGD24-51				
			Amber	10250T397LAD24-53	10250T397LAD24-1	10250T397LAD24-51				
			Yellow	10250T397LYD24-53	10250T397LYD24-1	10250T397LYD24-51				
			Blue	10250T397LLD24-53	10250T397LLD24-1	10250T397LLD24-51				
			White	10250T397LWD24-53	10250T397LWD24-1	10250T397LWD24-51				
	120V AC	Red	10250T397LRD2A-53	10250T397LRD2A-1	10250T397LRD2A-51					
		Green	10250T397LGD2A-53	10250T397LGD2A-1	10250T397LGD2A-51					
		Amber	10250T397LAD2A-53	10250T397LAD2A-1	10250T397LAD2A-51					
		Yellow	10250T397LYD2A-53	10250T397LYD2A-2	10250T397LYD2A-51					
		Blue	10250T397LLD2A-53	10250T397LLD2A-1	10250T397LLD2A-51					
		White	10250T397LWD2A-53	10250T397LWD2A-1	10250T397LWD2A-51					
Transformer	120V AC	Red	10250T411LRD06-53	10250T411LRD06-1	10250T411LRD06-51					
		Green	10250T411LGD06-53	10250T411LGD06-1	10250T411LGD06-51					
		Amber	10250T411LAD06-53	10250T411LAD06-1	10250T411LAD06-51					
		Yellow	10250T411LYD06-53	10250T411LYD06-1	10250T411LYD06-51					
		Blue	10250T411LLD06-53	10250T411LLD06-1	10250T411LLD06-51					
		White	10250T411LWD06-53	10250T411LWD06-1	10250T411LWD06-51					
Incandescent	Full Voltage	24V AC/DC	Red	10250T476C21-53	10250T476C21-1	10250T476C21-51	#757			
			Green	10250T476C22-53	10250T476C22-1	10250T476C22-51				
			Amber	10250T476C43-53	10250T476C43-1	10250T476C43-51				
			Yellow	10250T476C23-53	10250T476C23-1	10250T476C23-51				
			Blue	10250T476C24-53	10250T476C24-1	10250T476C24-51				
			Clear	10250T476C25-53	10250T476C25-1	10250T476C25-51				
			White	10250T476C26-53	10250T476C26-1	10250T476C26-51				
			Resistor	120V AC/DC	Red	10250T471C21-53		10250T471C21-1	10250T471C21-51	120MB
					Green	10250T471C22-53		10250T471C22-1	10250T471C22-51	
					Amber	10250T471C43-53		10250T471C43-1	10250T471C43-51	
					Yellow	10250T471C23-53		10250T471C23-1	10250T471C23-51	
					Blue	10250T471C24-53		10250T471C24-1	10250T471C24-51	
	White	10250T471C26-53			10250T471C26-1	10250T471C26-51				
	Transformer	120 AC	Red	10250T75R ①	10250T76R ①	10250T77R ①	#755			
			Green	10250T75G ①	10250T76G ①	10250T77G ①				
			Amber	10250T75A ①	10250T76A ①	10250T77A ①				
			Yellow	10250T75Y ①	10250T76Y ①	10250T77Y ①				
			Blue	10250T75B ①	10250T76B ①	10250T77B ①				
			White	10250T75C ①	10250T76C ①	10250T77C ①				
				10250T75W ①	10250T76W ①	10250T77W ①				

① For flashing module Catalogue Number 10250TFL1, add Suffix Code FM to listed Catalogue Number. Example: 10250T75RFM.

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 Replacement Lamps/LEDs **Page 2-156**





10250T Series, Assembled Devices — Indicating Light Units

Indicating Light Units

- LED or Incandescent
- Full Voltage, Resistor or Transformer Type
- Standard and PresTest Types
- Plastic Lenses

PresTest — This device incorporates a press-to-test feature whereby depressing the lens disconnects the light from the source being monitored and connects the lamp to a continuously energized circuit for immediate detection of faulty lamps.

Table 2-188. Indicating Light Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13 ①

Lamp	Type	Voltage	Colour	Indicating Light  24V Full Voltage Indicating Light — Red Catalogue Number	PresTest  120V AC Transformer PresTest — Green Catalogue Number	LED/Lamp Number
				Catalogue Number	Catalogue Number	
LED	Full Voltage	24V AC/DC	Red Green Amber Yellow Blue White	10250T197LRP24 10250T197LGP24 10250T197LAP24 10250T197LYP24 10250T197LLP24 10250T197LWP24	10250T297LRP24 10250T297LGP24 10250T297LAP24 10250T297LYP24 10250T297LLP24 10250T297LWP24	Bayonet Base
		120V AC	Red Green Amber Yellow Blue White	10250T197LRP2A 10250T197LGP2A 10250T197LAP2A 10250T197LYP2A 10250T197LLP2A 10250T197LWP2A	10250T297LRP2A 10250T297LGP2A 10250T297LAP2A 10250T297LYP2A 10250T297LLP2A 10250T297LWP2A	
	Transformer	120V AC	Red Green Amber Yellow Blue White	10250T181LRP06 10250T181LGP06 10250T181LAP06 10250T181LYP06 10250T181LLP06 10250T181LWP06	10250T221LRP06 10250T221LGP06 10250T221LAP06 10250T221LYP06 10250T221LLP06 10250T221LWP06	
Incandescent	Full Voltage	24V AC/DC	Red Green Amber Yellow Blue Clear White	10250T206NC1N 10250T206NC2N 10250T206NC19N 10250T206NC3N 10250T206NC4N 10250T206NC5N 10250T206NC6N	10250T235NC21 10250T235NC22 10250T235NC43 10250T235NC23 10250T235NC24 10250T235NC25 10250T235NC26	#757
		Resistor	120V AC/DC	Red Green Amber Yellow Blue Clear White	10250T201NC1N 10250T201NC2N 10250T201NC19N 10250T201NC3N 10250T201NC4N 10250T201NC5N 10250T201NC6N	10250T231NC21 10250T231NC22 10250T231NC43 10250T231NC23 10250T231NC24 10250T231NC25 10250T231NC26
	Transformer ②	120V AC	Red Green Amber Yellow Blue Clear White	10250T34R 10250T34G 10250T34A 10250T34Y 10250T34B 10250T34C 10250T34W	10250T74NR 10250T74NG 10250T74NA 10250T74NY 10250T74NB 10250T74NC 10250T74NW	#755





① Standard indicating lights are rated UL (NEMA) 3S as well.
 ② For flashing lamp add letter F to listed Catalogue Number. Example: 10250T34RF.

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Illuminated Pushbuttons and Indicating Lights

- LED or Incandescent
- Full Voltage, Resistor or Transformer Type

Table 2-189. Operators without Lens

Light Unit Type	Type	Voltage	Illuminated Pushbutton	Indicating Light	PresTest	Master Test	LED/Lamp Number
							
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	
Incandescent	Full Voltage AC/DC	6	10250T473	10250T203N	10250T232N	—	#755
		12	10250T474	10250T204N	10250T233N	—	#756
		24	10250T476	10250T206N	10250T235N	—	#757
		32	10250T477	10250T207N	10250T238N	—	#1828
		48	10250T478	10250T208N	10250T239N	—	#1835
	Resistor ^② AC/DC	120	10250T471	10250T201N	10250T231N	—	120MB
		240	10250T472	10250T202N	10250T240N	—	120MB
	Transformer AC Only ^③	24	10250T416	—	—	—	#755
		120	10250T411	10250T181N	10250T221N	10250T187N	
		240	10250T422	10250T182N	10250T222N	—	
		277	10250T419	10250T188N	—	—	
		380	10250T413	10250T183N	10250T223N	—	
		480	10250T414	10250T184N	10250T224N	—	
	Neon ^④ AC/DC	120	—	10250T226N	—	—	NE51H-R22
240		—	10250T227N	—	—	NE51H-R68	
Solid-State 50/60 Hz Only	120	—	—	—	10250T189N	120MB	
LED (LEDs not included) ^①	Full Voltage	—	10250T397L	10250T197L	10250T297L	—	Bayonet Base
		—	—	—	—	—	
	Transformer AC Only	24	10250T416L	—	—	—	
		120	10250T411L	10250T181L	10250T221L	—	
		240	10250T412L	10250T182L	10250T222L	—	
		277	10250T419L	10250T198L	—	—	
		380	10250T413L	10250T183L	10250T223L	—	
		480	10250T414L	10250T184L	10250T224L	—	
600	10250T415L	10250T185L	10250T225L	—			

- ① These units do not include lamps. Order LED separately to match lens colour. See Page 2-156 for LED Selection and Page 2-164 for Catalogue Numbering System.
- ② Resistor units are not available for use with LEDs, choose either transformer or full voltage LED style.
- ③ For flashing lamp, add letter F to listed Catalogue Number. Example: 10250T181NF.
- ④ Resistant to shock and vibration. For best illumination use amber, yellow or clear lens.

Table 2-190. Indicating and Master Test Lenses



	Colour	Plastic	Glass
		Catalogue Number	Catalogue Number
	Red	10250TC1N	10250TC7N
	Green	10250TC2N	10250TC8N
	Amber	10250TC19N	10250TC9N
	Yellow	10250TC3N	—
	Blue	10250TC4N	10250TC10N
	Clear	10250TC5N	10250TC11N
	White	10250TC6N	10250TC12N

Table 2-192. PresTest Lenses




	Colour	Plastic	Glass
		Catalogue Number	Catalogue Number
	Red	10250TC21	10250TC13N
	Green	10250TC22	10250TC14N
	Amber	10250TC43	10250TC15N
	Yellow	10250TC23	—
	Blue	10250TC24	10250TC16N
	Clear	10250TC25	10250TC17N
	White	10250TC26	10250TC18N

Table 2-191. Illuminated Pushbutton Lenses

	Colour	Catalogue Number
	Red	10250TC21
	Green	10250TC22
	Yellow	10250TC23
	Amber	10250TC43
	Blue	10250TC24
	Clear	10250TC25
	White	10250TC26

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10250T Series, Assembled Devices — Push-Pull Units

Push-Pull Units

- Two- and Three-Position
- Non-illuminated

Table 2-193. 2-Position Push-Pull Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13














	Operator Position ①		Button Type/Colour ②	Push-Pull Catalogue Number	Contact Type	Mounting Location	
	Pull	Push				A	B
2-Position Maintained Push, Maintained Pull							
 10250T5B62-1X 10250T5B63-1X  10250T5J63-1X	O	X	40 mm/Red	10250T5B62-1X	1NO 1NC		
	X	O	40 mm Engraved EMERG. STOP/Red	10250T5B63-1X			
	X	O	65 mm Alum. Engraved EMERG. STOP/Red	10250T5J63-1X			
	O	X	65 mm Alum. Engraved EMERG. STOP/Red	10250ED1080-2	1NO 1NC		
	X	O	Special Security Jumbo Mushroom Head				



Table 2-194. 3-Position Pull-Pull Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①			Button Type/Colour ②	Push-Pull Catalogue Number	Contact Type	Mounting Location	
Pull	Intermediate	Push				A	B
3-Position Maintained Push, Momentary Pull							
X	O	O	40 mm/ Black	10250T9B60-3X	1NC 1NC		
X	X	O	40 mm/Red	10250T9B62-3X			
			40 mm Engraved EMERG. STOP/Red	10250T9B63-3X			
3-Position Momentary Push, Momentary Pull							
X	O	O	40 mm/Black	10250T4B60-3X	1NC 1NC		
X	X	O	40 mm/Red	10250T4B62-3X			
O	O	X	40 mm/Black	10250T10B60-1X	1NO 1NC		
X	O	O	40 mm/Red	10250T10B62-1X			

① X = closed circuit, O = open circuit.

② To order different type or colour buttons, substitute the underlined characters with appropriate Suffix Code from the table below.
Example: 10250T5B64-1X.

Table 2-195. Button and Colour Selection Table

Standard — 40 mm	Colour	Suffix Code	Catalogue Number	Jumbo Mushroom Head ③ (Anodized) Aluminum — 65 mm	Colour	Suffix Code	Catalogue Number
	Red Red (EMERG. STOP) Green Black Blue	B62 B63 B61 B60 B64	10250TB62 10250TB63 10250TB61 10250TB60 10250TB64		Red Red (EMERG. STOP) Green Black Yellow	J62 J63 J61 J60 J64	10250TJ62 10250TJ63 10250TJ61 10250TJ60 10250TJ64

③ Anodized aluminum head is not suitable for use in ultraviolet light applications.

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10250T Series, Assembled Devices — Illuminated Push-Pull Units

Illuminated Push-Pull Units

- LED or Incandescent
- Full Voltage, Resistor or Transformer Type
- Two-Position Maintained



2-Position Push-Pull Operator with Red Button (Standard) and Full Voltage Light Unit

Table 2-196. 2-Position Illuminated Maintained Push, Maintained Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①		Lamp	Type	Voltage	Red Standard Push-Pull ② Catalogue Number	Contact Type	Mounting Location		LED/Lamp Number
Maintained Pull	Maintained Push						A	B	
O X	X O	LED	Full Voltage	24V AC/DC	<u>10250T597LRD24-1X</u>	1NO 1NC			Bayonet Base
				120V AC/DC	<u>10250T597LRD2A-1X</u>				
			Transformer	24V AC	<u>10250T589LRD06-1X</u>				
				120V AC	<u>10250T563LRD06-1X</u>				
O X	X O	Incandescent	Full Voltage	24V AC/DC	<u>10250T579C47-1X</u>	1NO 1NC			#757
				120V AC/DC	<u>10250T580C47-1X</u>				120MB
			Transformer	24V AC	<u>10250T589C47-1X</u>				
				120V AC	<u>10250T563C47-1X</u>				#755

① X = closed circuit, O = open circuit.

② To order different type or colour lens, substitute the underlined characters with appropriate Suffix Code from table below. Example: 10250T579C63-1X. For LEDs with different voltages see ordering example on Page 2-130.

Table 2-197. Lens and Colour Selection Table

Type	Lens Colour	Incand. Suffix Code	LED Suffix Code	Catalogue Number
Standard – 40 mm 	Red	C47	RD	10250TC47
	Red (EMERGENCY STOP)	C53	ED	10250TC53
	Green	C48	GD	10250TC48
	Blue	C49	LD	10250TC49
	Amber	C50	AD	10250TC50
	White	C51	WD	10250TC51
	Clear	C52	CD	10250TC52
	Side-Lighted Aluminum – 40 mm ③ 	Red	C57	RS
Red (EMERGENCY STOP)		C63	ES	10250TC63
Green		C58	GS	10250TC58
Blue		C59	LS	10250TC59
Amber		C64	AS	10250TC64
Yellow		C60	YS	10250TC60
White		C61	WS	10250TC61
Clear		C62	CS	10250TC62
Aluminum Transparent Centre – 40 mm ③ 	Red	C65	RH	10250TC65
	Green	C66	GH	10250TC66
	Amber	C67	AH	10250TC67

③ Clear anodized aluminum and coloured lens.

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10250T Series, Assembled Devices — Illuminated Push-Pull Units

Illuminated Push-Pull Units
(Continued)

- LED or Incandescent
- Full Voltage, Resistor or Transformer Type
- Three-Position Momentary



3-Position Push-Pull Operator with Red Button (Standard) and Transformer Light Unit

Table 2-198. 3-Position Illuminated Momentary Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ^①			Lamp	Type	Voltage	Red Standard Push-Pull ^②	Contact Type	Mounting Location		LED/Lamp Number	
Momentary Pull	Maintained Intermediate	Momentary Push				Catalogue Number		A	B		
			LED	Full Voltage	24V AC/DC	10250T1097LRD24-1X	1NO 1NC			Bayonet Base	
O	O	X			120V AC	10250T1097LRD2A-1X					
X	O	O			24V AC	10250T1089LRD06-1X					
X	O	O			120V AC	10250T1063LRD06-1X					
X X	O X	O O		Transformer	24V AC	10250T497LRD24-3X	1NC 1NC				Bayonet Base
					120V AC	10250T497LRD2A-3X					
					24V AC	10250T489LRD06-3X					
					120V AC	10250T463LRD06-3X					
O X	O O	X O	Incandescent	Full Voltage	24V AC/DC	10250T1079C47-1X	1NO 1NC			#757	
					120V AC	10250T1080C47-1X				120MB	
					24V AC	10250T1089C47-1X				#755	
					120V AC	10250T1063C47-1X					
X X	O X	O O		Transformer	24V AC/DC	10250T479C47-3X	1NC 1NC			#757	
					120V AC	10250T480C47-3X				120MB	
					24V AC	10250T489C47-3X				#755	
					120V AC	10250T463C47-3X					

① X = closed circuit, O = open circuit.

② To order different type or colour lens, substitute the underlined characters with appropriate Suffix Code from table on the bottom of Page 2-125. Example: 10250T1079C53-1X. For LEDs with different voltages see ordering example on Page 2-130.

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10250T Series, Assembled Devices — Illuminated Push-Pull Units & Potentiometers

Illuminated Push-Pull Units
(Continued)

- LED or Incandescent
- Full Voltage, Resistor or Transformer Type
- Three-Position — Maintained Push, Momentary Pull



3-Position Push-Pull Operator with Red Button (Standard) and Full Voltage Light Unit

Table 2-199. 3-Position Illuminated Maintained Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①			Lamp	Type	Voltage	Red Standard Push-Pull ② Catalogue Number	Contact Type	Mounting Location		LED/Lamp Number	
Momentary Pull	Maintained Intermediate	Maintained Push						A	B		
			LED	Full Voltage	24V AC/DC	10250T997LRD24-3X	1NC 1NC			Bayonet Base	
X	O	O			120V AC	10250T997LRD2A-3X					
X	X	O			24V AC	10250T989LRD06-3X					
X	X	O			120V AC	10250T963LRD06-3X					
X X	O X	O O	Incandescent	Full Voltage	24V AC/DC	10250T979C47-3X	1NC 1NC			#757	
					Resistor	120V AC				10250T980C47-3X	120MB
					Transformer	24V AC				10250T989C47-3X	#755
						120V AC				10250T963C47-3X	

① X = closed circuit, O = open circuit.

② To order different type or colour lens, substitute the underlined characters with appropriate Suffix Code from table on the bottom of Page 2-125. Example: 10250T979C53-3X. For LEDs with different voltages see ordering example on Page 2-130.

Potentiometers

Table 2-200. Potentiometer with Knob and Standard Dial Plate — Linear Type ±10% — UL (NEMA) 3, 3R, 4, 12, 13

Vertical or Horizontal One-Hole Mounting	Potentiometer Ohms	2 Watt (60V Max.) Single Potentiometer with Standard Aluminum Dial Plate ③④	Dimensions in Inches (mm)
		Catalogue Number	
 With Standard Aluminum Dial Plate	1000	10250T331	<p>Potentiometer</p>
	2500	10250T332	
	5000	10250T338	
10000	10250T333		
25000	10250T334		
50000	10250T335		
	Operator Only ⑤	10250T330	
	Alternative — Black Plastic Large Legend with Standard Markings	E34LP99	

③ Large dial plate with space for legend is available at no charge. To order, add suffix 36 to Catalogue Number. Example: 10250T331**36**. To order separately, see footnote ④ below.

④ Large dial plate has space at top for 15 letters. 3/32 inch high. For custom stamped legend plates, order legend plate as separate item **10250TR30** and specify stamping.

⑤ For use with commercially purchased potentiometers having shaft dimensions per dimension drawing on Page 2-160.

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10250T Series, Push-Pull Components

Push-Pull Operators

An illuminated Push-Pull pushbutton unit, arranged for one-hole mounting, can replace two pushbuttons and a pilot light or the non-illuminated form can replace two pushbuttons. These units are available in three basic types:

- **Maintained** — (Two-Position). Maintains in the pulled or pushed position until manually actuated to the opposite mode.
- **Momentary** — (Three-Position). Spring returns to an intermediate position when pulled or pushed and released.

- **Momentary Pull, Maintained Push** — (Three-Position). Spring returns to intermediate position when pulled. Maintains in pushed position until manually returned to intermediate (ready to reset) position. Maintained stop holds circuit open and will prevent other series connected operators from starting the system.

The Operators, Buttons, Contact Blocks, etc., are offered as building block components that can be intermixed to satisfy many requirements. This minimizes the need for a varied and costly inventory.



2-Position Maintained Push-Pull without Button on Lens
Catalogue Number 10250T5

Table 2-201. Typical Applications

Control	Line - Diagram	Operator	Circuits	Operator Mode		
3-Wire 3-Position Momentary		Momentary Push & Pull 10250T4	2NC Contact Block 10250T3	START (Mom.) 	Normal Pos. (Maint.) 	STOP (Mom.)
		Momentary Push & Pull 10250T10	1NO-1NC Contact Block 10250T1			
2-Wire 2-Position Maintained		Maintained Push & Pull 10250T5	1NC Contact Block 10250T51	START (Maint.) 	No Intermediate Position	STOP (Maint.)
3-Wire Momentary Pull Maintained Push		Maintained Push & Momentary Pull 10250T9	2NC Contact Block 10250T3	START (Mom.) 	Normal Pos. (Maint.) 	STOP (Maint.)

Note: A and B circuits shown in the application illustrations are defined in the "Application Guide" on the following page.

Push-Pull Operators (Continued)

Application Guide

To assist in the selection of contact blocks, the sketch to the right shows pictorially by symbols **A** and **B** locations of contact circuits after assembly of contact blocks and adapter to the operator. The chart below shows the effect of the push and pull operations on either NO or NC contacts. (X = contact closed, O = contact open)

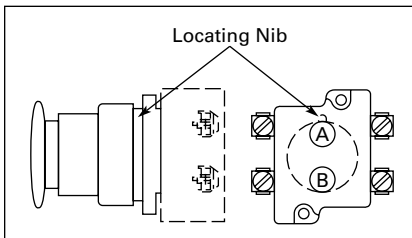


Figure 2-90. Contact Circuit Locations

Table 2-202. Push-Pull Operator Components

Type of Operator	Catalogue Number	Contact Block – Max. of 2 Blocks, 4 Circuits ①	Operator Position and Circuit Arrangement								
			Out – Pull		Intermediate		In – Push				
			Contact Block Mounting Location								
		A	B	A	B	A	B				
2-Position Operator without Lens											
Maintained Push-Pull	10250T5	1NO	O	or	O	No Intermediate Position	X	or	X		
		1NC	X		X		O	or	O		
		2NO	O		O		X		X		
		2NC	X		X		O		O		
Maintained Push-Pull with Anti-Theft Jumbo Mushroom	10250ED1080	1NO	O	or	O	No Intermediate Position	X	or	X		
		1NC	X		X		O	or	O		
		2NO	O		O		X		X		
		2NC	X		X		O		O		
3-Position Operator without Lens											
Momentary Push-Pull	10250T4 ①	1NO	O	or	O	O	or	O	X	or	O
		1NC	X		X	O	or	X	O	or	O
Maintained Push-Momentary Pull	10250T9 ①	2NO	O		O	O		O	X		O
		2NC	X		X	O		X	O		O
Momentary Push-Pull	10250T10 ①	1NO	O	or	O	O	or	O	X	or	X
		1NC	X		X	O	or	O	O	or	O
		2NO	O		O	O		O	X		X
		2NC	X		X	O		O	O		O

① Special function contact blocks shown on Page 2-147 CAN NOT be used with 3-position push-pull operators 10250T4, 10250T9 or 10250T10.

Button or Lens Page 2-130
 Contact Blocks Page 2-147
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10250T Series, Push-Pull Components

Push-Pull Operators (Continued)

Push-Pull Light Units, Lenses and Buttons

Table 2-203. Light Units for Illuminated Push-Pull Devices

Light Unit Type	Type	Voltage	Catalogue Number	LED/Lamp Number		
LED (LEDs not included) ①	Full Voltage	—	10250T97L	Bayonet Base		
	Transformer AC Only 50/60 Hz	24	10250T89L			
		120	10250T63L			
		208	10250T64L			
		240	10250T65L			
		277	10250T82L			
		380	10250T66L			
		480	10250T67L			
		600	10250T68L			
		Incandescent	Full Voltage AC or DC		6	10250T69
12	10250T70					
24/28	10250T79					
32	10250T83					
Resistor AC or DC	120		10250T80			
	240		10250T81			
	Transformer AC Only 50/60 Hz		24	10250T89	#755	
			120	10250T63		
			208	10250T64		
			240	10250T65		
277	10250T82					
380	10250T66					
480	10250T67					
600	10250T68					

① These units do not include lamps. Order LED separately to match lens colour, see Page 2-156.

Ordering example with one composite number:

Non-illuminated **10250T5** + **10250TB62** + **10250T1** =
10250T5B62-1X

Incandescent **10250T5** + **10250T79** + **10250TC47** + **10250T1** =
10250T579C47-1X

LED **10250T5** + **10250T97L** + **10250TC47** + Voltage Code + **10250T1** =
10250T597LRD24-1X



- 06 — 6V AC/DC
- 12 — 12V AC/DC
- 24 — 24V AC/DC
- 48 — 48V AC/DC
- 60 — 60V AC/DC
- 2A — 120V AC
- 2D — 120V DC

Table 2-204. Alternate Lenses for Illuminated Push-Pull Devices

	Colour	Incand. Suffix Code	LED ② Suffix Code	Catalogue Number
	Standard			
	Red	C47	RD	10250TC47
	Red (EMER. STOP)	C53	ED	10250TC53
	Green	C48	GD	10250TC48
	Blue	C49	LD	10250TC49
	Amber	C50	AD	10250TC50
	White	C51	WD	10250TC51
Clear	C52	—	10250TC52	
	Side-Lighted Anodized Aluminum Ring			
	Red	C57	RS	10250TC57
	Red (EMER. STOP)	C63	ES	10250TC63
	Green	C58	GS	10250TC58
	Blue	C59	LS	10250TC59
	Amber	C64	AS	10250TC64
	Yellow	C60	YS	10250TC60
	White	C61	WS	10250TC61
Clear	C62	—	10250TC62	
	Heavy-Duty Aluminum with Transparent Centre			
	Red	C65	RH	10250TC65
	Green	C66	GH	10250TC66
	Amber	C67	AH	10250TC67

② Suffix Codes should only be used for assembling composite Catalogue Numbers. To order lens above, order by Catalogue Number.

Table 2-205. Buttons for Non-illuminated Push-Pull Devices

	Colour	Suffix Code	Catalogue Number
	Standard		
	Red	B62	10250TB62
	Red (EMER. STOP)	B63	10250TB63
	Green	B61	10250TB61
	Black	B60	10250TB60
	Jumbo Mushroom Head (Anodized) Aluminum ③		
	Red	J62	10250TJ62
	Red (EMER. STOP)	J63	10250TJ63
	Green	J61	10250TJ61
	Black	J60	10250TJ60
Yellow	J64	10250TJ64	

③ Anodized aluminum head is not suitable for use in ultraviolet light applications.

Legend Plates

For a complete listing of available Legend Plates see Pages 2-150 – 2-151.

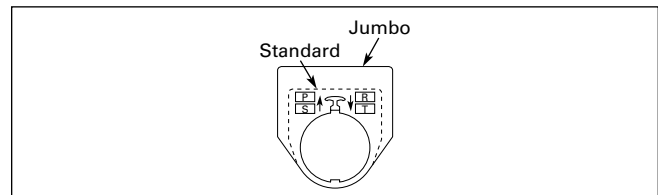


Figure 2-91. Legend Plates

- Contact Blocks Page 2-147
- Dimensions Pages 2-159 – 2-161
- Enclosures Pages 2-152 – 2-153
- Legend Plates Pages 2-150 – 2-151

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10250T Series, Assembled Devices — Selector Switch Units

Selector Switch Units

- Two-, Three- and Four-Position Maintained
- Non-illuminated and Illuminated



3-Position Maintained Switch
Catalogue Number
10250T21KB



4-Position Maintained Switch
Catalogue Number
10250T46KB

Table 2-206. 2-Position Selector Switch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①		Operator Action ②	Non-illuminated		Illuminated — 120V Transformer		Contact Type	Mounting Location	
			Black Knob ③	Black Lever ③	Red Knob ③	Red Lever ③		A	B
Catalogue Number	Catalogue Number		Catalogue Number	Catalogue Number	A	B			
X O	O X		<u>10250T20KB</u>	<u>10250T20LB</u>	<u>10250ED1117-KR</u>	<u>10250ED1117-LR</u>	1NC 1NO		

- ① X = closed circuit, O = open circuit.
- ② M = Maintained. S = Spring return in direction of arrow (→).
- ③ To order different type or colour selector switch, substitute the underlined character with appropriate Suffix Code from the Colour Selection table.
Example: 10250T20KG.

Table 2-207. 3-Position Selector Switch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ④			Operator Action ⑤	Non-illuminated		Illuminated — 120V Transformer		Contact Type	Mounting Location	
				Black Knob ⑥	Black Lever ⑥	Red Knob ⑥	Red Lever ⑥		A	B
Catalogue Number	Catalogue Number	Catalogue Number		Catalogue Number	Catalogue Number	A	B			
X O	O O	O X		<u>10250T21KB</u>	<u>10250T21LB</u>	<u>10250ED1117-2KR</u>	<u>10250ED1117-2LR</u>	1NO 1NO		
X O	O X	O O		<u>10250T22KB</u>	<u>10250T22LB</u>	<u>10250ED1117-3KR</u>	<u>10250ED1117-3LR</u>	1NO 2NC (Series) 1NO		

- ④ X = closed circuit, O = open circuit.
- ⑤ M = Maintained. S = Spring return in direction of arrow (→).
- ⑥ To order different type or colour selector switch, substitute the underlined character with appropriate Suffix Code from the Colour Selection table.
Example: 10250T20KG.

Table 2-208. 4-Position Selector Switch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ⑦				Operator Action ⑧	Non-illuminated		Illuminated — 120V Transformer		Contact Type	Mounting Location	
					Black Knob ⑨	Black Lever ⑨	Red Knob ⑨	Red Lever ⑨		A	B
Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number		Catalogue Number	Catalogue Number	A	B			
X O O O	O X O O	O O X O	O O O X		<u>10250T46KB</u>	<u>10250T46LB</u>	<u>10250ED1117-4KR</u>	<u>10250ED1117-4LR</u>	1NC 1NO 1NO 1NO 1NC		

- ⑦ X = closed circuit, O = open circuit.
- ⑧ M = Maintained. S = Spring return in direction of arrow (→).
- ⑨ To order different type or colour selector switch, substitute the underlined character with appropriate Suffix Code from the Colour Selection table.
Example: 10250T20KG.

Table 2-209. Colour Selection

Illuminated						Non-illuminated					
Colour	Code Letter	Colour	Code Letter	Colour	Code Letter	Colour	Code Letter	Colour	Code Letter	Colour	Code Letter
Red	R	White	W	Amber	A	Black	B	Green	G	Blue	L
Green	G	Blue	B	Clear	C	Red	R	White	W	Orange	O

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 Enclosures **Pages 2-152 – 2-153**
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10250T Series

Selector Switch Selection

Cam and Contact Block Selection

Selector switches in their varied forms (2-position, 3-position and 4-position) are a big factor contributing to the great flexibility of control that a well rounded line of “pushbuttons” can achieve. Because of their flexibility, they tend to cause difficulty with product selection and application. The following systematic approach should simplify that task.

Cam and contact block selection is better understood if you:

- Work with each incoming and outgoing wire/circuit separately.
- Recognize the terms NO and NC only identify the type of contact by its mode before mounting to the operator. The “X-O” table (Page 2-133) shows how that contact will act after assembly to the operator with the selected cam shape. X = closed circuit, O = open circuit.
- Up to six NO or NC contacts may be mounted behind each plunger location for a total of twelve contacts. Single circuit contact blocks have only one plunger with the other side of the block “open.” Therefore, single circuit contact blocks transmit motion to blocks behind them only for the position containing the circuit.
- Each cam has two separate lobes, each of which operates one of the two contact block plungers independently of each other. Those are identified as position A (locating nib side) and position B (opposite of locating nib). The position designations give direction in selecting and mounting of the contact blocks (see Figure 2-92).

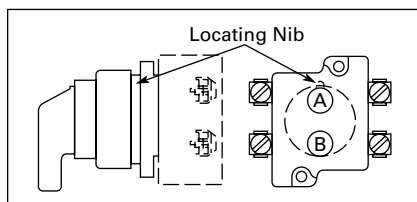


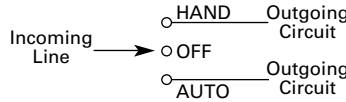
Figure 2-92. Contact Circuit Locations

Systematic Approach

Application: **HAND-OFF-AUTO** Selector Switch. In this circuit, one incoming line is distributed to two other outgoing circuits by the switch. The two circuits can be looked at individually.

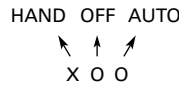
Step 1: Elementary Diagram.

Construct on paper, or in your mind, a simple elementary diagram of the switching scheme as follows:



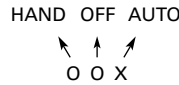
Step 2: “X-O” Pattern.

From the elementary diagram, you can construct an “X-O” diagram which describes when the contacts are to be closed (X) or open (O) in the various positions of the switch. The “X-O” for the **HAND** circuit looks like this:



In this circuit, you want a contact closed on the left (HAND) but open in the centre and right.

For the **AUTO** circuit, the “X-O” diagram would look like this:



Putting them together, the complete “X-O” diagram is:



Once the “X-O” diagram has been generated, the next step is to select the cam and contact block, or blocks, needed to perform the desired “X-O” functions. The selection table on the following page lists the various types (shapes) of cams by number to choose from and the type of contact and position to achieve the function outlined in your “X-O” diagram.

Step 3: Cam Selection.

The cam you select determines the operation of all contact blocks mounted to the operator. It is selected on the basis that it provides the simplest circuitry for the desired “X-O” diagram. The selection tables of the following page show all the “X-O” combinations. For the purpose of this example, the applicable portion of those tables is shown in Table 2-210.

Table 2-210. Example Selection Table

No.	“X-O” Pattern	Cam Code #2		Cam Code #3	
		Top A	Bottom B	Top A	Bottom B
1	X O O	NO	NC	NO	
4	O O X		NO		NO

① Wired in series.

Now to make the cam selection, make a simple worksheet such as:

		Cam 2	Cam 3
X O O	(A)NO – (B)NC	(A)NO	(B)NO
O O X	(B)NO	(B)NO	

It becomes immediately obvious that cam 3 is the better choice for two reasons, (1) the series combination can be avoided making it simpler to wire, (2) only two contacts are required, which is less expensive than the three contacts required by cam 2.

Step 4: Contact Block Selection.

Having selected the cam, contact block selection is simply a matter of gathering the A position and B position circuits into pairs which make up the most convenient contact block arrangement. If there is an imbalance in the number of circuits under A or B, then single circuit blocks must be selected for these leftover circuits.

Back to the worksheet, having selected cam 3 do this:



Step 5: Selector Switch Operator.

Lastly, you have to choose from the many types of operators — knob and lever in various colours or keyed. Also what combinations of maintained and spring return functions are required. Selection of these operators can be found on Page 2-134. For the above example you may want a 3-position maintained black knob, cam 3 — Catalogue Number 10250T1323.

The Complete Switch: 10250T1323 with one 10250T2 or, for one composite catalogue number, 10250T21KB found on Page 2-131.

Selector Switch Selection
(Continued)

Table 2-211. 2-Position Selector Switch Contact Block Selection

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function	
		Top Plunger A	Bottom Plunger B
1	X O	NC	NC
2	O X	NO	NO

Diagrams

Circuits shown illustrate connections to obtain a selector switch circuit combination and are shown with their appropriate line diagrams. Field wiring of jumper connections required as shown.

X = Closed Circuit
O = Open Circuit

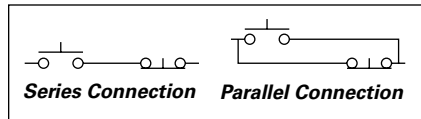


Figure 2-93. Wiring of Jumper Connections

Note: 4-Position Selector Switches limited to 4 contact blocks.

Contact Blocks

For selection and number of available contact blocks per operator, see **Page 2-147**.

Table 2-212. 3-Position Switch — Cam and Contact Block Selection

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function (Jumpers must be installed where indicated)			
		Operator with Cam Code #2		Operator with Cam Code #3	
		Mounting Location		Mounting Location	
		Top Plunger A	Bottom Plunger B	Top Plunger A	Bottom Plunger B
1	X O O	NO	NC	NO	
2	X X O		NC		NC
3	X O X	NO		NO	NO
4	O O X		NO		NO
5	O X X	NC	NO	NC	
6	O X O	NC		NC	NC

Table 2-213. 4-Position Switch — Contact Block Selection

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function		Combination No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function	
		Mounting Location				Mounting Location	
		Top Plunger A	Bottom Plunger B			Top Plunger A	Bottom Plunger B
1	X O O O	NC		10	X O X O	NC	NO
2	O X O O		NO			NC	NO
3	O O X O	NO		11	X X X O	NC	NO
4	O O O X		NC			NC	NO
5	X O O X	NC	NC	12	O X X X	NO	NC
6	O X X O	NO	NO			NO	NC
7	O O X X	NO	NC	13	X O X X	NO	NC
8	X X O O	NC	NO			NO	NC
9	O X O X		NO	14	X X O X	NC	NO

10250T Series, Selector Switch Components

Selector Switch Operators



2-Position Maintained Black Knob Selector Switch – Cam 1
Cat. No. 10250T1311



3-Position Maintained Black Lever Selector Switch – Cam 3
Cat. No. 10250T3023



2-Position Maintained Horizontal Mount, Key Removal #1 Keyed Selector Switch – Cam 1
Cat. No. 10250T16111

Selector Switch Operators with Caps

Table 2-214. Selector Switch Operators with Caps — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Positions	Operator Action ①	Black Knob Selector Switch – Vertical Mounting ③		Black Lever Selector Switch – Vertical Mounting ③	
		Cam Code ②	Catalogue Number	Cam Code ②	Catalogue Number
2-Position – 60° Throw		1	10250T1311	1	10250T3011
		1	10250T1371	1	10250T3071
3-Position – 60° Throw		2 3	10250T1322 10250T1323	2 3	10250T3022 10250T3023
		2 3	10250T1332 10250T1333	2 3	10250T3032 10250T3033
		2 3	10250T1342 10250T1343	2 3	10250T3042 10250T3043
		2 3	10250T1352 10250T1353	2 3	10250T3052 10250T3053
4-Position – 40° Throw		7	10250T1367	7	10250T3067

① M = Maintained. S = Spring return in direction of arrow (→).

② For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on Pages 2-132 – 2-133.

③ Field convertible to Horizontal Mounting or order operator only and separate operator cap.

Table 2-215. Key Operators with Cam — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Positions	Operator Action ④	Cam Code ⑤	Optional Key Removal Positions ⑥	Vertical Mounting	Horizontal Mounting
				Catalogue Number	Catalogue Number
2-Position – 60° Throw		1	1, 2, 3	10250T1511_	10250T1611_
		1	2	10250T1571_	10250T1581_
3-Position – 60° Throw		2 3	1 – 7	10250T1522_ 10250T1523_	10250T1622_ 10250T1623_
		2 3	1, 4, 5	10250T1532_ 10250T1533_	10250T1632_ 10250T1633_
		2 3	4	10250T1542_ 10250T1543_	10250T1642_ 10250T1643_
		2 3	2, 4, 6	10250T1652_ 10250T1653_	10250T1662_ 10250T1663_
4-Position – 40° Throw		7	7	10250T1677_	10250T1687_

④ M = Maintained. S = Spring return in direction of arrow (→).

⑤ For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on Pages 2-132 – 2-133.

⑥ Choose key removal position required for application from Table 2-216 on Page 2-135. Add key removal Code No. to listed Catalogue Number.
Example: 10250T15112.

Accessories Pages 2-154 – 2-155
 Contact Blocks Page 2-147
 Dimensions Pages 2-159 – 2-161
 Enclosures Pages 2-152 – 2-153
 Legend Plates Pages 2-150 – 2-151

Selector Switch Operators (Continued)

Table 2-216. Key Removal Positions

Code Suffix	Key Removal Positions	Code Suffix	Key Removal Positions
1	Right Only	5	Right & Centre
2	Left Only	6	Left & Centre
3	Right & Left	7	All Positions
4	Centre Only		

Note: Key removal in “spring return from” positions not recommended.

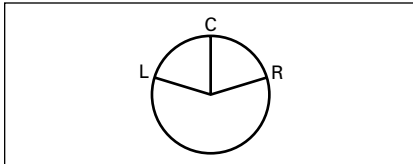


Figure 2-94. Key Removal Positions

Replacement Keys or Dissimilar Locks for Key Operators

Operators listed on **Page 2-134** have identical locks and keys (Key Code H661) Catalogue Number 10250ED824.

Table 2-217. Replacement Key

Description	Catalogue Number
Replacement Keys (Code H661)	10250ED824

10250T Series, Selector Switch Components

Selector Switch Operators (Continued)

Selector Switch Operators without Caps

Note: Operators below can be ordered with caps assembled to them by adding the Code Number from **Table 2-219** to the end of Catalogue Number below.
Example: 10250T4011KB



2-Position Selector Switch Maintained, Cam Code 1 Catalogue Number

Table 2-218. Selector Switch Operators without Caps

Positions	Operator Action ①	Cam Code ②	Catalogue Number
2-Position – 60° Throw		1	10250T4011
		1	10250T4081
3-Position – 60° Throw		2 3	10250T4022 10250T4023
		2 3	10250T4032 10250T4033
		2 3	10250T4042 10250T4043
		2 3	10250T4052 10250T4053
4-Position – 40° Throw		7	10250T4067

① M = Maintained. S = Spring return in direction of arrow (→).
② For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on **Pages 2-132 – 2-133**.

Table 2-219. Operating Caps

Colour	Knob	Lever
	Catalogue and Code Number	Catalogue and Code Number
Black	10250TKB	10250TLB
Red	10250TKR	10250TLR
Green	10250TKG	10250TLG
Yellow	10250TKY	10250TLY
White	10250TKW	10250TLW
Grey	10250TKA	10250TLA
Blue	10250TKL	10250TLL
Orange	10250TKO	10250TLO

Colour	Lever	Coin Slot
	Catalogue and Code Number	Catalogue and Code Number
Black	10250TSB	10250TCB
Red	10250TSR	10250TCR
Green	10250TSG	10250TCG
Yellow	10250TSY	10250TCY
White	10250TSW	10250TCW
Grey	10250TSA	10250TCA
Blue	10250TSL	10250TCL
Orange	10250TSO	10250TCO

③ Designed for added ingress protection. For use in maintained operators only.

Accessories **Pages 2-154 – 2-155**
 Contact Blocks **Page 2-147**
 Dimensions **Pages 2-159 – 2-161**
 Enclosures **Pages 2-152 – 2-153**
 Legend Plates **Pages 2-150 – 2-151**

Illuminated Selector Switch Operators

Illuminated Selector Switches without Caps



*2-Position Maintained 120V AC
Transformer Selector Switch,
Cam Code 1
Catalogue Number 10250T5971*

Table 2-220. Operator without Knob or Lever

Positions	Operator Action ①	Transformer Type — 50/60 Hz			Full Voltage Type — AC or DC ④		
		6 Volt #755 Lamp			Lamps: 6V — #755, 12V — #756, 24V — #757, 48V — #1835, 120/240V — 120MB		
		Voltage	Cam Code ③	Catalogue and Code Number ②	Voltage	Cam Code ③	Catalogue and Code Number ②
2-Position – 60° Throw		24	1	10250T5961	6	1	10250T6201
		120		10250T5971	12		10250T6211
		208		10250T6511	24		10250T6221
		240		10250T5981	48		10250T6231
		380		10250T5991	120		10250T6361
		480		10250T6001	240 ⑤		10250T6371
3-Position – 60° Throw		24	+ 2 or 3	10250T602_	6	+ 2 or 3	10250T624_
		120		10250T603_	12		10250T625_
		208		10250T652_	24		10250T626_
		240		10250T604_	48		10250T627_
		380		10250T605_	120		10250T638_
		480		10250T606_	240 ⑤		10250T639_
		24	+ 2 or 3	10250T654_	6	+ 2 or 3	10250T612_
		120		10250T620_	12		10250T632_
		208		10250T655_	24		10250T642_
		240		10250T656_	48		10250T672_
		380		10250T657_	120		10250T622_
		480		10250T658_	240		10250T682_
		24	+ 2 or 3	10250T660_	6	+ 2 or 3	10250T613_
		120		10250T621_	12		10250T633_
		208		10250T661_	24		10250T643_
		240		10250T662_	48		10250T673_
		380		10250T663_	120		10250T623_
		480		10250T664_	240		10250T683_
		24	+ 2 or 3	10250T614_	6	+ 2 or 3	10250T628_
		120		10250T615_	12		10250T629_
		208		10250T653_	24		10250T630_
		240		10250T616_	48		10250T631_
		380		10250T617_	120		10250T640_
		480		10250T618_	240 ⑤		10250T641_
4-Position – 40° Throw		24	7	10250T6087	6	7	10250T6327
		120		10250T6097	12		10250T6337
		208		10250T6547	24		10250T6347
		240		10250T6107	48		10250T6357
		380		10250T6117	120		10250T6427
		480		10250T6127	240 ⑤		10250T6437
600	10250T6137						

① M = Maintained. S = Spring return in direction of arrow (→).

② Operator includes lens gasket and lens attachment screws.

③ For selection of the proper cam and contact block, to obtain the proper circuit sequence, see selection table on Pages 2-132 – 2-133.

④ Full voltage light units can be used at other than listed voltages by changing lamp. Replacement lamps are listed on Page 2-156.

⑤ Resistor type. May generate excess heat if used in high density.

Table 2-221. Illuminated Knobs and Levers

Colour ⑥	Knob 	Lever 
	Cat. and Code No.	Cat. and Code No.
Red	10250TER	10250TFR
Green	10250TEG	10250TFG
Yellow	10250TEA	10250TFA
Blue	10250TEL	10250TFL
Clear	10250TEC	10250TFC
White	10250TEW	10250TFW
Amber	10250TEM	10250TFM

⑥ Amber, Clear and White lenses have a black arrow (pointer), Red, Green and Blue lenses have a white arrow (pointer).

Accessories Pages 2-154 – 2-155
 Contact Blocks Page 2-147
 Dimensions Pages 2-159 – 2-161
 Enclosures Pages 2-152 – 2-153
 Legend Plates Pages 2-150 – 2-151

10250T Series, Joystick Units and Components

Joystick Units

Table 2-222. Joystick Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Two-Position	Operator Position ①			Operator Action ②	2-Position Assembled Unit Catalogue Number ③	Contact Type	Mounting Location	
	Up	Centre	Down				A	B
					10250T452-3X	1NC 1NC		

- ① X = closed circuit, O = open circuit.
- ② M = Maintained. S = Spring return in direction of arrow (→).
- ③ Field convertible momentary to maintained or vice versa.

Joysticks

Two-Position Joystick Operators

The device mounts in the standard 30.5 mm mounting hole. Allow sufficient panel space for lever movement.

The maximum travel of the knob operator (full up to full down) is 2.2" (24°) momentary, 2.5" (30°) maintained, but ample space for lever operation must

be allowed. These operators are field convertible from momentary to maintained operation or vice versa.

The use of NC contacts is preferred because they provide positive drive contact opening and a direct relationship between lever movement and affected terminal, i.e., up movement affects the top terminals.



2-Position Joystick Operator

Table 2-223. 2-Position Joystick Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact Block Limitations	Description ④	Catalogue Number	Overall Dimensions in Inches (mm)
Momentary Mode 4NC Contact Blocks Max. 3NO Contact Blocks Max. Maintained Mode 2 Contact Blocks Max.	2-Position Operator Only — AC Applications Only Momentary Up and Down Maintained Up — Momentary Down Maintained Down — Momentary Up Maintained Up and Down	10250T452 10250T4521 10250T4522 10250T4525	

- ④ Field convertible momentary to maintained or vice versa. To expedite shipment of maintained types, order momentary operator 10250T452 which is a stocked device.

Table 2-224. Contact Block Operation and Selection

Handle Position ⑤			Contact Block		Mounting Location ⑥⑦	
Up	Centre	Down	Catalogue Number	Type ⑦	Top	Bottom
					A	B
X	O	O	10250T51	1NC		
O	O	X	10250T51	1NC		
O	X	O	10250T45	2LONC (Series)		
X	O	O	10250T3	1NC		
O	O	X		1NC		
X	X	O	10250T45	1LONC		
O	X	X		1LONC		
X	O	O	10250T44 ⑧	1NC		
O	O	X		1NO		
O	O	X		1NC		
X	O	O		1NO		

- ⑤ Bolded circuit corresponds to "X-O" circuit selection. X = closed circuit, O = open circuit.
- ⑥ See **Figure 2-95** for "A" and "B" mounting location.
- ⑦ NO = Normally Open, NC = Normally Closed, LONC = Late Opening Normally Closed.
- ⑧ Four circuits in single block depth — rated 300V max.

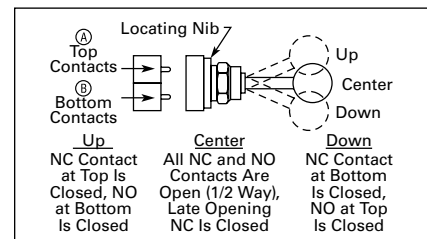


Figure 2-95. A and B Mounting Location

Application Caution

Joystick operators are not recommended on certain DC applications above 24V DC which may involve lightly engaging the contacts (teasing) to achieve speed control, positioning, jogging, etc. Excessive arcing and deterioration of the contacts will occur.

Contact Blocks **Page 2-147**
 Enclosures **Pages 2-152 – 2-153**
 Legend Plates **Pages 2-150 – 2-151**

April 2009

10250T Series, Joystick Components

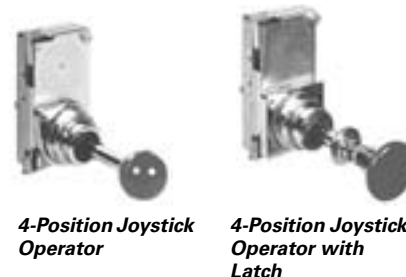
Joysticks (Continued)

Four-Position Joystick Operators

The joystick operated control unit is intended for AC application only. For other use, see **Application Caution** on preceding page.

The panel area required for the 4-position operator is equivalent to two standard pushbutton operators.

Note: The latch holds the lever in the centre position. The trigger latch must be released before lever can moved into any position.



4-Position Joystick Operator

4-Position Joystick Operator with Latch

Table 2-225. 4-Position Joystick Operators — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact Block Limitations	Description ①	Catalogue Number	Overall Dimensions in Inches (mm)
4 Contact Blocks Max. — 2 in Each Position	Operator Only — AC Application Only		
	4-Position — without Latch	10250T451_	
	4-Position — with Latch	10250T461_	
	Hole Plug		
	To plug unused hole	10250TA7	

① Momentary operators — spring return to centre. For maintained operators add Suffix Code from Table 2-226. Example: 10250T45110. Operator without latch, maintained in left and right positions.

Field Conversion — Gate

The factory assembled 4-position operator is assembled with a gate arranged for four handle positions.

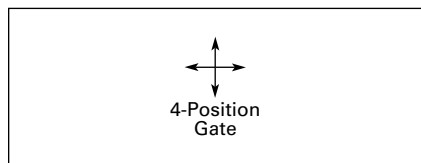


Figure 2-96. Handle Positions

Three additional gates, supplied with every operator, allow on the job conversion to 3- or 8-position operation as illustrated below.

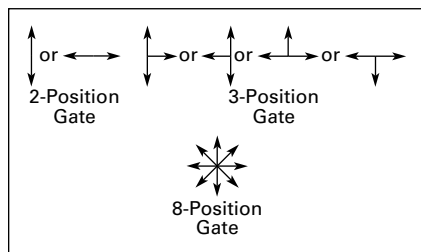


Figure 2-97. 2-, 3- or 8-Position Operation

The 8-position gate controls the four functions shown as “Up,” “Down,” “Left” and “Right.” The remaining four diagonal positions each actuate two adjacent functions (see Figure 2-98); for example, “Left Down” actuates both “Left” and “Down.” The operator may be arranged for spring return of handle to centre position, or maintained in up to eight positions (see description of maintained position operator).

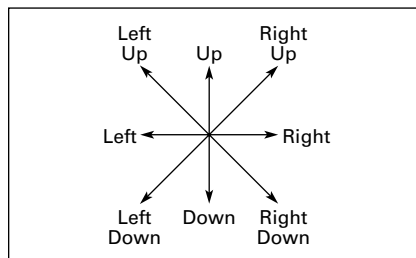


Figure 2-98. Adjacent Functions

Maintained Position

For maintained position (non-spring return), locate required maintained position or positions of operating lever in Table 2-226 and add appropriate Suffix Number to the Catalogue Number selected from Table 2-225.

Table 2-226. Maintained Positions

Maintained Positions				Suffix Number
Up	Down	Left	Right	
X	—	—	—	1
—	X	—	—	2
—	—	X	—	3
—	—	—	X	4
X	X	—	—	5
X	—	X	—	6
X	—	—	X	7
—	X	X	—	8
—	X	—	X	9
—	—	X	X	10
X	X	X	—	11
X	X	—	X	12
X	—	X	X	13
—	X	X	X	14
X	X	X	X	15

Note: On an 8-position gate, when an adjacent vertical and horizontal position are both maintained, the included diagonal position is also maintained.

Contact Blocks Page 2-147
Enclosures Pages 2-152 – 2-153
Legend Plates Pages 2-150 – 2-151

10250T Series, Joystick Components

Joysticks (Continued)

Four-Position Joystick Operators (Continued)

Contact Block Operation

Contact blocks mount directly to the back of the operator. For reliable operation, the maximum number of contact blocks that should be installed behind each operator lever is 2 (4 total).

Figure 2-99 identifies the circuits activated by each of the eight possible lever positions. Contact block plungers 1, 2, 3, 4 are depressed (change state) when handle is in the position indicated by arrows below.

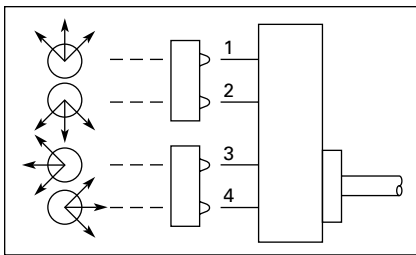


Figure 2-99. Circuit Activation

2

Note: Joystick in its resting state, centre position, does not activate contact block plungers.

Ordering Example:

Suppose you are looking for a 4-position momentary joystick without a latch and the following circuit arrangements. X = Closed Circuit, O = Open Circuit.

Table 2-227. Example Circuit Arrangements

	Up	Down	Left	Right
1st Circuit	X	X	X	X
2nd Circuit	X	O	O	X

The contact blocks and their mounting locations would be as follows:

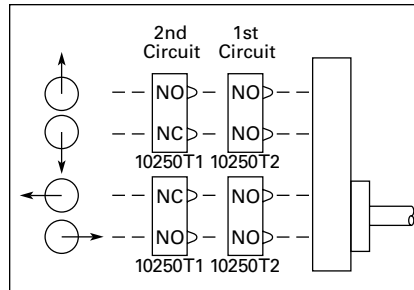


Figure 2-100. Example Contact Blocks and Locations

A complete bill of material for this example would include:

Table 2-228. Example Order

Qty.	Catalogue Number
1	10250T451
2	10250T2
2	10250T1

Blank Legend Plates for Joystick Operators

When ordering engraved legend plates, order by Catalogue Number and insert the following into Order Notes:

- Legend required
- Size of characters: 3/16, 1/8, 3/32 inch (4.8, 3.2, 2.4 mm)
- Location by letter (A – N)

Locations K and M can accommodate up to 2 lines horizontally; L and N up to 2 lines vertically.

Maximum number of characters:

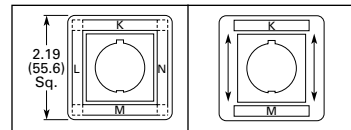
- Horizontal
3/16" – 13, 1/8" – 14, 3/32" – 19
- Vertical
3/16" – 10, 1/8" – 13, 3/32" – 14

Ordering Example:

2-position legend plate to be marked "UP" "DOWN."

Catalogue No.: 10250TJ2S4STAMP
Letter Size: 3/16 inch (4.8 mm)
Pos. K – UP
Pos. M – DOWN

Table 2-229. 2-Position



Catalogue Number	Catalogue Number
10250TJS3	10250TJS4

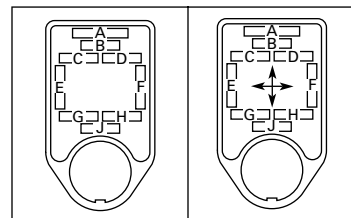
Blank Plate

10250TJS3	10250TJS4
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Engraved Plate

10250TJS3STAMP	10250TJS4STAMP
----------------	----------------

Table 2-230. 4-Position



Catalogue Number	Catalogue Number
10250TJS1	10250TJS2

Blank Plate

10250TJS1	10250TJS2
-----------	-----------

Engraved Plate

10250TJS1STAMP	10250TJS2STAMP
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Roto-Push® Units

Two-Position Momentary

Complete assembled Two-Position Roto-Push Units are listed below. These operators have black flush buttons and are arranged for vertical mounting. Order legend plates separately.

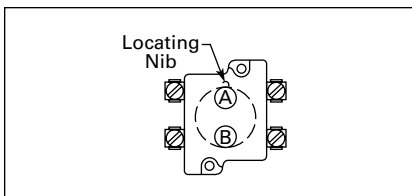










Figure 2-101. Mounting Location

Table 2-231. Roto-Push Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13


	Typical Applications (Most Common Examples)	Operator Position ①				Roto-Push Assembled with Contact Blocks	Contact Type	Mounting Location	
		Collar Left		Collar Right				A	B
		Normal	Depressed	Normal	Depressed				
2-Position									
 Roto-Push — Black Flush Button for Vertical Mounting Cat. No. 10250T24111-1	FORWARD/REVERSE; HIGH/LOW; OPEN/CLOSE; UP/DOWN; etc.	O	O	O	X	10250T2411-2	1NO		
	JOG/RUN; MAN./AUTO; etc.	O	X	O	X	10250T24111-2	1NO		
	RUN/JOG; START/JOG; etc.	O	X	O	X	10250T24111-1	1NO		
	SAFE/RUN; etc.	O	O	O	X	10250T2415-2	1NO		

① X = Closed Circuit, O = Open Circuit.

Two-Position Latched

The Two-Position Roto-Push Latch Unit is fully assembled and only requires a legend plate for a great variety of applications. When the selector collar is in the extreme left position, the button is in the free or normal position and can be operated as a standard pushbutton. Rotating the collar to the extreme right position automatically depresses and latches the button in the depressed position. The white filled groove in the button indicates the selector collar position. The selector collar has spring return to the left position except when in the extreme right latched position.

Table 2-232. Rotates to a Latch-Out Mode

Colour and Type of Button	Contact Block	Vertical Mounting
		Catalogue Number
 Red Long	1NC 2NC	10250T72 10250T73

Accessories **Pages 2-154 – 2-155**
 Additional Circuit Arrangements **Pages 2-132 – 2-133**
 Dimensions **Pages 2-159 – 2-161**
 Enclosures **Pages 2-152 – 2-153**
 Legend Plates **Pages 2-150 – 2-151**

10250T Series, Roto-Push Components

Roto-Push Operators

Roto-Push Components

A Roto-Push control unit combines the function of a pushbutton and a selector switch. The contacts are operated by the combined action of rotating the outer collar and pushing a button contained in the collar.

In selecting the cam and contact blocks for the listed function, the analysis involves considering the function with the collar rotated to the given position with the button free (designated as "N") and then in that same position with the button depressed (designated "D"). This is done for each rotational position of the collar.

When Ordering Specify

- Catalogue Number of Operator with Cam Code Suffix from tables below and on following pages, Example: 10250T2411.
- Catalogue Number(s) for Contact Blocks and Legend Plates if required.
- To select the cam and contact blocks needed for 2-position and 3-position switches, use the tables on following pages.



Operator and Cam
10250T2411

Table 2-233. Operator and Cam

Colour and Type of Button	Vertical Mounting	Horizontal Mounting	Cam Code No. Select from Tables	Overall Dimensions in Inches (mm)
	Catalogue and Code Number	Catalogue and Code Number		
Black Flush	10250T241_	10250T251_	+ 1 to 18	
Red Flush ①	10250T242_	10250T252_		
Green Flush	10250T243_	10250T253_		
Black Long	10250T261_	10250T271_		
Red Long ①	10250T262_	10250T272_		
Green Long	10250T263_	10250T273_		

① Not to be used for Emergency Stop application.

Two-Position Roto-Push Operator — Rotates to a Latch-Out Mode



Special Roto Latch
Red Long Button
Catalogue Number
10250T3213

Special Rotor Latch

This differs from the other Roto-Push operators in that as the collar is rotated to the right it depresses the button and releases the button when rotated left. But the button in the released position can be momentarily

pushed independent of the collar or its position. As the button is depressed by rotating the collar, the button also rotates and indicates its mode by a white line on the button face. This button can be used as an emergency stop or latched stop.

Table 2-234. Special Rotor Latch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Colour and Type of Button	Vertical Mounting	Overall Dimensions in Inches (mm)
	Catalogue Number	
Red Long	10250T3213	
Black Long	10250T3214	

Contact Blocks **Page 2-147**
Enclosures **Pages 2-152 – 2-153**
Legend Plates **Pages 2-150 – 2-151**

Roto-Push Operators (Continued)

Table 2-235. Cam and Contact Block Selection for Two-Position Roto-Push

Combination Number	Collar Position		Cam Code 1	Cam Code 2	Cam Code 3	Cam Code 4	Cam Code 5	Cam Code 6
	Circuit Sequence ①							
	N D	N D						
1	O O	O X	A	A	—	—	A	—
2	O O	X O	—	—	—	A NC B	A NC B	—
3	O O	X X	—	—	—	—	B	A
4	O X	O O	B	A NC B	—	—	—	A NC B
5	O X	O X	A NO B NO	B	—	A	—	—
6	O X	X O	—	—	—	—	—	—
7	O X	X X	—	—	A or B NO	B	—	B
8	X O	O O	—	—	A or B NC	B	—	B
9	X O	O X	—	—	—	—	—	—
10	X O	X O	A NC B NC	B	—	A	—	—
11	X O	X X	B	A NO B NC	—	—	—	A NO B NC
12	X X	O O	—	—	—	—	B	A
13	X X	O X	—	—	—	A NO B NC	A NO B NC	—
14	X X	X O	A	A	—	—	A	—

① N = Button in free or normal position. D = Button depressed.

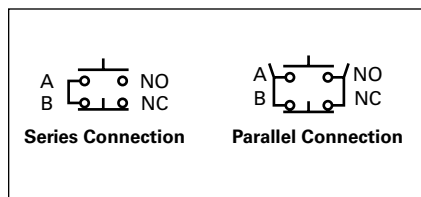


Figure 2-102. Series and Parallel Connections

The connections are not made at the factory. They are illustrated in the selection table as requirements, but must be made on the job.

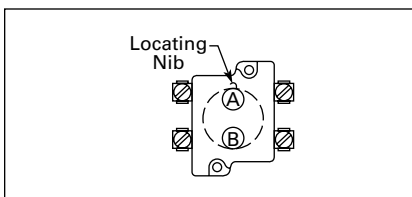


Figure 2-103. Circuit Location

Letters "A" and "B" represent the locations which the two circuits of a contact block will occupy in relation to the locating nib of the operator. Figure 2-102 illustrates this pictorially.

Figure 2-102 illustrates this pictorially.

2

10250T Series, Roto-Push Components

Roto-Push Operators (Continued)

Table 2-235. Cam and Contact Block Selection for Two-Position Roto-Push (Continued)

Combination Number	Collar Position		Cam Code 10	Cam Code 11	Cam Code 12	Cam Code 13	Cam Code 14
	Circuit Sequence ①						
	N D	N D					
15	O O	O X	—		—	—	—
16	O O	X O	—		A	A or B NC	A
17	O O	X X	B	B	—	—	—
18	O X	O O	A		—	—	B
19	O X	O X	—	A	B	—	—
20	O X	X O	—	—	—	—	A
21	O X	X X	A		A	—	—
22	X O	O O	A		A	—	—
23	X O	O X	—	—	—	—	A
24	X O	X O	—	A	B	—	—
25	X O	X X	A		—	—	B
26	X X	O O	B	B	—	—	—
27	X X	O X	—		A	A or B NO	A
28	X X	X O	—	A	—	—	—

① N = Button in free or normal position. D = Button depressed.

2

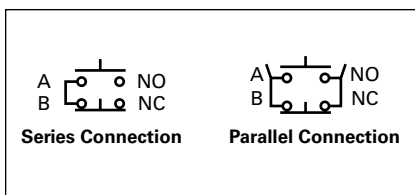


Figure 2-104. Series and Parallel Connections

The connections are not made at the factory. They are illustrated in the selection table as requirements, but must be made on the job.

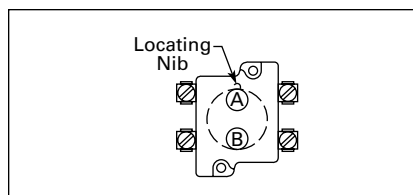


Figure 2-105. Circuit Location

Letters "A" and "B" represent the locations which the two circuits of a contact block will occupy in relation to the locating nib of the operator.

Figure 2-104 illustrates this pictorially.

Roto-Push Operators (Continued)

Table 2-236. Cam and Contact Block Selection for Three-Position Roto-Push

Combination Number	Collar Position			Cam Code 7	Cam Code 8	Cam Code 9 ①	Cam Code 15 ①	Cam Code 16	Cam Code 17	Cam Code 18
	N D	N D	N D							
1	O O	O O	O X			—			—	
2	O O	O O	X X	—	—		—	—		—
3	O O	O X	O O	—	—		—	—	—	
4	O O	O X	O X	—	—	—	—	—	—	
5	O O	O X	X X	—	—		—	—	—	—
6	O O	X X	O O	—		—	—	—	—	—
7	O O	X X	O X	—		—	—	—	—	—
8	O O	X X	X O		—	—	—	—	—	—
9	O O	X X	X X		—	—	—	—	—	—
10	O X	O O	O O			—				
11	O X	O O	O X		—	—			—	—
12	O X	O O	X X	—	—	—	—	—		—
13	O X	O X	O O	—	—	—	—	—	—	
14	O X	O X	O X	—	—	—	—	—	—	
15	O X	X X	O O	—		—	—	—	—	—
16	O X	X X	O X	—		—	—	—	—	—
17	O X	X X	X X		—	—	—	—	—	—

① Limited to 4 contact blocks. See Note on Page 2-147.

② N = Button in free or normal position. D = Button depressed.

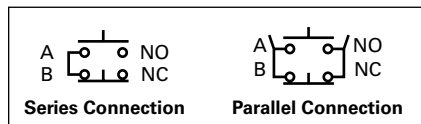


Figure 2-106. Series and Parallel Connections

The connections are not made at the factory. They are illustrated in the selection table as requirements, but must be made on the job.

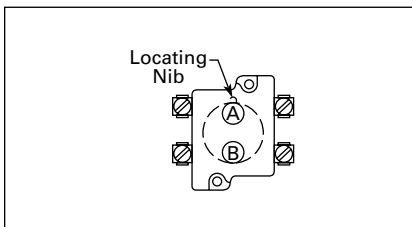


Figure 2-107. Circuit Location

Letters “A” and “B” represent the locations which the two circuits of a contact block will occupy in relation to the locating nib of the operator. **Figure 2-106** illustrates this pictorially.

Contact Blocks **Page 2-147**

10250T Series, Roto-Push Components

Roto-Push Operators (Continued)

Table 2-236. Cam and Contact Block Selection for Three-Position Roto-Push (Continued)

Combination Number	Collar Position			Cam Code 7	Cam Code 8 ^①	Cam Code 9	Cam Code 15	Cam Code 16	Cam Code 17	Cam Code 18
	N	D	N							
18	X	O	O	O	O	O	O	O	O	O
19	X	O	O	X	X					
20	X	O	O	X	O					
21	X	O	X	X	O					
22	X	O	X	X	X					
23	X	O	X	X	O					
24	X	O	X	O	X					
25	X	O	X	O	X					
26	X	X	O	O	O					
27	X	X	O	O	O	X				
28	X	X	O	O	X	O				
29	X	X	O	O	X	X				
30	X	X	X	X	O	O				
31	X	X	X	X	O	X				
32	X	X	X	O	X	O				
33	X	X	X	O	X	X				

① Limited to 4 contact blocks.

② N = Button in free or normal position. D = Button depressed.

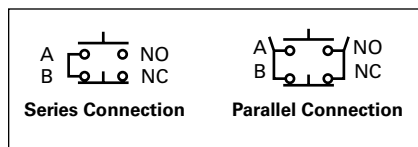


Figure 2-108. Series and Parallel Connection

The connections are not made at the factory. They are illustrated in the selection table as requirements, but must be made on the job.

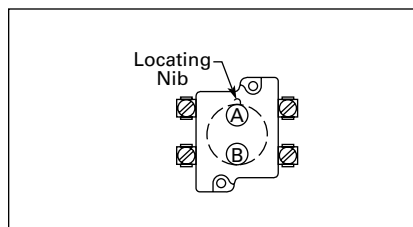


Figure 2-109. Circuit Location

Letters "A" and "B" represent the locations which the two circuits of a contact block will occupy in relation to the locating nib of the operator. Figure 2-108 illustrates this pictorially.

April 2009

10250T Series, Components — Contact Blocks

Contact Blocks

Standard Contact Blocks

- UL A600/P600 rated
- Colour-coded plungers – red/green for NC/NO circuits
- Silver contact tips with “reliability nibs”
- Black (opaque) or amber (translucent) housings
- Pressure plate or spade terminals
- Fingerproof shrouds (for pressure terminals only)

Logic Level Contact Blocks

- UL A600/P600 rated
- Black plungers
- Inert palladium knife-blade contacts
- Black (opaque) housings
- Pressure plate or spade terminals
- Fingerproof shrouds not available

Special Function Contact Blocks

- UL A600/P600 rated
- Black plungers
- Silver contact tips with “reliability nibs”
- Black (opaque) housings
- Pressure plate terminals only
- Fingerproof shrouds not available

Special Purpose Contact Block

- Maximum 300V rated
- Black plungers
- Silver contact tips with “reliability nibs”
- Black (opaque) housings
- Pressure plate terminals only
- Fingerproof shrouds not available

Reliability Nibs

Reliability nibs are the hallmark of Eaton’s Cutler-Hammer contact blocks. A pointed silver nib on the contact tip

ensures reliable switching from logic level (5V) up to 600V applications. Therefore standard contact blocks can be used for most logic level applications where the contacts are not exposed to any harsh environmental conditions.


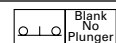
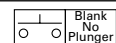
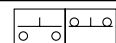
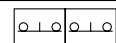
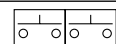
Palladium Contacts

Palladium, which is more inert than gold, is well suited for voltages and currents approaching zero and is recommended for applications where environmental conditions are a factor.

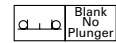
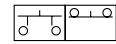
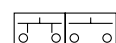
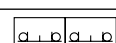
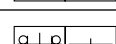
Maximum Contact Block Mounting per Operator Type

Operator	Max. Stack	Operator	Max. Stack
Pushbuttons	6	2- or 3-Position Selector Switches	6
Push-Pull Operators	2	4-Position Selector Switches	4
Roto-Push Operators	4	Joysticks	4

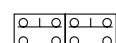
Table 2-237. Contact Blocks

Symbol	Circuit	Description/ Notes ①	Standard		Logic Level		
			Pressure Terminals	Spade Terminals ②	Pressure Terminals	Spade Terminals ②	
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	
							
	1NC	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T51	10250T59	10250T51E	10250T59E	
	1NO	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T53	10250T60	10250T53E	10250T60E	
	NO-NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T1	10250T40	10250T1E	10250T40E	
	2NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T3	10250T42	10250T3E	10250T42E	
	2NO	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T2	10250T41	10250T2E	10250T41E	

Special Function Blocks ③

	LONC	Late opening NC. Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T71 ③	—	10250T71E ③	—
	ECNO-NC	Early closing NO and standard NC. Stack up to 6 blocks unless otherwise noted.	10250T47 ③ ④	—	10250T47E ③	—
	ECNO-NO	Early closing NO and standard NO. Stack up to 4 blocks unless otherwise noted.	10250T57 ③ ④	—	10250T57E ③	—
	2LONC	Two late opening NC contacts. Stack up to 6 blocks unless otherwise noted.	10250T45 ③	—	10250T45E ③	—
	LONC-ECNO	Overlapping contacts. Stack up to 4 blocks unless otherwise noted.	10250T55 ③ ④	—	10250T55E ③	—

Special Purpose Blocks ⑤

	2NO-2NC	Four circuits in single block depth. Rated 300V max. Stack up to 4 blocks unless otherwise noted.	10250T44 ⑤	—		
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① All 10250T contact blocks shown are suitable for use on standard 10250T and E34 operators. These contact blocks are not suitable for Class I Division 2 type 10250T or E34 devices.
 ② Contact blocks with spade terminals are limited to a maximum of one contact block per operator and minimum spacing between devices is 2.5” (63.5 mm). Not suitable for use in 10250T or E34 enclosures. Also available in amber housing. Not available with fingerproof shrouds.

③ Special function contact blocks are not suitable for use with roto-push operators, 3-position push-pull operators, or 4-position selector switches.
 ④ ECNO contact blocks are not suitable for use with 2-position joysticks or when operators are used with padlock attachments.

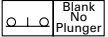

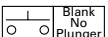
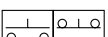
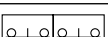
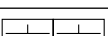
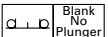
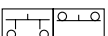
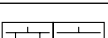
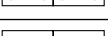
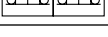
⑤ Special purpose 10250T44 contact blocks are not suitable on selector switches or roto-push operators. Okay to use with 3-position push-pull operators only on low voltage (30V or less) circuits.

Ratings..... Page 2-115
 Dimensions..... Pages 2-159 – 2-161

10250T Series, Components — Contact Blocks

Contact Blocks (Continued)

Table 2-238. Contact Blocks with Fingerproof Shrouds

Symbol	Circuit	Description/ Notes ①	Standard	Logic Level
			Pressure Terminals ②	Pressure Terminals ②
			Catalogue Number	Catalogue Number
	1NC	 10250T1CP		
		Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T51P	10250T51EP
	1NO	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T53P	10250T53EP
	NO-NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T1P	10250T1EP
	2NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T3P	10250T3EP
	2NO	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T2P	10250T2EP
Special Function Blocks ④				
	LONC	Late opening NC. Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T71P ④	10250T71EP ④
	ECNO-NC	Early closing NO and standard NC. Stack up to 6 blocks unless otherwise noted.	10250T47P ④ ⑤	10250T47EP ④
	ECNO-NO	Early closing NO and standard NO. Stack up to 4 blocks unless otherwise noted.	10250T57P ④ ⑤	10250T57EP ④
	2LONC	Two late opening NC contacts. Stack up to 6 blocks unless otherwise noted.	10250T45P ④	10250T45EP ④
	LONC-ECNO	Overlapping contacts. Stack up to 4 blocks unless otherwise noted.	10250T55P ④ ⑤	10250T55EP ④

① All 10250T contact blocks shown are suitable for use on standard 10250T and E34 operators. These contact blocks are not suitable for Class I Division 2 type 10250T or E34 devices.

② To order contact blocks with translucent amber housing, change Suffix P to **CP** in Catalogue Number e.g. 10250T51**CP**.

③ Contact blocks with spade terminals are limited to a maximum of one contact block per operator and minimum spacing between devices is 2.5" (63.5 mm). Not suitable for use in 10250T or E34 enclosures. Also available in amber housing. Not available with fingerproof shrouds.

④ Special function contact blocks are not suitable for use with roto-push operators, 3-position push-pull operators, or 4-position selector switches.

⑤ ECNO contact blocks are not suitable for use with 2-position joysticks or when operators are used with padlock attachments.

Contact Blocks (Continued)

Table 2-239. Amber Contact Blocks

Symbol	Circuit	Description/ Notes ^①	Standard		Logic Level	
			Pressure Terminals ^②	Spade Terminals ^③	Pressure Terminals ^②	Spade Terminals ^③
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
		10250T1CP				
	1NC	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T51C	10250T59C	10250T51EC	10250T59EC
	1NO	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T53C	10250T60C	10250T53EC	10250T60EC
	NO-NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T1C	10250T40C	10250T1EC	10250T40EC
	2NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T3C	10250T42C	10250T3EC	10250T42EC
	2NO	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T2C	10250T41C	10250T2EC	10250T41EC

Special Function Blocks ^③

	LONC	Late opening NC. Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T71C ^④	—	10250T71EC ^④	—
	ECNO-NC	Early closing NO and standard NC. Stack up to 6 blocks unless otherwise noted.	10250T47C ^{④ ⑤}	—	10250T47EC ^④	—
	ECNO-NO	Early closing NO and standard NO. Stack up to 4 blocks unless otherwise noted.	10250T57C ^{④ ⑤}	—	10250T57EC ^④	—
	2LONC	Two late opening NC contacts. Stack up to 6 blocks unless otherwise noted.	10250T45C ^④	—	10250T45EC ^④	—
	LONC-ECNO	Overlapping contacts. Stack up to 4 blocks unless otherwise noted.	10250T55C ^{④ ⑤}	—	10250T55EC ^④	—

Special Purpose Blocks ^⑥

	2NO-2NC	Four circuits in single block depth. Rated 300V max. Stack up to 4 blocks unless otherwise noted.	10250T44C ^⑥	—		
--	---------	---	----------------------------------	---	--	--

^① All 10250T contact blocks shown are suitable for use on standard 10250T and E34 operators. These contact blocks are not suitable for Class I Division 2 type 10250T or E34 devices.

^② To order amber contact blocks with finger-proof shrouds, change Suffix to **CP** in the Catalogue Number e.g. 10250T51**CP**. Not available with spade terminals.

^③ Contact blocks with spade terminals are limited to a maximum of one contact block per operator and minimum spacing between devices is 2.5" (63.5 mm). Not suitable for use in 10250T or E34 enclosures. Also available in amber housing. Not available with fingerproof shrouds.

^④ Special function contact blocks are not suitable for use with roto-push operators, 3-position push-pull operators, or 4-position selector switches.

^⑤ ECNO contact blocks are not suitable for use with 2-position joysticks or when operators are used with padlock attachments.

^⑥ Special purpose 10250T44C contact blocks are not suitable on selector switches or roto-push operators. Okay to use with 3-position push-pull operators only on low voltage (30V or less) circuits.

10250T Series, Legend Plates

Options

Legend Plates

Legend Plates with Standard Markings

The legend plates listed below are sized for all standard commercial enclosures and Eaton's Cutler-Hammer cast enclosures. For vertical spacing less than 1.75", replace the S in the Catalogue Number with MS, or the M with P (except Push-Pull). No change in price. The smaller size legend plates, "MS" or "P" size, have limited space for legend.

Table 2-240. For Pushbutton Operators and Indicating Lights Standard

Legend	Colour of Field	Catalogue Number	
		Square ⑥	1/2 Round
Blank		See Table 2-246 on Page 2-151	

Letters on Legend Plates Below are 3/16" High

CLAMP	Black	10250TS90	10250TM90
CLOSE	Black	10250TS73	10250TM11
DOWN	Black	10250TS74	10250TM12
EMERG. STOP	Red	10250TS13	10250TM13
FAST	Black	10250TS75	10250TM14
FASTER	Black	10250TS87	10250TM87
FEEDER ON	Black	10250TS94	10250TM94
FEEDER OFF	Black	10250TS95	10250TM95
FORWARD	Black	10250TS15	10250TM15
HIGH	Black	10250TS16	10250TM16
IN	Black	10250TS17	10250TM17
INCH	Black	10250TS18	10250TM18
JOG	Black	10250TS19	10250TM19
JOG FOR.	Black	10250TS20	10250TM20
JOG REV.	Black	10250TS21	10250TM21
LOW	Black	10250TS22	10250TM22
LOWER	Black	10250TS23	10250TM23
LUBE-FAIL	Black	10250TS92	10250TM92
MOTOR RUN	Black	10250TS81	10250TM81
MOTOR STOP	Black	10250TS82	10250TM82
OFF	Red	10250TS24	10250TM24
ON	Black	10250TS25	10250TM25
OPEN	Black	10250TS26	10250TM26
OUT	Black	10250TS27	10250TM27
POWER ON	Black	10250TS80	10250TM80
RAISE	Black	10250TS28	10250TM28
READY	Black	10250TS86	10250TM86
RESET	Black	10250TS29	10250TM29
REVERSE	Black	10250TS30	10250TM30
RUN	Black	10250TS31	10250TM31
SAFE	Black	10250TS85	10250TM85
SLOW	Black	10250TS32	10250TM32
SLOWER	Black	10250TS88	10250TM88
START	Black	10250TS33	10250TM33
STOP	Red	10250TS34	10250TM34
TEST	Black	10250TS83	10250TM83
TRANSFER	Black	10250TS93	10250TM93
TRIP	Black	10250TS84	10250TM84
UNCLAMP	Black	10250TS91	10250TM91
UP	Black	10250TS35	10250TM35

① Square legend plates have a satin aluminum field. Colour is on lower portion.

Table 2-241. Blank Plastic Legend Plates — Square

Colour		Catalogue Number		
Lettering	Field	Standard	Jumbo ③	Extra Large
Black	White or Silver ②	10250TSP76	10250TLP76	10250TEP76
White	Red or Black ②	10250TSP77	10250TLP77	10250TEP77

② If legend plate is to be engraved, specify field colour required.

③ Cannot be used on cast enclosures except for top row. Suitable for most sheet metal enclosures.



Square Legend Plate
Catalogue Number
10250TS41



1/2 Round Legend Plate
Catalogue Number



70 mm Round Plastic
Catalogue Number
10250TRP79

Table 2-242. For Selector Switch and Roto-Push Operators Standard Size

Legend	Colour of Field	Catalogue Number	
		Square ④	1/2 Round
Blank		See Table 2-246 on Page 2-151	

2-Position — 5/32" High Lettering

FOR. REV.	Black	10250TS38	10250TM38
HAND AUTO	Black	10250TS39	10250TM39
HIGH LOW	Black	10250TS40	10250TM40
JOG RUN	Black	10250TS41	10250TM41
MAN. AUTO	Black	10250TS67	10250TM67
OFF ON	Black	10250TS42	10250TM42
OPEN CLOSE	Black	10250TS43	10250TM43
RUN JOG	Black	10250TS44	10250TM44
SAFE RUN	Black	10250TS45	10250TM45
START JOG	Black	10250TS46	10250TM46
START STOP	Black	10250TS47	10250TM47
UP DOWN	Black	10250TS48	10250TM48

3-Position — 1/8" High Lettering

AUTO OFF HAND	Black	10250TS49	10250TM49
FOR. OFF REV.	Black	10250TS50	10250TM50
FOR. SAFE REV.	Black	10250TS69	10250TM69
HAND OFF AUTO	Black	10250TS51	10250TM51
MAN. OFF AUTO	Black	10250TS68	10250TM68
OPEN OFF CLOSE	Black	10250TS53	10250TM53
RUN SAFE JOG	Black	10250TS70	10250TM70
UP OFF DOWN	Black	10250TS54	10250TM54
ON STOP SAFE	Red	10250TS71	10250TM71

④ Square legend plates have a satin aluminum field. Colour is on lower portion.

Table 2-243. 45 mm and 70 mm Plastic — Round

Colour	Field	Catalogue Number
Lettering		
45 mm		
Blank	Yellow or Red ⑤	10250TRP78
70 mm		
Blank	Yellow or Red ⑤	10250TRP76
Red EMERG. STOP	Yellow	10250TRP79

⑤ If legend plate is to be engraved, specify field colour required.

Table 2-244. For Push-Pull Units ⑥

Legend	Colour of Field	Catalogue Number	
		Square ⑦	1/2 Round

Standard Size — Letters on Legend Plates Below are 3/32" High

PULL START/PUSH STOP	Green/Red	10250TPP2	10250TR2
PUSH ON/PULL OFF	Black	10250TPP5	10250TR5
PULL OPEN/PUSH CLOSE	Black	10250TPP8	10250TR8
PULL UP/PUSH DOWN	Black	10250TPP11	10250TR11

Jumbo Size — Letters on Legend Plates Below are 1/8" High

PULL START/PUSH STOP	Green/Red	10250TPP3	10250TR3
PULL ON/PUSH OFF	Black	10250TPP6	10250TR6
PULL OPEN/PUSH CLOSE	Black	10250TPP9	10250TR9
PULL UP/PUSH DOWN	Black	10250TPP12	10250TR12

⑥ All Push-Pull Legend Plates include the symbols ↑↓ in the centre of the plate.

⑦ Square legend plates have a satin aluminum field. Colour is on lower portion.

10250T Series, Legend Plates

Legend Plates with Non-standard Markings

When Ordering Specify

- Catalogue Number of Blank Plate Phase plus Suffix "STAMP"
- Insert the following into Order Notes: Legend, Letter Size and Locations (letters A - W) — combine letters for definitive locations as shown.

Ordering Example:

Catalogue No.: 10250TS36STAMP
Letter Size: 3/32 inch (2.4 mm)
Pos. A — POWER HOUSE
Pos. B — START PUMP 1

Legend Characters Available

ABCDEFGHIJKLMN OPQRSTUVWXYZ
YZ/.,1234567890

Legend characters on black and red plates are white — on satin aluminum plates, characters are black.

Blackening Kit

Solution blackens aluminum exposed by engraving process. Must be applied immediately after engraving. 0.3 oz. bottle — sufficient for approximately 1100 legend plates.

Table 2-245. Blackening Kit

Catalogue Number
10250TBK

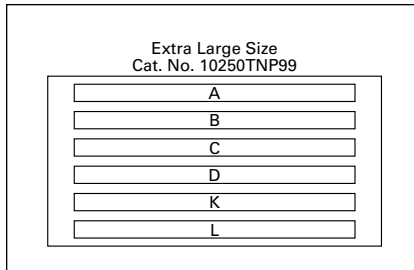


Figure 2-110. Legend Positions

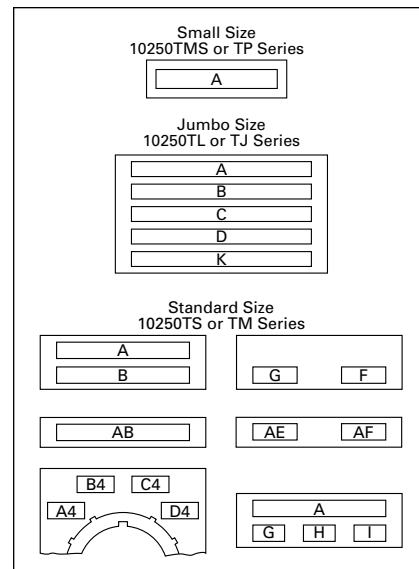


Figure 2-111. Legend Positions

Table 2-246. Blank and Custom Engraved Legend Plates

Style	Colour	Small	Standard	Jumbo ③	Extra Large ②	4-Position Selector Switch		Push-Pull with Symbols ①	
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Custom ⑤	Standard	Standard	Jumbo ③
Square ④	Black	10250TMS36	10250TS36	10250TL36	—	10250TS76	10250TS72	10250TPP17	10250TPP18
	Red	10250TMS37	10250TS37	10250TL37	—	—	—	—	—
	Green/Red Satin Alum.	—	—	—	10250TNP99	—	—	10250TPP20	10250TPP21
1/2 Round	Black	10250TP36	10250TM36	10250TJ36	—	—	10250TM72	10250TR17	10250TR18
	Red	10250TP37	10250TM37	10250TJ37	—	—	—	10250TR20	10250TR21
	Green/Red Satin Alum.	—	10250TM89	10250TJ89	—	—	—	—	—

- ① All Push-Pull Legend Plates include the symbols ↑↓ in the centre of the plate.
- ② When used to meet Ford Motor Co. specifications, specify engraved legend. Cannot be used on standard cast or sheet metal enclosures.
- ③ Cannot be used on cast enclosures except for top row. Suitable for most sheet metal enclosures.
- ④ Square legend plates have a satin aluminum field. Colour is on lower portion.
- ⑤ Slightly larger than standard size for legends requiring more space — fits cast enclosures.

Table 2-247. Maximum Characters per Legend Plate and Approximate Dimensions

Top (Aluminum and Plastic)	Approximate Dimensions in Inches (mm)		Style	Character Size					
	Width	Height		3/32" High		1/8" High		3/16" High	
				Number of Lines	Number of Characters	Number of Lines	Number of Characters	Number of Lines	Number of Characters
Small ⑥	1.59 (40.4)	1.59 (40.4)	Square 1/2 Round	1 1	17 15	— 1	— 12	— 1	— 9
Standard and Custom	1.75 (44.5)	1.75 (44.5)	Square	2	18	2	13	1	9
			1/2 Round	2	15	2	12	1	9
Jumbo ⑦	2.19 (55.6)	2.19 (55.6)	Square	5	23	3	18	2	12
			1/2 Round	5	19	4	15	2	11
Extra Large ⑧	2.44 (62)	2.44 (62)	Square	6	25	3	18	3	12

- ⑥ Recommended only when mounting on minimum centres [less than 1-3/4 inch (44.5 mm) vertical centres].
- ⑦ Can be used on top row only of any enclosure.
- ⑧ When used to meet Ford Motor Co. specifications, specify engraved legend. Cannot be used on standard cast or sheet metal enclosures.




Legend Plates for
Joystick Operator Page 2-140
Commande d'étiquettes Page A-2

10250T Series, Enclosures

Enclosures

Die Cast, Polyester and Stainless Steel Enclosures

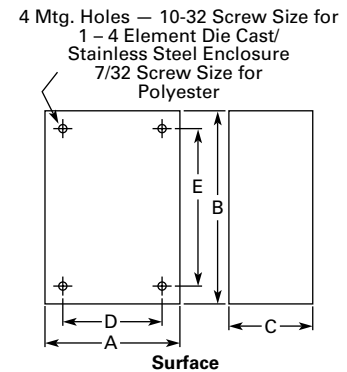
Table 2-248. Enclosures (Case and Cover) — Surface Mounting ①

	Number of Elements	1 Contact Block Depth		2 Contact Block Depth	
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
 Die Cast Enclosure Cat. No. 10250TN11	Cast Enclosure — In-Line ②③⑤ NEMA 4, 4X, 12, 13				
	1	10250TN1	10250TN11	10250TN12	10250TN13
	2	10250TN2	10250TN11	10250TN12	10250TN13
	3	10250TN3	10250TN11	10250TN12	10250TN13
	4	10250TN4	10250TN11	10250TN12	10250TN13
 Polyester Enclosure Cat. No. E34N52	Polyester ⑤ — In-Line NEMA 3, 4X, 12				
	1	—	—	E34N51	E34N52
	2	—	—	E34N53	E34N54
	3	—	—	E34N53	E34N54
	4	—	—	E34N53	E34N54
 Stainless Steel Enclosure Cat. No. 10250TN35	Stainless Steel ④⑤ — In-Line NEMA 4, 4X, 12				
	1	—	—	10250TN33	10250TN34
	2	—	—	10250TN33	10250TN34
	3	—	—	10250TN35	10250TN36
	4	—	—	10250TN35	10250TN36

- ① For spacing increments, see Page 2-153.
- ② All cast enclosures can be converted to base mounting of contact blocks, with spacers 10250TA22 or 10250TA23. See listing on Page 2-155.
- ③ When used with E30 pushbuttons, only the one element enclosure can be used.
- ④ 14 gauge, type 304.
- ⑤ When used with resistor light units, only the 2 contact block depth enclosure can be used.

Table 2-249. Approximate Dimensions

Number of Elements	Element Arrangement	Surface Mounting					Conduit Entrance	Approximate Dimensions
		Dimensions in Inches (mm)						
		Wide A	High B	Deep C	Mounting			
					D	E		
Cast								
1	In-Line	3.88 (98.6)	4.0 (101.6)	3.0 (76.3) ⑦	2.69 (68.3)	3.25 (82.6)	3/4	
2	In-Line	3.88 (98.6)	5.88 (149.4)	3.0 (76.3) ⑦	2.69 (68.3)	5.13 (130.3)	3/4	
3	In-Line	3.88 (98.6)	7.75 (196.9)	3.0 (76.3) ⑦	2.69 (68.3)	7.0 (177.8)	1	
4	In-Line	3.88 (98.6)	9.63 (244.6)	3.0 (76.3) ⑦	2.69 (68.3)	8.88 (225.6)	1	
Polyester								
1	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	⑥	
2	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	⑥	
3	In-Line	3.81 (96.8)	8.88 (225.6)	3.38 (85.9)	2.94 (74.7)	7.13 (181.1)	⑥	
4	In-Line	3.81 (96.8)	11.13 (282.7)	3.38 (85.9)	2.94 (74.7)	9.38 (238.3)	⑥	
Stainless Steel								
1	In-Line	3.00 (76.2)	3.50 (88.9)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)	⑥	
2	In-Line	3.50 (88.9)	6.75 (171.5)	3.00 (76.2)	1.50 (38.1)	7.50 (190.5)	⑥	
3	In-Line	3.50 (88.9)	9.00 (228.6)	3.00 (76.2)	1.50 (38.1)	9.00 (228.6)	⑥	
4	In-Line	3.50 (88.9)	11.25 (285.8)	3.00 (76.2)	1.50 (38.1)	12.00 (304.8)	⑥	



- ⑥ No conduit entrance holes provided. Drill as required.
- ⑦ Depth given is for two contact block deep stations. One contact block deep stations subtract 3/4 inch (19.1 mm).

Note: 2-position joystick must be used with two contact block deep enclosures (maximum number of contact blocks = 1). 4-position joysticks can not be used within these enclosures.



One Contact Block Depth Enclosure



Two Contact Block Depth Enclosure

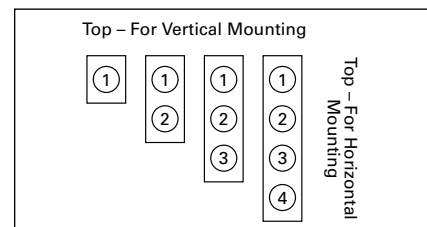



Figure 2-112. Enclosure Layouts

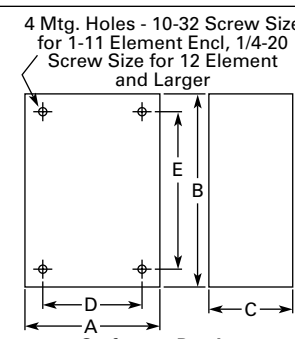
Die Cast and Stainless Steel — Flush Mount, Covers Only

Table 2-250. Covers Only — Flush Mounting

	Number of Elements	Catalogue Number	Catalogue Number
	Flush Cast Covers		
		In-Line Deep Cover	In-Line Flat Cover
	1	10250TF11	10250TF1
	2	10250TF12	10250TF2
	3	10250TF13	10250TF3
	4	10250TF14	10250TF4
		In-Line Stainless Steel Flush Plates ①	
		With Pullbox	Without Pullbox
	1	10250TS10	10250TS1
	2	10250TS11	10250TS2
3	10250TS12	10250TS3	
4	10250TS14	10250TS4	

① Not oiltight. NEMA 1 applications only.

Table 2-251. Approximate Dimensions

Number of Elements	Flush Mounting					Approximate Dimensions
	Dimensions in Inches (mm)					
	Wide A	High B	Deep C	Mounting		
				D	E	
Cast						
1	3.88 (98.6)	4.0 (101.6)	0.25 (6.4) ②	3.50 (88.9)	3.63 (92.2)	
2	3.88 (98.6)	5.88 (149.4)	0.25 (6.4) ②	3.50 (88.9)	5.50 (139.7)	
3	3.88 (98.6)	7.75 (196.9)	0.25 (6.4) ②	3.50 (88.9)	6.0 (152.4)	
4	3.88 (98.6)	9.63 (244.6)	0.25 (6.4) ②	3.50 (88.9)	9.25 (235)	
Stainless Steel						
1	5.0 (127)	5.0 (127)	2.50 (63.5) ③	3.25 (82.6)	1.88 (47.8)	
2	5.0 (127)	6.88 (174.8)	2.50 (63.5) ③	3.25 (82.6)	3.63 (92.2)	
3	5.0 (127)	8.63 (219.2)	2.50 (63.5) ③	3.25 (82.6)	5.50 (139.7)	
4	5.0 (127)	10.50 (266.7)	2.50 (63.5) ③	3.25 (82.6)	7.25 (184.2)	

② Depth given is for flat cover. Deep cover 3/4 inch (19.1 mm) deeper.

③ Depth given includes pull box.

Table 2-252. Spacing Increments

Type	Approximate Dimensions in Inches (mm)		
	F	G	H
Cast	2.44 (62)	2.5 (63.5)	1.88 (47.8)
Polyester	1.88 (47.8)	Min. 2.13 (54.1)	2.25 (57.2)
Stainless Steel	1.69 (42.9)	Min. 1.73 (43.9)	2.25 (57.2)

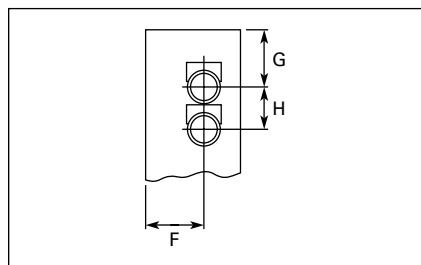


Figure 2-113. Spacing Increments for Enclosures

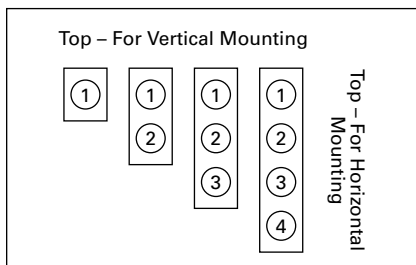















Figure 2-114. Enclosure Arrangement Diagram









10250T Series, Accessories

Accessories

Padlocks not included with padlocking attachments. For operators with built-in padlock attachment, see **Page 2-119**.

Table 2-253. Accessories









	Description	Catalogue Number
Padlock Attachments		
	Padlocking Attachment for Flush Pushbutton Operators Permits locking NC contacts in open position with 1/4" padlock. Will not lock NO contact.	10250TA2
	Padlocking Attachment for Use with Extended Pushbutton Permits locking NC contacts in open position with 1/4" padlock.	10250TA26
	Padlocking Cover Guard Cover locked over flush button makes it unaccessible or on extended button locks NC contacts open. Takes 1/4" shank size padlock.	10250TA36
	Padlock Hasp or Flip-Up Guard When used with a 1/4" padlock, makes flush and long button and knob selector switch unaccessible, but not locked down. Without the padlock, it is a flip-up guard. Padlock hasp can be removed before assembly.	10250TA38
	Padlocking Attachment for Use with Flexible Weather Resistant Boot Used on long button operators. Stainless steel. Use only for locking NC contacts open.	10250TA63
	Padlock Attachment For use with Illuminated Push-buttons and maintained Push-Pull operators having standard button or lens only. Use 1/4" padlock. Locks in down position only.	10250TA64
	Padlocking Attachment for Non-illuminated Knob Selector Switches Provision for up to 5, 1/4" padlocks.	10250TA11
Shrouds and Guards		
	Shroud for Mushroom Head Operator Prevents accidental operation. (Not for push-pull operators.)	10250TA6
	Extended Retaining Nut Replaces standard nut and provides guard for flush head push-button operators.	10250TA12
	Guard for Illuminated Pushbutton	10250TA15
	Shroud For jumbo mushroom head operator. Grey Yellow	10250TA56 10250TA56Y
	Half Shroud - Yellow For jumbo mushroom head operator.	10250ED1241
	Fingerproof Shroud - 10 per Package Fits new style contact blocks and light units.	10250TA101











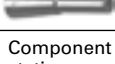
	Description	Catalogue Number
Boots		
	Flexible Weather Resistant Boot For use with button operators (extended buttons preferred). Temperature to -25°F (-32°C) Black Red Green (See Page 2-155 for 10250TA96 Tightening Tool.)	10250TA3 10250TA4 ① 10250TA10
	Transparent Boot For regular illuminated pushbutton operators and PresTest — Temperature to -38°F (-39°C) ②	10250TA25
	Boot for Flush Pushbutton Clear Black Red Green	10250TA46 10250TA47 10250TA48 10250TA49
Hardware and Kits		
	Thrust Washers To meet Ford Motor Co. mounting specifications.	10250TK3
NEED PHOTO	Contact Block Tape Seal Seals plunger openings on last contact block. Order in multiples of 10 pieces.	10250TK5
	Special Retaining Nut To accommodate thick panel: Indicating lights PresTest, pushbuttons and selector switches	10250TA30 10250TA31
	Terminal Block Two terminals, each will accommodate two wire terminations.	10250TA62
	Spacer Ring Used when legend plate is not required.	10250TA8
	Stacking Screw Replaces transformer mounting screws on indicating light so terminal block 10250TA62 can be mounted to light to support and connect a series resistor. This screw also fits all contact blocks. Order in multiples of 10.	10250TA79

① Should not be used on flush button for STOP function.
 ② Not suitable for single contact block depth cast enclosure. Cover is too thick.

Dimensions **Pages 2-159 – 2-161**

Table 2-253. Accessories (Continued)

Description	Catalogue Number	
Hardware and Kits (Continued)		
 Base Mounting Spacers ^① Equivalent to contact block in depth Complete with screws, washers, etc.	1 Block Deep 10250TA22	
	2 Block Deep 10250TA23	
 Grounding Kits Kits consist of a ring connector and a #6 screw for mounting connector to rear of contact block mounting screw. All components except Standard Indicating Lights and PresTest Indicating Lights Standard Indicating Lights PresTest Indicating Lights	10250TKG1	
	10250TKG2 ^②	
	10250TKG3 ^②	
 Contact Block Terminal Jumpers Available in multiples of 100 only. Term. to Term. within Block (short) 100 per pkg. 1000 per pkg. Term. to Term. Block to Block (long) 100 per pkg. 1000 per pkg.	10250TA70 10250TA70-2	
	10250TA71 10250TA71-2	
	Special Operators and Attachments	
	 Wobble Stick Complete with retaining nut fits standard button.	10250TA5
 Lever Operator For use with two vertically mounted flush pushbuttons.	10250TA14	
 Maintained Contact Attachment Release Button Assembly ^② Mechanically interlocks with another pushbutton and contact block (not included). Provides mode indication. Minimum hole centres 1.62 inch (41.1 mm), maximum 2.313 inch (58.8 mm). Black Red Green Yellow Same with Long Button — Black	10250TA17 10250TA18 10250TA19 10250TA20 10250TA39	
 Maintained Contact Attachment ^② Mechanically interlocks two buttons and provides position indication for one. Use with two pushbutton operators and one or more contact blocks.	10250TA1	
 Roto-Push Lever Operator Used to provide lever operation for Roto-Push operators.	10250TA13	

Description	Catalogue Number
Special Light Modules	
 Master Test (Dual Input) Module Internal Form C relay suitable for either AC or DC applications. Total electrical isolation between monitored and test circuit. Fits all illuminated 10250T, E22, E30 and E34 devices. 24V AC 120V AC 24V DC 48V DC	10250TMT2 10250TMT1 10250TMT7 10250TMT8
 Flasher Module Changes any AC illuminated device to a controlled flashing light. Fits 10250T, E30 and E34 devices. 24V 120V	10250TFL2 10250TFL1
 Flashing Incandescent Lamp For use with 120V transformer type or 6V full voltage type Indicating Lights including PresTest and most E29 devices.	10250ED986-4
Hole Plugs	
 Plug For unused holes Steel, painted grey (Stainless steel, use E30KT5, see Page 2-110)	10250TA7
Tools	
 Octagonal 10250T (notched to fit over selector switch lever), E29 and E30	10250TA95
 E22, E30, E34 and Octagonal 10250T (will not fit over selector switch levers)	E22CW
 Tool for Tightening Boots Used to install boot Catalogue Numbers, 10250TA3, A4, A10 and A25.	10250TA96
 10250T, E34 Allen Wrench Used for removal of jumbo mushroom head.	10250TA102
 Lamp Removal Tools For transformer type illuminated pushbuttons, push-pull and selector switches. Fits #12 lamp.	10250TA74
 For full voltage and resistor type illuminated pushbuttons, push-pull and selector switches and E30.	E30KV1
 Standard indicating lights. Fits #44, #755, #6S6 and #10S6.	E29KLT

① Component only. Not to be used for custom built (factory assembled) stations.

② Not suitable for single contact block depth cast enclosure. Cover is too thick.


10250T/E34 Series, Renewal Parts

Renewal Parts

Table 2-254. Replacement Lamps — For 10250T Illuminated Operators

Mfg. Lamp Type	Voltage	Base Style	Application	Part Number
120MB	120V	T 3-1/4 Bayonet	10250T Resistor Indicating Light	28-3044
#267	6.3V	T 3-1/4 Bayonet	10250T Flasher	10250ED986-4 28-2202 28-5184 28-5185
#755	6.3V	T 3-1/4 Bayonet	10250T Transformer, PresTest and Full Voltage	
#756	12V	T 3-1/4 Bayonet	10250T Full Voltage	
#757	24V	T 3-1/4 Bayonet	10250T Full Voltage	
#1828	32V	T 3-1/4 Bayonet	10250T Full Voltage	28-5186 28-5187 28-494 28-3754 28-3755
#1835	55V	T 3-1/4 Bayonet	10250T Resistor	
NE48	120V	T 4-1/2 Bayonet	10250T Neon	
NE51H-R22	120V	T 3-1/4 Bayonet	10250T Neon	
NE51H-R68	240V	T 3-1/4 Bayonet	10250T Neon	

Table 2-255. Replacement LED Lamps — For 10250T, E34 and E22 Units

	Voltage	Colour	Continuous	Flashing	
			AC/DC	AC	DC
			Catalogue Number	Catalogue Number	Catalogue Number
 <p>Standard LED Lamp</p>	6V – 12V	Red	E22LED612RN	E22LED006RAF	E22LED006RDF
		Orange	E22LED612ON	E22LED006OAF	E22LED006ODF
		Yellow	E22LED612YN	E22LED006YAF	E22LED006YDF
		Green	E22LED612GN	E22LED006GAF	E22LED006GDF
		Blue	E22LED612BN	E22LED006BAF	E22LED006BDF
		White	E22LED612WN	E22LED006WAF	E22LED006WDF
	24V	Red	E22LED024RN	E22LED024RAF	E22LED024RDF
		Orange	E22LED024ON	E22LED024OAF	E22LED024ODF
		Yellow	E22LED024YN	E22LED024YAF	E22LED024YDF
		Green	E22LED024GN	E22LED024GAF	E22LED024GDF
		Blue	E22LED024BN	E22LED024BAF	E22LED024BDF
		White	E22LED024WN	E22LED024WAF	E22LED024WDF
	48V	Red	E22LED048RN	E22LED048RAF	E22LED048RDF
		Orange	E22LED048ON	E22LED048OAF	E22LED048ODF
		Yellow	E22LED048YN	E22LED048YAF	E22LED048YDF
		Green	E22LED048GN	E22LED048GAF	E22LED048GDF
		Blue	E22LED048BN	E22LED048BAF	E22LED048BDF
		White	E22LED048WN	E22LED048WAF	E22LED048WDF
	60V	Red	E22LED060RN	E22LED060RAF	E22LED060RDF
		Orange	E22LED060ON	E22LED060OAF	E22LED060ODF
Yellow		E22LED060YN	E22LED060YAF	E22LED060YDF	
Green		E22LED060GN	E22LED060GAF	E22LED060GDF	
Blue		E22LED060BN	E22LED060BAF	E22LED060BDF	
White		E22LED060WN	E22LED060WAF	E22LED060WDF	
120V	Red	E22LED120RN	E22LED120RAF	E22LED120RDF	
	Orange	E22LED120ON	E22LED120OAF	E22LED120ODF	
	Yellow	E22LED120YN	E22LED120YAF	E22LED120YDF	
	Green	E22LED120GN	E22LED120GAF	E22LED120GDF	
	Blue	E22LED120BN	E22LED120BAF	E22LED120BDF	
	White	E22LED120WN	E22LED120WAF	E22LED120WDF	

April 2009

10250T Series, Renewal Parts



2-Position Joystick Operator



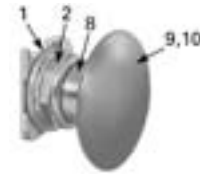
Flush Head Pushbutton Operator



Mushroom Head Pushbutton Operator



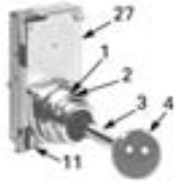
Mushroom Head Operator with Padlock Attachment



Jumbo Mushroom Head Operator



Knob-Operated Selector Switch Operator



4-Position Joystick Operator (w/o Latch)



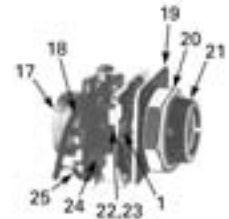
Illuminated Pushbutton Operator



Full Voltage, Resistor and Transformer Type Illuminated Selector Switch



Transformer Type Indicating Light



Potentiometers

Table 2-256. 10250T Style Operator Renewal Parts

Item No.	Description	No. Req.	Part Number
1	Gasket	1	16-1548
2	Mounting Nut	1	15-1530
3	Handle	1	24-5045
4	Knob Knob (Not Shown) for Joystick Operator with Latch	1 1	53-3157 53-3159
5	Common Gate (Supplied with Operator)	2	16-3400
6	Set Screw (#6-32 x 0.250" Long Hollow Hex)	2	11-2014
7	Mushroom Head Button (Includes (2) Item 6) Black Red Yellow Green Blue	1 — — — —	As Req. Below 53-1317 53-1317-2 53-1317-3 53-1317-4 53-1317-22
8	Set Screw (#10-32 x 0.250" Long Hollow Hex)	2	11-544
9	Jumbo Mushroom Head Button (Aluminum — Includes (2) Item 8) Red Black Yellow Green	1 — — — —	As Req. Below 53-1317-9 53-1317-10 53-1317-11 53-1317-12
10	Jumbo Mushroom Head Button (Aluminum — Red EMERG. STOP) Does Not Include Item (8)	1	53-1349-18
11	Position Gate: 2 Position 3 Position 4 Position 8 Position	1 1 1 1	54-7278 54-7173 54-12278 54-12279
12	Mounting Screw (#6-32 x 0.710" Long) Washer	2 2	10250TA79 16-2038
13	Terminal Screw and Lug (Captive)	Req.	80-5502
14	Gasket (Supplied with Basic Unit)	1	32-803

Item No.	Description	No. Req.	Part Number
15	Round Head Screw (#4-40 x 0.344" Long) (Supplied with Basic Unit)	2	11-4553
16	Mounting Screw	2	11-1632
17	Simple Potentiometer (Does Not Include Items 18, 28 or 29) 1,000 Ohms 2,500 Ohms 5,000 Ohms 10,000 Ohms 25,000 Ohms 50,000 Ohms	1 — — — — —	As Req. Below 41-782-2 41-782-3 41-782-10 41-782-4 41-782-5 41-782-6
18	Connector (Includes Screw and Lug)	2	25-1851
19	Indicating Plate Standard Size (Without Legend) Large Size (Specify Legend)	1 — —	As Req. Above 30-4460 10250TR30
20	Retaining Nut	1	15-1547
21	Knob Socket Set Screw (#6-32 x 0.250" Long)	1 1	53-1314 11-2014
22	Coupling	1	29-3749-2
23	Set Screw (#6-32 x 0.188" Long)	1	11-1199
24	Spacer	2	56-1066-18
25	Connector (Includes Screw and Lug)	1	25-1851-2
26	Mounting Nut	1	15-1938
27	4-Position Joystick Operating Mechanism (Complete)	1	24-6565
28	(Not Shown) 4-Position Joystick Operating Mechanism (With Latch) Complete	1	24-6565-2
29	Spring Loaded Latch	1	52-1214-2
30	Hand Operated Latch	1	52-913-3

① Contact the Customer Support Centre at 1-800-268-3578 for list prices.



Mounting

Panel Thickness

- Minimum: 0.06 inch (1.6 mm)
- Maximum: 0.25 inch (8 mm) including legend plate
- Maximum can be increased to 0.375 inch (15.9 mm) using optional retaining nut
 - Indicating light: 10250TA30
 - Pushbutton/selector switch: 10250TA31

Table 2-257. Mounting Matrix

Legend Plate	Dimensions in Inches (mm)			
	A	B	C	D
Small	1.63 (41.3)	2.25 (57.2)	2.25 (57.2)	1.63 (41.3)
Medium	1.75 (44.5)	2.25 (57.2)	2.25 (57.2)	1.75 (44.5)
Large	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)

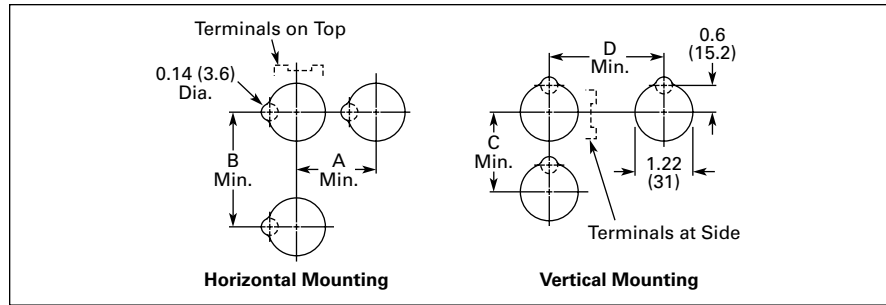


Figure 2-115. Mounting Options in Inches (mm)

Horizontal mounting means terminals are located top and bottom of contact block. Vertical mounting means terminals are left and right of contact block. This allows close spacing of adjacent operators with easy access to terminals.

Note: Locating nib hole or notch is 0.14 inch (3.6 mm) #29 drill.

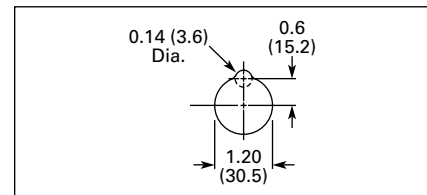


Figure 2-116. Drilling Dimensions in Inches (mm)

Dimensions

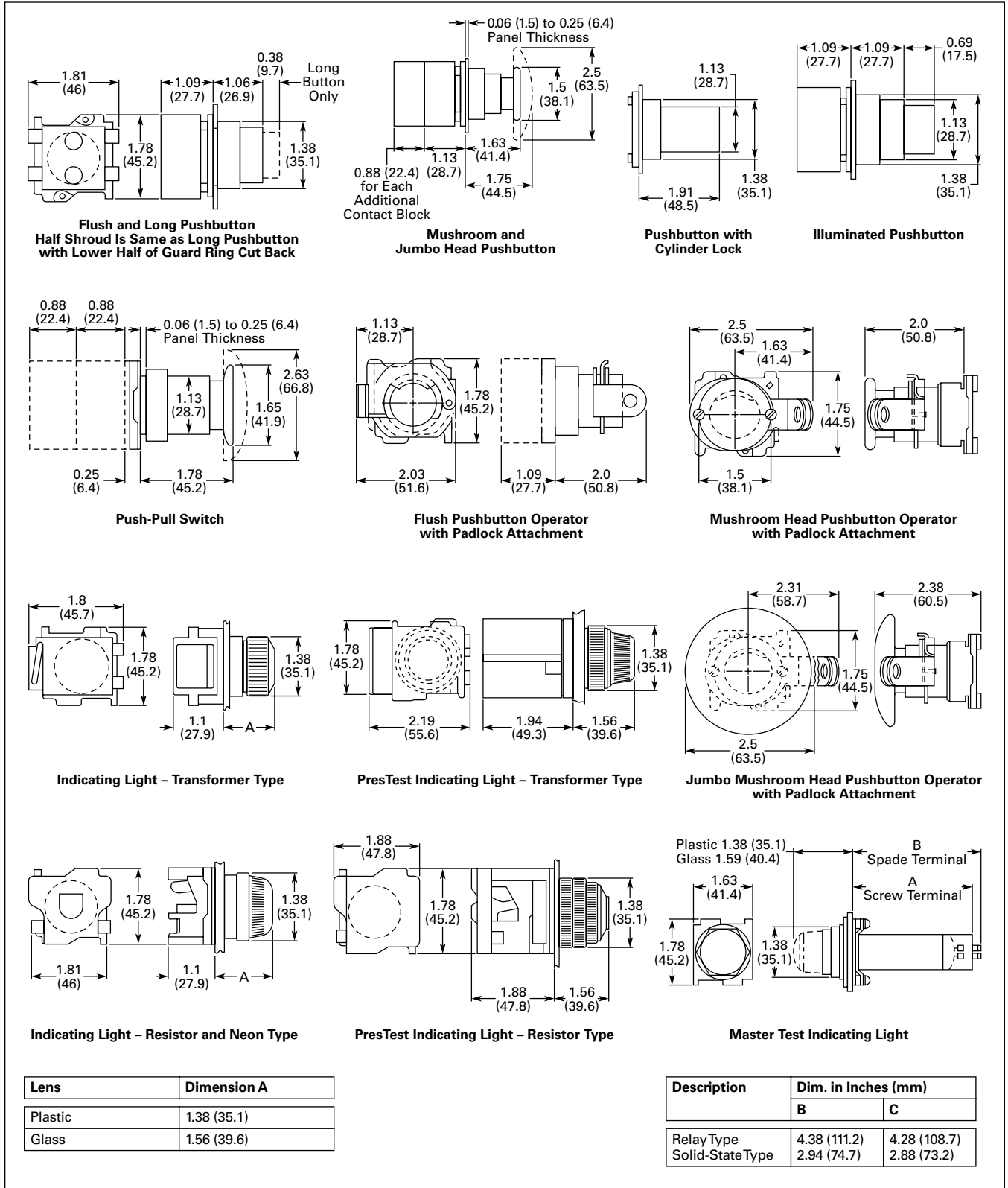


Figure 2-117. Approximate Dimensions in Inches (mm)



10250T Series, Dimensions

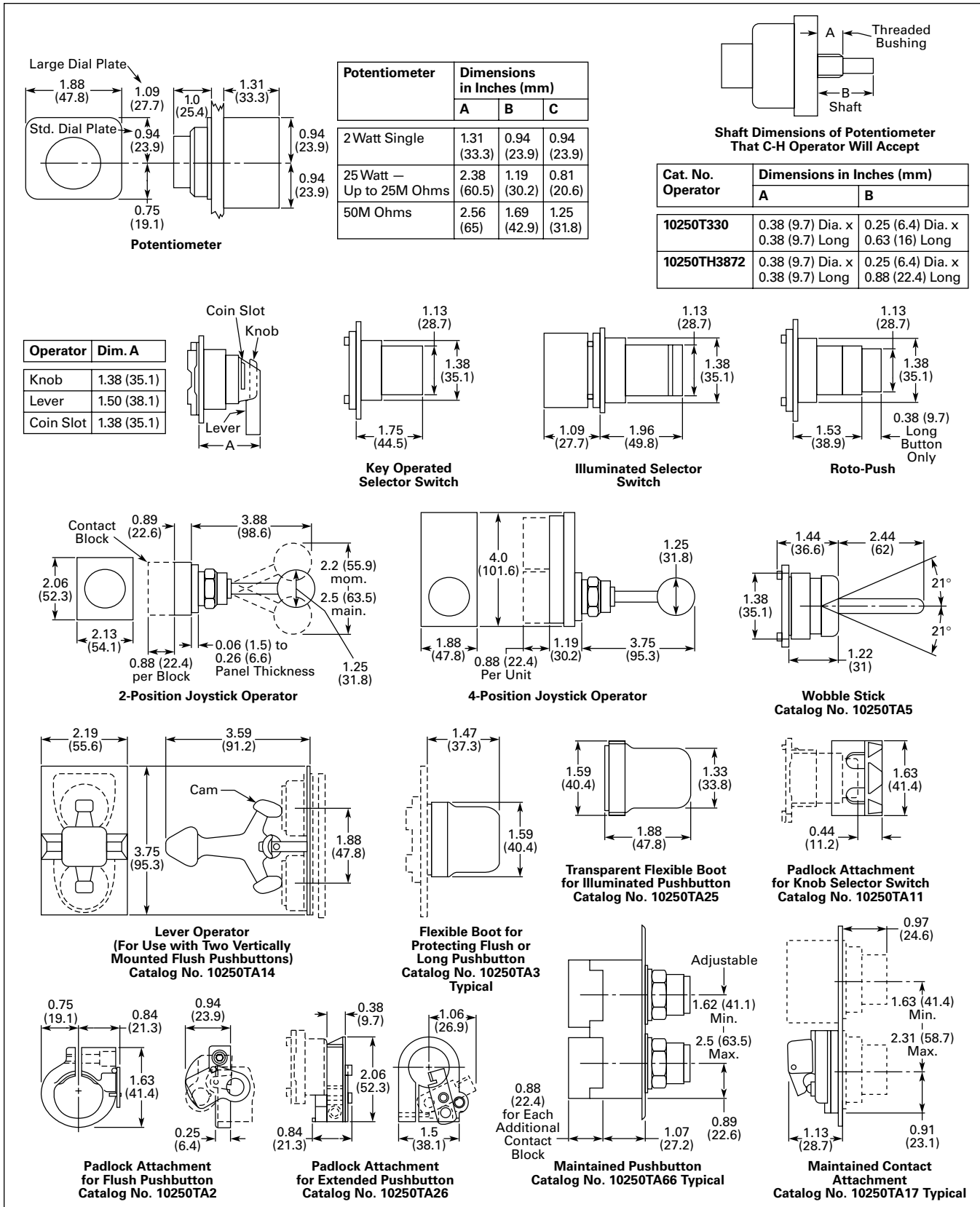


Figure 2-118. Approximate Dimensions in Inches (mm)

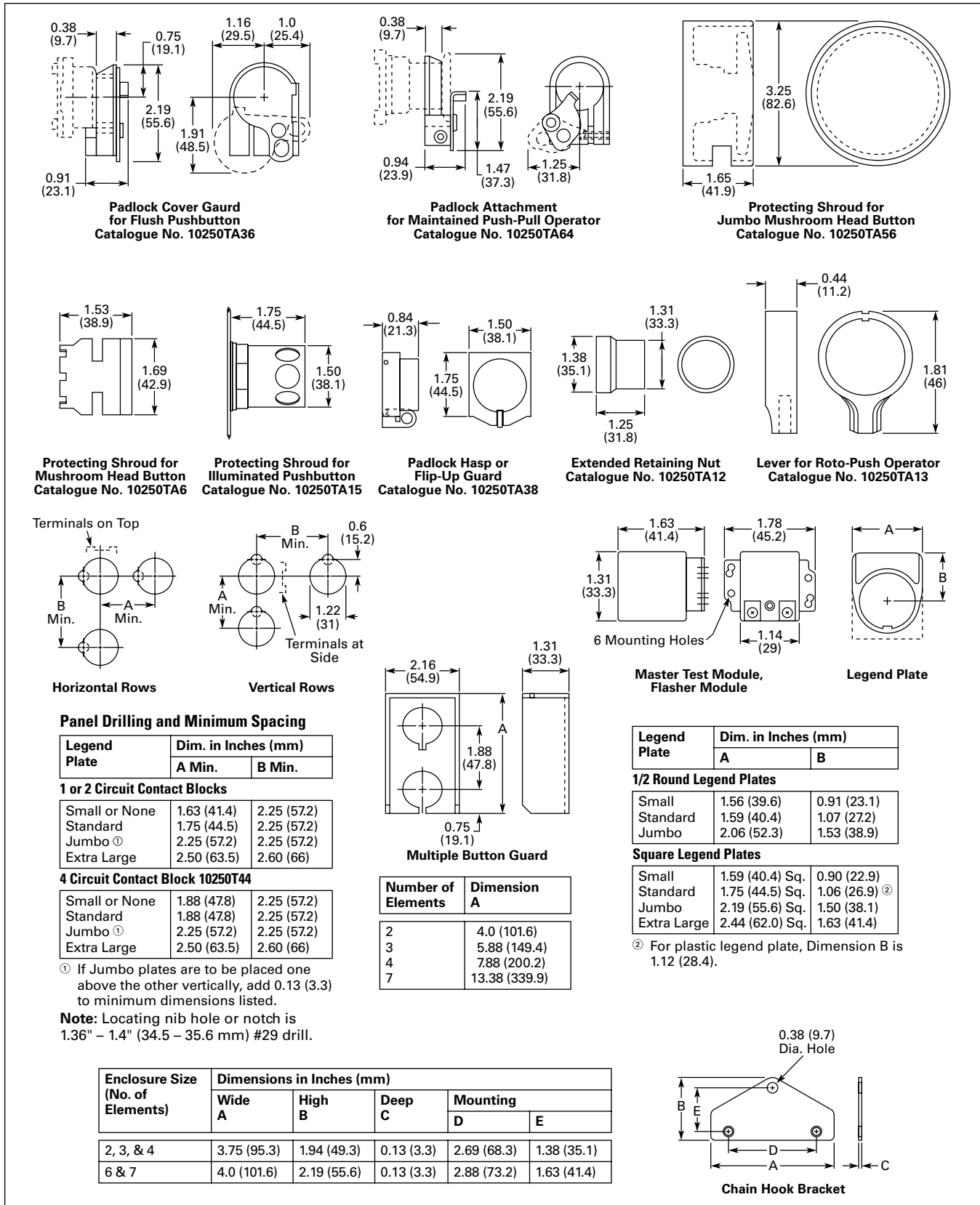
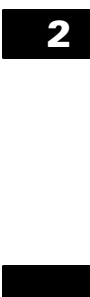


Figure 2-119. Approximate Dimensions in Inches (mm)



10250T Series, Ordering Example

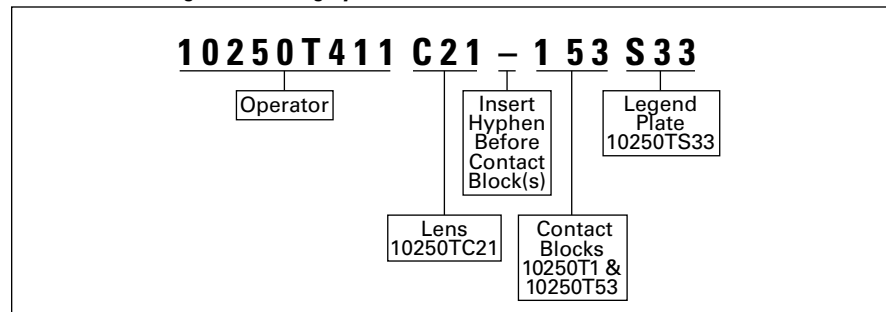
Ordering Complete Devices

Complete 10250T Pushbuttons, Indicating Lights and/or Selector Switch operators including contact block(s) and legend plate can be ordered using a single composite catalogue number. The individually packaged components will be shipped unassembled in a single overpack carton marked with the composite Catalogue Number. Construct Catalogue Number as follows.

Ordering Example

Example: Illuminated Pushbutton Device — Catalogue Number 10250T411C21-153S33

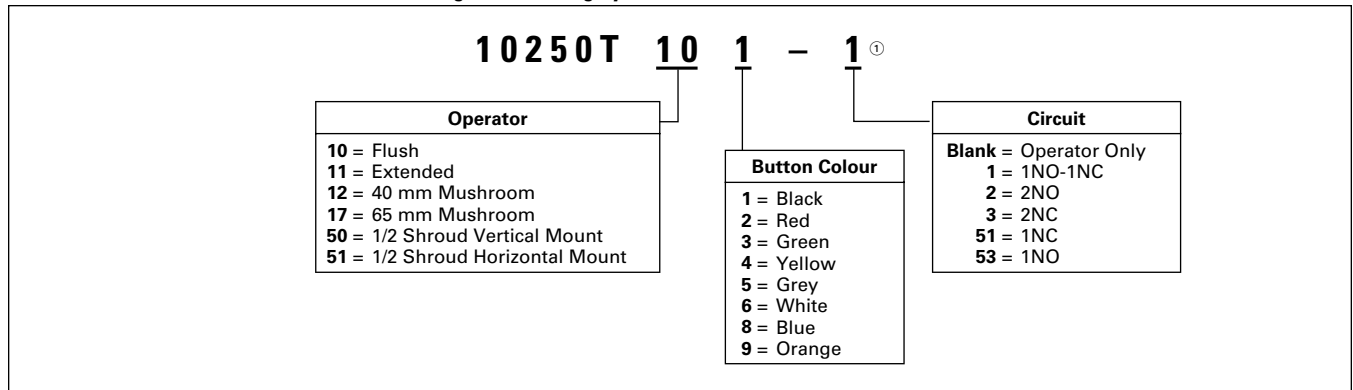
Table 2-258. Catalogue Numbering System



For a complete Catalogue Number breakdown, see **Pages 2-163 – 2-164**.

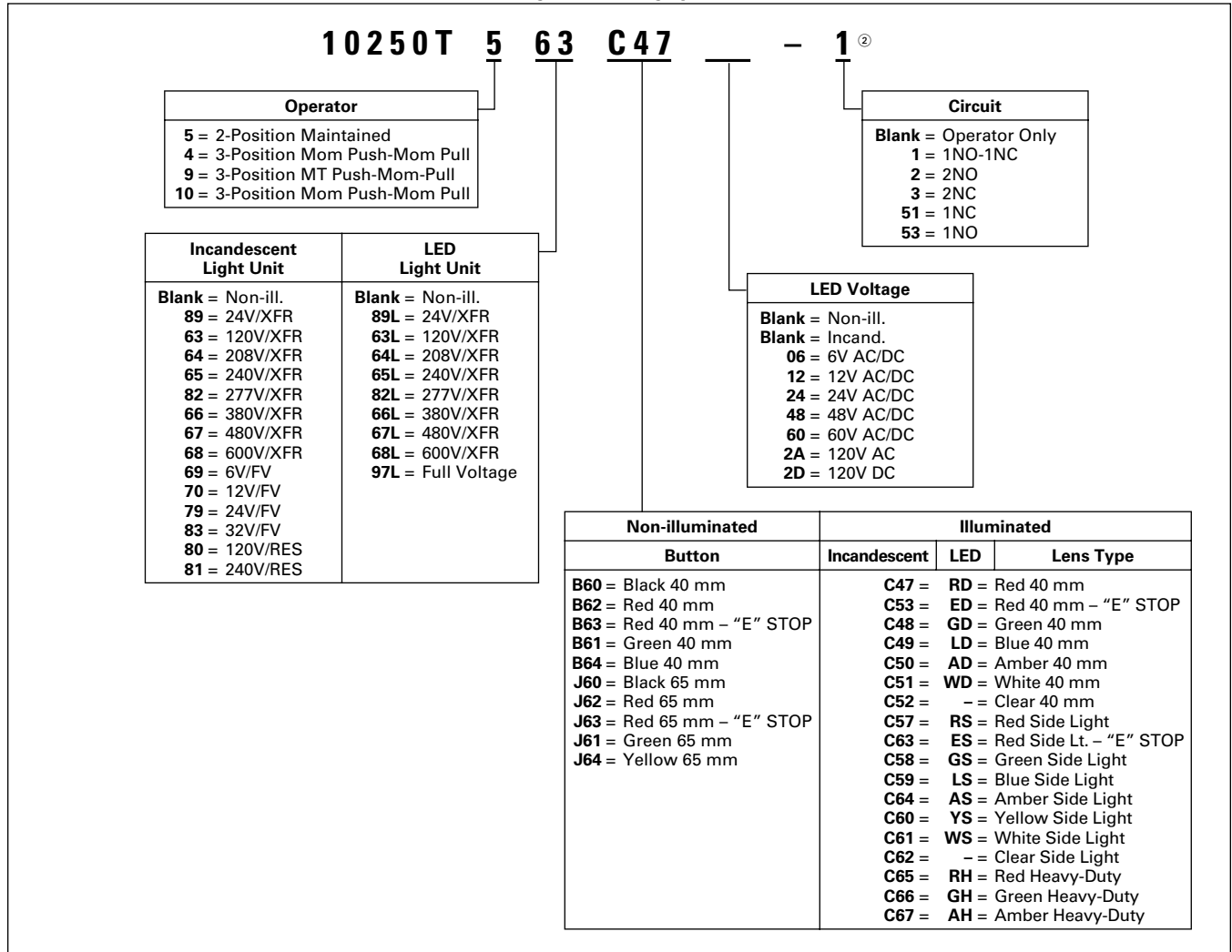
Catalogue Number Structure

Table 2-259. Non-illuminated Pushbuttons Catalogue Numbering System



① Add X at end of Catalogue Number to receive parts assembled from factory.

Table 2-260. Illuminated and Non-illuminated Push-Pulls Catalogue Numbering System



② Add X at end of Catalogue Number to receive parts assembled from factory.

10250T Series, Catalogue Number Structure

Table 2-261. Illuminated Pushbuttons Catalogue Numbering System

1 0 2 5 0 T		4 1 6		C 2 1		-	1 ^①						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Incandescent Light Unit</th> </tr> <tr> <td>416 = 24V/XFR 412 = 120V/XFR 412 = 240V/XFR 419 = 277V/XFR 413 = 380V/XFR 414 = 480V/XFR 415 = 600V/XFR 473 = 6V/FV 474 = 12V/FV 476 = 24V/FV 477 = 32V/FV 478 = 48V/FV 471 = 120V/RES 472 = 240V/RES</td> </tr> </table>	Incandescent Light Unit	416 = 24V/XFR 412 = 120V/XFR 412 = 240V/XFR 419 = 277V/XFR 413 = 380V/XFR 414 = 480V/XFR 415 = 600V/XFR 473 = 6V/FV 474 = 12V/FV 476 = 24V/FV 477 = 32V/FV 478 = 48V/FV 471 = 120V/RES 472 = 240V/RES	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">LED Light Unit</th> </tr> <tr> <td>416L = 24V/XFR 411L = 120V/XFR 412L = 240V/XFR 419L = 277V/XFR 413L = 380V/XFR 414L = 480V/XFR 415L = 600V/XFR 497L = Full Voltage</td> </tr> </table>	LED Light Unit	416L = 24V/XFR 411L = 120V/XFR 412L = 240V/XFR 419L = 277V/XFR 413L = 380V/XFR 414L = 480V/XFR 415L = 600V/XFR 497L = Full Voltage	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Incandescent Lens Colour</th> <th style="text-align: left;">LED Lens Colour</th> </tr> <tr> <td>C21 = Red C22 = Green C23 = Yellow C26 = White C24 = Blue C43 = Amber C25 = Clear</td> <td>RD = Red GD = Green YD = Yellow WD = White LD = Blue AD = Amber</td> </tr> </table>	Incandescent Lens Colour	LED Lens Colour	C21 = Red C22 = Green C23 = Yellow C26 = White C24 = Blue C43 = Amber C25 = Clear	RD = Red GD = Green YD = Yellow WD = White LD = Blue AD = Amber	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Circuit</th> </tr> <tr> <td>Blank = Operator Only 1 = 1NO-1NC 2 = 2NO 3 = 2NC 51 = 1NC 53 = 1NO</td> </tr> </table>	Circuit	Blank = Operator Only 1 = 1NO-1NC 2 = 2NO 3 = 2NC 51 = 1NC 53 = 1NO
Incandescent Light Unit													
416 = 24V/XFR 412 = 120V/XFR 412 = 240V/XFR 419 = 277V/XFR 413 = 380V/XFR 414 = 480V/XFR 415 = 600V/XFR 473 = 6V/FV 474 = 12V/FV 476 = 24V/FV 477 = 32V/FV 478 = 48V/FV 471 = 120V/RES 472 = 240V/RES													
LED Light Unit													
416L = 24V/XFR 411L = 120V/XFR 412L = 240V/XFR 419L = 277V/XFR 413L = 380V/XFR 414L = 480V/XFR 415L = 600V/XFR 497L = Full Voltage													
Incandescent Lens Colour	LED Lens Colour												
C21 = Red C22 = Green C23 = Yellow C26 = White C24 = Blue C43 = Amber C25 = Clear	RD = Red GD = Green YD = Yellow WD = White LD = Blue AD = Amber												
Circuit													
Blank = Operator Only 1 = 1NO-1NC 2 = 2NO 3 = 2NC 51 = 1NC 53 = 1NO													
				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">LED Voltage</th> </tr> <tr> <td>Blank = Incand. 06 = 6V AC/DC 12 = 12V AC/DC 24 = 24V AC/DC 48 = 48V AC/DC 60 = 60V AC/DC 2A = 120V AC 2D = 120V DC</td> </tr> </table>				LED Voltage	Blank = Incand. 06 = 6V AC/DC 12 = 12V AC/DC 24 = 24V AC/DC 48 = 48V AC/DC 60 = 60V AC/DC 2A = 120V AC 2D = 120V DC				
LED Voltage													
Blank = Incand. 06 = 6V AC/DC 12 = 12V AC/DC 24 = 24V AC/DC 48 = 48V AC/DC 60 = 60V AC/DC 2A = 120V AC 2D = 120V DC													

① Add X at end of Catalogue Number to receive parts assembled from factory.

2

Table 2-262. Standard Indicating Lights, PresTest and Master Test Catalogue Numbering System

1 0 2 5 0 T		2 0 3 N		C 1 N		-	②																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: left;">Light Unit Type</th> </tr> <tr> <th style="text-align: left;">Standard – Incandescent</th> <th style="text-align: left;">Standard – LED</th> </tr> <tr> <td>181N = 120V/XFR 182N = 240V/XFR 198N = 277V/XFR 183N = 380V/XFR 184N = 480V/XFR 185N = 600V/XFR 203N = 6V/FV 204N = 12V/FV 206N = 24V/FV 207N = 32V/FV 208N = 48V/FV 201N = 120V/RES 202N = 240V/RES 226N = 120V/Neon 227N = 240V/Neon</td> <td>181L = 120V/XFR 182L = 240V/XFR 198L = 277V/XFR 183L = 380V/XFR 184L = 480V/XFR 185L = 600V/XFR 197L = Full Voltage</td> </tr> <tr> <th style="text-align: left;">PresTest – Incandescent</th> <th style="text-align: left;">PresTest – LED</th> </tr> <tr> <td>221N = 120V/XFR 222N = 240V/XFR 223N = 380V/XFR 224N = 480V/XFR 225N = 600V/XFR 232N = 6V/FV 233N = 12V/FV 235N = 24V/FV 238N = 32V/FV 239N = 48V/FV 231N = 120V/RES 240N = 240V/RES</td> <td>221L = 120V/XFR 222L = 240V/XFR 223L = 380V/XFR 224L = 480V/XFR 225L = 600V/XFR 297L = Full Voltage</td> </tr> <tr> <th style="text-align: left;">Master Test – Incandescent</th> <td></td> </tr> <tr> <td>187N = 120V/XFR 189N = 240V AC – SS</td> <td></td> </tr> </table>				Light Unit Type		Standard – Incandescent	Standard – LED	181N = 120V/XFR 182N = 240V/XFR 198N = 277V/XFR 183N = 380V/XFR 184N = 480V/XFR 185N = 600V/XFR 203N = 6V/FV 204N = 12V/FV 206N = 24V/FV 207N = 32V/FV 208N = 48V/FV 201N = 120V/RES 202N = 240V/RES 226N = 120V/Neon 227N = 240V/Neon	181L = 120V/XFR 182L = 240V/XFR 198L = 277V/XFR 183L = 380V/XFR 184L = 480V/XFR 185L = 600V/XFR 197L = Full Voltage	PresTest – Incandescent	PresTest – LED	221N = 120V/XFR 222N = 240V/XFR 223N = 380V/XFR 224N = 480V/XFR 225N = 600V/XFR 232N = 6V/FV 233N = 12V/FV 235N = 24V/FV 238N = 32V/FV 239N = 48V/FV 231N = 120V/RES 240N = 240V/RES	221L = 120V/XFR 222L = 240V/XFR 223L = 380V/XFR 224L = 480V/XFR 225L = 600V/XFR 297L = Full Voltage	Master Test – Incandescent		187N = 120V/XFR 189N = 240V AC – SS		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: left;">LED Voltage</th> </tr> <tr> <td colspan="6">Blank = Incand.</td> </tr> <tr> <td colspan="6">06 = 6V AC/DC 12 = 12V AC/DC 24 = 24V AC/DC 48 = 48V AC/DC 60 = 60V AC/DC 2A = 120V AC 2D = 120V DC</td> </tr> </table>				LED Voltage						Blank = Incand.						06 = 6V AC/DC 12 = 12V AC/DC 24 = 24V AC/DC 48 = 48V AC/DC 60 = 60V AC/DC 2A = 120V AC 2D = 120V DC					
Light Unit Type																																							
Standard – Incandescent	Standard – LED																																						
181N = 120V/XFR 182N = 240V/XFR 198N = 277V/XFR 183N = 380V/XFR 184N = 480V/XFR 185N = 600V/XFR 203N = 6V/FV 204N = 12V/FV 206N = 24V/FV 207N = 32V/FV 208N = 48V/FV 201N = 120V/RES 202N = 240V/RES 226N = 120V/Neon 227N = 240V/Neon	181L = 120V/XFR 182L = 240V/XFR 198L = 277V/XFR 183L = 380V/XFR 184L = 480V/XFR 185L = 600V/XFR 197L = Full Voltage																																						
PresTest – Incandescent	PresTest – LED																																						
221N = 120V/XFR 222N = 240V/XFR 223N = 380V/XFR 224N = 480V/XFR 225N = 600V/XFR 232N = 6V/FV 233N = 12V/FV 235N = 24V/FV 238N = 32V/FV 239N = 48V/FV 231N = 120V/RES 240N = 240V/RES	221L = 120V/XFR 222L = 240V/XFR 223L = 380V/XFR 224L = 480V/XFR 225L = 600V/XFR 297L = Full Voltage																																						
Master Test – Incandescent																																							
187N = 120V/XFR 189N = 240V AC – SS																																							
LED Voltage																																							
Blank = Incand.																																							
06 = 6V AC/DC 12 = 12V AC/DC 24 = 24V AC/DC 48 = 48V AC/DC 60 = 60V AC/DC 2A = 120V AC 2D = 120V DC																																							
				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Plastic</th> <th>Glass</th> <th>Lens Colour</th> <th>Plastic</th> <th>Glass</th> <th>Lens Colour</th> </tr> <tr> <th colspan="3" style="text-align: left;">Standard/Master – Incandescent</th> <th colspan="3" style="text-align: left;">Standard/Master/PresTest – LED</th> </tr> <tr> <td>C1N = C2N = C3N = C6N = C4N = C19N = C5N =</td> <td>C7N = Red C8N = Green - = Yellow C12N = White C10N = Blue C9N = Amber C11N = Clear</td> <td></td> <td>RP = GP = YP = WP = LP = AP =</td> <td>RG = Red GG = Green - = Yellow WG = White LG = Blue AG = Amber</td> <td></td> </tr> <tr> <th colspan="6" style="text-align: left;">PresTest – Incandescent</th> </tr> <tr> <td>C21 = C22 = C23 = C26 = C24 = C43 = C25 =</td> <td>C13N = Red C14N = Green - = Yellow C18N = White C16N = Blue C15N = Amber C17N = Clear</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Plastic	Glass	Lens Colour	Plastic	Glass	Lens Colour	Standard/Master – Incandescent			Standard/Master/PresTest – LED			C1N = C2N = C3N = C6N = C4N = C19N = C5N =	C7N = Red C8N = Green - = Yellow C12N = White C10N = Blue C9N = Amber C11N = Clear		RP = GP = YP = WP = LP = AP =	RG = Red GG = Green - = Yellow WG = White LG = Blue AG = Amber		PresTest – Incandescent						C21 = C22 = C23 = C26 = C24 = C43 = C25 =	C13N = Red C14N = Green - = Yellow C18N = White C16N = Blue C15N = Amber C17N = Clear						
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② Add X at end of Catalogue Number to receive parts assembled from factory.

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Product Description

Operator

Eaton's Cutler-Hammer® E34 Series 30.5 mm pushbutton line features the same rugged die cast construction of our 10250T line with an additional two-layer 100% solid thermosetting cathodic epoxy coating. This coating provides a flat black smooth, consistent, corrosion resistant surface that has passed a demanding 600 hour salt spray test. (The industry standard for this 4X test requires only 200 hours.)

Ultraviolet Light

E34 cathodic coating is not recommended for use in applications where exposure to ultraviolet light exists — use NEMA 4X 10250T operators.

Reliability Nibs

Eaton's Cutler-Hammer contact blocks feature enclosed silver contacts with pointed "reliability nibs" for reliable performance from logic level up to 600V. To ensure reliable switching, nibs bite through oxide which can form on silver contacts, eliminating the need for expensive logic level blocks for most applications.

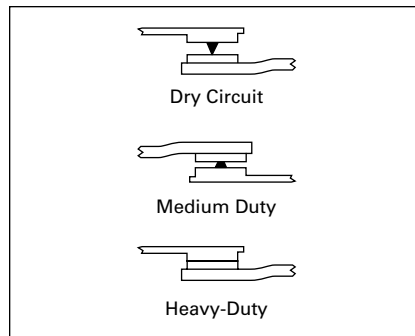


Figure 2-120. Reliability Nibs

Liquid Drainage

Eaton's Cutler-Hammer pushbutton operators offer front of panel drainage via holes in the operator bushing. Hidden from view by the mounting nut, these holes prevent buildup of liquid inside the operator, which can prevent operation in freezing environments. The holes also provide a route for escaping liquid in high pressure wash-downs, effectively relieving pressure from the internal diaphragm seal, ensuring reliable sealing in applications even beyond NEMA 4.

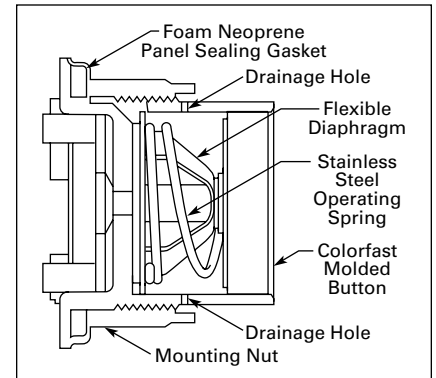
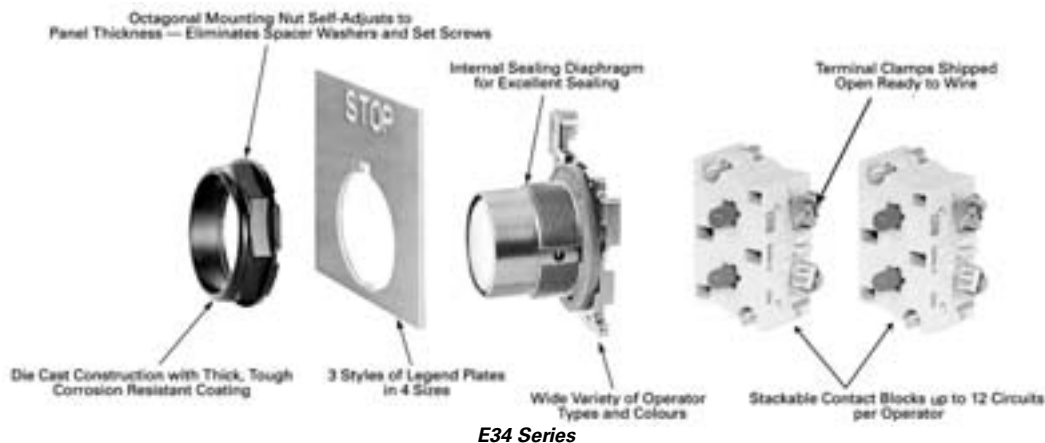


Figure 2-121. Diaphragm Seal

Features

- Epoxy-coated metal operators
- Corrosion resistant
- Integral ground screw terminal on operators
- FDA approved for sanitary chemical resistance requirements



Standards and Certifications

- CE EN60947-5-1
- UL 508 — File No. E131568
- CSA C22.2 No. 14 — File No. LR68551
- FDA 3-A Sanitary Standards

Ingress Protection

When mounted in similarly rated enclosure —

- Standard Indicating Lights
 - UL (NEMA) 1, 2, 3, 3R, 3S, 4, 4X, 12, 13
 - IEC IP65
- All Other Operators
 - UL (NEMA) 1, 2, 3, 3R, 4, 4X, 12, 13
 - IEC IP65

Technical Data and Specifications

Mechanical Ratings

- Frequency of operation
 - All pushbuttons: 6000 operations/hr.
 - Key and lever selector switches: 3000 operations/hr.
 - Auto-latch devices: 1200 operations/hr.
- Life
 - Pushbuttons: 10×10^6 operations
 - Contact blocks: 10×10^6 operations
 - PresTest units: 10×10^6 operations
 - Lever and key selector switches: 0.25×10^6 operations
 - Twist to release pushbuttons: 0.3×10^6 operations
- Shock resistance
 - Duration: 210 mS \geq 5g

Climate Conditions

- Operating Temperature: 1° to 150°F (-17° to 66°C)
- Storage Temperature: -40° to 176°F (-40° to 80°C)
- Altitude: 6,562 ft. (2,000m)
- Humidity: Max. 95% RH @ 60°C

Electrical Ratings

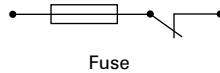
Table 2-266. Contact Block

Meet or Exceed NEMA Rating Designations A600, A300 and B300 for AC and P600 for DC							
Description	Volts AC 50 or 60 Hz				Volts DC		
	120	240	480	600	24/28	125	250
Make and Emergency Interrupting Capacity (Amp)	60	30	15	12	5.7	1.1	0.55
Normal Load Break (Amp)	6	3	1.5	1.2	5.7	1.1	0.55
Thermal Current (Amp)	10	10	10	10	5.0	5.0	5.0
Voltamperes:							
Make and Emergency Interrupting Capacity	7200	7200	7200	7200	138	138	138
Normal Load Break	720	720	720	720	138	138	138

- Insulation: $U_i = 660V$ AC or DC
- Thermal: $I_{th} = 10A$

Short Circuit Coordination to IEC/EN 60947-5-1

- Rated conditional short circuit current: 1 kA
- Fuse type: GE Power Controls TIA 10, Red Spot Type gG, 10A, 660V AC, 460V DC, BS88-2, IEC 60269-2-1



- NEMA, UL rating: A600, P600
 - AC load life duty cycle 1200 operations/hour
 - 10A: 110V pf 0.4 – 1×10^6 operations
 - 5A: 250V pf 0.4 – 1×10^6 operations
 - 2A: 660V pf 0.4 – 1×10^6 operations
- Switching capacity
 - AC15 rated make/break ($11 \times I_e$ at $1.1 \times U_e$)
 - 6A: 120V pf 0.3
 - 4A: 240V pf 0.3
 - 2A: 660V pf 0.3
 - DC13 rated make/break ($1.1 \times I_e$ at $1.1 \times U_e$)
 - 1.0A: 125V L/R ≥ 0.95 at 300 mS
 - 0.55A: 250V L/R ≥ 0.95 at 300 mS
 - 0.1A: 660V L/R ≥ 0.95 at 300 mS
 - 10A: 110V pure resistive
- Maximum ratings for logic level and hostile atmosphere application
 - Maximum amperes: 0.5A
 - Maximum volts: 120V AC/DC

- Low voltage switching: Conical shaped points or “reliability nibs” improve performance in dry circuit, corrosive, fine dust and other contaminated atmospheres. Under normal environmental conditions, the minimum operational voltage is 5V and the minimum operational current is 1 mA, AC/DC.
- Contact operation: Slow make and break. All normally closed contacts have positive opening operation, i.e., normally closed contacts are forced open in the event of contact weld or spring breakage.

Light Units

- Transformers: will withstand short circuit for 1 hour per IEC 60947-5-1
- Bulbs — average life:
 - Transformer type: 20,000 hrs.
 - Resistor/direct voltage type: 2500 hrs. minimum @ rated V
 - LED: 60,000 to 100,000 hrs.

Note: For additional technical information, see Pub. TD.74.TE.04.

Terminals

- Marking: NC-NO on the contact block to meet the NEMA requirements. Dual marking system 1 – 2 for normally closed, 3 – 4 for normally open to meet BS5472 (Cenelec EN50 005).
- Clamps: Terminals are saddle clamp type for 1 x 22 AWG (0.34 mm²) to 2 x 14 AWG (2.5 mm²) conductors.
- Torque = 7 lb-in (0.8 Nm)
- Degree of protection against direct electrical contact: IP2X with finger-proof shroud

April 2009





E34 Series, Assembled Devices — Momentary Pushbutton and Indicating Light Units

Product Selection

Momentary Pushbutton Units

- Non-illuminated

Table 2-267. Pushbutton Units — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Contact Type	Button Colour	Flush Button	Extended Button	Mushroom Button	Jumbo Mushroom ①
					
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
1NO	Black Red Green Red — Engraved EMERG. STOP	E34PB1-53X E34PB2-53X E34PB3-53X —	E34EB1-53X E34EB2-53X E34EB3-53X —	E34LB1-53X E34LB2-53X E34LB3-53X —	E34JB1-53X E34JB2-53X E34JB3-53X E34JB2N8-53X
1NC	Black Red Green Red — Engraved EMERG. STOP	E34PB1-51X E34PB2-51X E34PB3-51X —	E34EB1-51X E34EB2-51X E34EB3-51X —	E34LB1-51X E34LB2-51X E34LB3-51X —	E34JB1-51X E34JB2-51X E34JB3-51X E34JB2N8-51X
1NO-1NC	Black Red Green Red — Engraved EMERG. STOP	E34PB1-1X E34PB2-1X E34PB3-1X —	E34EB1-1X E34EB2-1X E34EB3-1X —	E34LB1-1X E34LB2-1X E34LB3-1X —	E34JB1-1X E34JB2-1X E34JB3-1X E34JB2N8-1X

① Anodized aluminum head — may not be suitable for some corrosive environments.

Indicating Light Units

- Plastic Lenses



**24V Full Voltage
 Indicating Light — Red
 Catalogue Number
 E34FB24H2X**

Table 2-268. Indicating Light Units — UL (NEMA) 3, 3R, 3S, 4, 4X, 12, 13

Lamp	Type	Voltage	Colour	Indicating Light ②	LED/Lamp Number
				Catalogue Number	
LED	Full Voltage	24V AC/DC	Red Green Amber	E34FB197LRP24 E34FB197LGP24 E34FB197LAP24	Bayonet Base
		120V AC	Red Green Amber	E34FB197LRP2A E34FB197LGP2A E34FB197LAP2A	
Incandescent	Full Voltage	24V AC/DC	Red Green Amber	E34FB24H2X E34FB24H3X E34FB24H9X	#757
	Resistor	120V AC/DC	Red Green Amber	E34RB120H2X E34RB120H3X E34RB120H9X	120MB
	Transformer	120V AC 50/60 Hz	Red Green Amber	E34TB120H2X E34TB120H3X E34TB120H9X	#755

② Anodized aluminum head — may not be suitable for some corrosive environments.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

Additional Light Units **Page 2-169**
 Dimensions **Page 2-190**
 Enclosures **Pages 2-184 – 2-185**
 Legend Plates **Page 2-183**
 Replacement
 Lamps/LEDs **Page 2-156**


E34 Series, Momentary Pushbutton Components

Pushbuttons


Table 2-269. Momentary Pushbutton Operators, Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Colour	Catalogue Number
--	--------	------------------


Flush Button

	Black	E34PB1
	Red	E34PB2
	Green	E34PB3
	Yellow	E34PB4
	White	E34PB5
	Blue	E34PB6
	Grey	E34PB7
	Orange	E34PB8

Extended Button

	Black	E34EB1
	Red	E34EB2
	Green	E34EB3
	Yellow	E34EB4
	White	E34EB5
	Blue	E34EB6
	Grey	E34EB7
	Orange	E34EB8


Half Shrouded Button

		Vertical	Horizontal
		Black	E34EVB1
Red	E34EVB2	E34EHB2	
Green	E34EVB3	E34EHB3	
Yellow	E34EVB4	E34EHB4	
White	E34EVB5	E34EHB5	
Blue	E34EVB6	E34EHB6	
Grey	E34EVB7	E34EHB7	
Orange	E34EVB8	E34EHB8	

Mushroom Button

	Black	E34LB1
	Red	E34LB2
	Green	E34LB3
	Yellow	E34LB4
	Blue	E34LB6

Anodized Aluminum Jumbo Mushroom Button ①

	Black	E34JB1
	Red	E34JB2
	Red (Engraved EMER. STOP)	E34JB2N8
	Green	E34JB3
	Yellow	E34JB4

① Anodized aluminum head — may not be suitable for some corrosive environments.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see **Pages 2-114 – 2-164**.

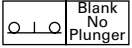
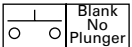
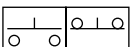
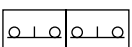
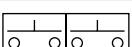
Contact Blocks

See **Page 2-181** for additional contact blocks, fingerproof shrouds and Transparent Amber coloured blocks.



Contact Block




Table 2-270. Contact Blocks

Symbol	Circuit	Catalogue Number
	NC	10250T51
	NO	10250T53
	NO-NC	10250T1
	2NC	10250T3
	2NO	10250T2

Accessories **Pages 2-186 – 2-187**
 Dimensions **Page 2-190**
 Enclosures **Pages 2-184 – 2-185**
 Legend Plates **Page 2-183**

Illuminated Pushbuttons and Indicating Lights

Table 2-271. Operators without Lens



Light Unit Type	Type	Voltage	Illuminated Pushbutton 	Indicating Light 	PresTest 	Lamp Number
			Catalogue Number	Catalogue Number	Catalogue Number	
LED (LEDs not included) ①	Full Voltage	—	E34CB497L	E34FB197L	E34FPB297L	Bayonet Base
	Transformer AC Only	24	E34XB024L	—	—	
		120	E34XB120L	E34TB120L	E34TPB120L	
		240	E34XB240L	E34TB240L	E34TPB240L	
		277	E34XB277L	E34TB277L	—	
		380	E34XB380L	E34TB380L	E34TPB380L	
		480	E34XB480L	E34TB480L	E34TPB480L	
600	E34XB600L	E34TB600L	E34TPB600L			
Incandescent	Full Voltage AC/DC	6	E34CB06	E34FB06	E34FPB06	#755
		12	E34CB12	E34FB12	E34FPB12	#756
		24	E34CB24	E34FB24	E34FPB24	#757
		32	E34CB32	E34FB32	E34FPB32	#1828
		48	E34CB48	E34FB48	E34FPB48	#1835
	Resistor ② AC/DC	120	E34SB120	E34RB120	E34RPB120	120MB
		240	E34SB240	E34RB240	E34RPB240	120MB
	Transformer AC Only	24	E34XB024	—	—	#755
		120	E34XB120	E34TB120	E34TPB120	
		240	E34XB240	E34TB240	E34TPB240	
		277	E34XB277	E34TB277	—	
		380	E34XB380	E34TB380	E34TPB380	
		480	E34XB480	E34TB480	E34TPB480	
	Neon AC/DC	120	—	E34NB120	—	NE51H-R-22
		240	—	E34NB240	—	NE51H-4-68

① These units do not include lamps. Order LED separately to match lens colour, see **Page 2-156** for LED Selection and **Pages 2-192 – 2-193** for Catalogue Numbering Structure.

② Resistor units are not available for use with LEDs, choose either transformer or full voltage LED style.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see **Pages 2-114 – 2-164**.

Table 2-272. Indicating Light Lens

	Colour	Plastic	Glass ③
		Catalogue Number	Catalogue Number
 Plastic  Glass	Red	E34H2	E34G2
	Green	E34H3	E34G3
	Yellow	E34H4	E34G4
	White	E34H5	E34G5
	Blue	E34H6	E34G6
	Amber	E34H9	E34G9
	Clear	E34H0	E34G0


③ Glass lens has black anodized aluminum bezel.

Table 2-274. PresTest Lens

	Colour	Plastic	Glass ④
		Catalogue Number	Catalogue Number
 Plastic  Glass	Red	E34V2	E34P2
	Green	E34V3	E34P3
	Yellow	E34V4	E34P4
	White	E34V5	E34P5
	Blue	E34V6	E34P6
	Amber	E34V9	E34P9
	Clear	E34V0	E34P0

④ Glass lens has black anodized aluminum bezel.

Table 2-273. Illuminated Pushbutton Lens

	Colour	Catalogue Number
	Red	E34V2
	Green	E34V3
	Yellow	E34V4
	White	E34V5
	Blue	E34V6
	Amber	E34V9
	Clear	E34V0

Dimensions **Page 2-190**
 Enclosures **Pages 2-184 – 2-185**
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 Replacement
 Lamps/LEDs **Page 2-156**

E34 Series, Assembled Devices — Push-Pull Units

Push-Pull Units

- Two- and Three-Position
- Non-illuminated

Table 2-275. 2-Position Push-Pull Units Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Position ①		Button Type/Colour ②	Push-Pull Catalogue Number	Contact Type	Mounting Location	
	Pull	Push				A	B

Maintained Push, Maintained Pull

	O	X	40 mm/Red	<u>E34GDBC2</u> -1X	1NO		
	X	O	40 mm Engraved EMERGENCY STOP/Red	<u>E34GDBC2N8</u> -1X			
			65 mm Alum. Engraved EMERGENCY STOP/Red	<u>E34GDBJ2N8</u> -1X			

① X = closed circuit, O = open circuit.

② To order different type or colour buttons, substitute the underlined characters with appropriate Suffix Code from the table below.
 Example: E34GDBC6-1X.

Table 2-276. 3-Position Push-Pull Units Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13

	Operator Position ③			Button Type/Colour ④	Push-Pull Catalogue Number	Contact Type	Mounting Location	
	Pull	Intermediate	Push				A	B

Maintained Push, Momentary Pull

X X	O X	O O	40 mm/ Black	<u>E34GFBC1</u> -3X	1NC		
			40 mm/Red	<u>E34GFBC2</u> -3X			
			40 mm Engraved EMERGENCY STOP/Red	<u>E34GFBC2N8</u> -3X	1NC		

Momentary Push, Momentary Pull

X X	O X	O O	40 mm/Black	<u>E34GEB1</u> -3X	1NC		
			40 mm/Red	<u>E34GEB2</u> -3X			
O X	O O	X O	40 mm/Black	<u>E34GHBC1</u> -1X	1NO		
			40 mm/Red	<u>E34GHBC2</u> -1X			

③ X = closed circuit, O = open circuit.

④ To order different type or colour buttons, substitute the underlined characters with appropriate Suffix Code from the Button and Colour Selection Table below. Example: E34GDBC6-1X.

Table 2-277. Button and Colour Selection Table

Standard — 40 mm	Colour	Suffix Code	Catalogue Number	Jumbo Mushroom Head ⑤ (Anodized) Aluminum — 65 mm	Colour	Suffix Code	Catalogue Number
	Black Red Red (EMERG. STOP) Green Blue	C1 C2 C2N8 C3 C6	E34C1 E34C2 E34C2N8 E34C3 E34C6		Red Red (EMER. STOP)	J2 J2N8	E34J2 E34J2N8

⑤ Anodized aluminum may not be suitable for use on some corrosive applications.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see **Pages 2-114 – 2-164.**

Accessories **Pages 2-186 – 2-187**
 Dimensions **Page 2-190**
 Enclosures **Pages 2-184 – 2-185**
 Legend Plates **Page 2-183**

Illuminated Push-Pull Units

- Two-Position Maintained
- Illuminated



*120V Resistor
 Illuminated 2-Position
 Push-Pull — Red
 (Standard) Catalogue
 Number E34GDB79M2*

Table 2-278. 2-Position Illuminated Maintained Push, Maintained Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①		Lamp	Type	Voltage	Red Standard Push-Pull ② Catalogue Number	Contact Type	Mounting Location		LED/Lamp Number
Maintained — Pull	Maintained — Push						A	B	
O X	X O	LED	Full Voltage	24V AC/DC	E34GDB97LRD24-1X	1NO			Bayonet Base
				120V AC/DC	E34GDB97LRD2A-1X				
			Transformer	24V AC	E34GDB89LRD06-1X	1NC			
				120V AC	E34GDB63LRD06-1X				
O X	X O	Incandescent	Full Voltage	24V AC/DC	E34GDB79M2-1X	1NO			#757
				Resistor	120V AC/DC				E34GDB80M2-1X
			Transformer	24V AC	E34GDB89M2-1X	1NC			
				120V AC	E34GDB63M2-1X				#755

① X = closed circuit, O = open circuit.

② To order different type or colour lens, substitute the underlined characters with appropriate Suffix Code from Lens and Colour Selection Table below.
 Example: E34GDB79 M3-1X. For LEDs with different voltages see ordering example on Page 2-175.

Table 2-279. Lens and Colour Selection Table

Type	Colour	Incand. Suffix Code	LED Suffix Code	Catalogue Number
Standard 	Red	M2	RD	E34M2
	Red (EMER. STOP)	M2N8	ED	E34M2N8
	Green	M3	GD	E34M3
	Blue	M6	LD	E34M6
	Amber	M9	AD	E34M9
	White	M5	WD	E34M5
	Clear	M0	CD	E34M0

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

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E34 Series, Assembled Devices — Illuminated Push-Pull Units

**Illuminated Push-Pull Units
 (Continued)**

- Three-Position Momentary
- Illuminated



*120V AC Transformer
 Illuminated 3-Position
 Push-Pull — Red
 (Standard) Catalogue
 Number E34GHB63M2*

Table 2-280. 3-Position Illuminated Momentary Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①			Lamp	Type	Voltage	Red Standard Push-Pull ② Catalogue Number	Contact Type	Mounting Location		LED/Lamp Number				
Momentary Pull	Maintained Intermediate	Momentary Push						A	B					
			LED	Full Voltage	24V AC/DC	<u>E34GHB97LRD24-1X</u>	1NO 1NC			Bayonet Base				
O X	O O	X O			120V AC	<u>E34GHB97LRD2A-1X</u>								
					Transformer	24V AC					<u>E34GHB89LRD06-1X</u>			
						120V AC					<u>E34GHB63LRD06-1X</u>			
X X	O X	O O			Full Voltage	24V AC/DC	<u>E34GEB97LRD24-3X</u>	1NC 1NC				Bayonet Base		
						120V AC	<u>E34GEB97LRD2A-3X</u>							
					Transformer	24V AC	<u>E34GEB89LRD06-3X</u>							
						120V AC	<u>E34GEB63LRD06-3X</u>							
O X	O O	X O	Incandescent	Full Voltage	24V AC/DC	<u>E34GHB79M2-1X</u>	1NO 1NC			#757				
					Resistor	120V AC				<u>E34GHB80M2-1X</u>	120MB			
					Transformer	24V AC				<u>E34GHB89M2-1X</u>	#755			
						120V AC				<u>E34GHB63M2-1X</u>				
				X X	O X	O O		Full Voltage	24V AC/DC	<u>E34GEB79M2-3X</u>	1NC 1NC			#757
									Resistor	120V AC				<u>E34GEB80M2-3X</u>
								Transformer	24V AC	<u>E34GEB89M2-3X</u>				#755
									120V AC	<u>E34GEB63M2-3X</u>				

① X = closed circuit, O = open circuit.

② To order different type or colour lens, substitute the underlined characters with appropriate Suffix Code from Lens and Colour Selection Table on the bottom of Page 2-171. Example: E34GEB79M3-3X. For LEDs with different voltages see ordering example on Page 2-175.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

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E34 Series, Assembled Devices — Illuminated Push-Pull Units and Potentiometers

Illuminated Push-Pull Units (Continued)

- Three-Position — Maintained Push, Momentary Pull
- Illuminated



120V Resistor Illuminated 3-Position Push-Pull — Red (Standard) Catalogue Number E34GFB80M2

Table 2-281. 3-Position Illuminated Maintained Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ①			Lamp	Type	Voltage	Red Standard Push-Pull ② Catalogue Number	Contact Type	Mounting Location		LED/Lamp Number	
Momentary Pull	Maintained Intermediate	Maintained Push						A	B		
			LED	Full Voltage	24V AC/DC	<u>E34GFB97LRD24-3X</u>	1NC			Bayonet Base	
X	O	O			120V AC	<u>E34GFB97LRD2A-3X</u>					
X	X	O			Trans-former	24V AC	<u>E34GFB89LRD06-3X</u>	1NC			
						120V AC	<u>E34GFB63LRD06-3X</u>				
X X	O X	O O	Incan-descent	Full Voltage	24V AC/DC	<u>E34GFB79M2-3X</u>	1NC			#757	
					Resistor	120V AC				<u>E34GFB80M2-3X</u>	120MB
					Trans-former	24V AC	<u>E34GFB89M2-3X</u>	1NC			#755
						120V AC	<u>E34GFB63M2-3X</u>				

① X = closed circuit, O = open circuit.
 ② To order different type or colour lens, substitute the underlined characters with appropriate Suffix Code from table on the bottom of Page 2-171. Example: E34GFB79M3-3X. For LEDs with different voltages see ordering example on Page 2-175.

Potentiometers

Table 2-282. Potentiometer with Knob and Standard Dial Plate — Linear Type ±10% — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Vertical or Horizontal One-Hole Mounting	Potentiometer Ohms	2 Watt (60V Max.) Single Potentiometer with Standard Aluminum Dial Plate ③④	Dimensions in Inches (mm)
		Catalogue Number	
	1000	<u>E34PDB1F1</u>	
	2500	<u>E34PDB1F2</u>	
	5000	<u>E34PDB1F5</u>	
	10000	<u>E34PDB1F10</u>	
	25000	<u>E34PDB1F25</u>	
	50000	<u>E34PDB1F50</u>	
	Operator Only ⑤	<u>E34PDB1A0</u>	
	Alternative – Black Plastic Large Legend with Standard Markings	<u>E34LP99</u>	

③ Large dial plate with space for legend is available at no charge. To order, add Suffix 36 to Catalogue Number. Example: E34PDB1F136. To order separately, see footnote ④ below.
 ④ Large dial plate has space at top for 15 letters. 3/32 inch high. For custom stamped legend plates, order legend plate as separate item 10250TR30 and specify stamping.
 ⑤ For use with commercially purchased potentiometers having shaft dimensions per dimension drawing on Page 2-160.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

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E34 Series, Push-Pull Components



2-Position Maintained Push-Pull without Button on Lens
Catalogue Number
E34GDB

Push-Pull Operators

An illuminated Push-Pull pushbutton unit, arranged for one-hole mounting, can replace two pushbuttons and a pilot light or the non-illuminated form can replace two pushbuttons. These units are available in three basic types:

- **Maintained** – (Two-Position). Maintains in the pulled or pushed position until manually actuated to the opposite mode.

- **Momentary** – (Three-Position). Spring returns to an intermediate position when pulled or pushed and released.
- **Momentary Pull, Maintained Push** – (Three-Position). Spring returns to intermediate position when pulled. Maintains in pushed position until manually returned to intermediate (ready to reset) position. Maintained stop holds circuit open and will prevent other series connected operators from starting the system.

The Operators, Buttons, Contact Blocks, etc., are offered as building block components that can be intermixed to satisfy many requirements. This minimizes the need for a varied and costly inventory.

Application Guide

To assist in the selection of contact blocks, the sketch to the right shows pictorially by symbols **A** and **B** locations of contact blocks and adapter to the operator. The chart below shows the effect of the push and pull operations on either NO or NC contacts. (X = contact closed, O = contact open)

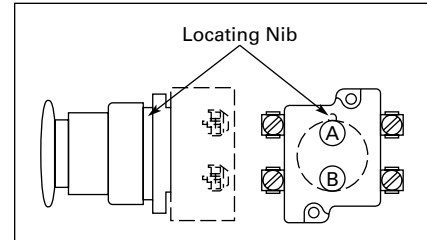


Figure 2-122. Contact Circuit Locations

Table 2-283. Push-Pull Operator Components

Type of Operator	Catalogue Number	Contact Block Max. of 2 Blocks, 4 Circuits ①	Operator Position and Circuit Arrangement								
			Out – Pull		Intermediate		In – Push				
			Contact Block Mounting Location								
						A	B	A	B	A	B
2-Position Operator without Lens											
Maintained Push-Pull	E34GDB	1NO	O	or	O	No Intermediate Position		X	or	X	
		1NC	X		X			O		O	
		2NO	O		O			X		X	
		2NC	X		X			O		O	
3-Position Operator without Lens											
Momentary Push-Pull	E34GEB ①	1NO	O	or	O	O	or	O	X	or	O
		1NC	X		X	O		X	O	O	
Maintained Push-Momentary Pull	E34GFB ①	2NO	O		O	O		O	X		O
		2NC	X		X	O		X	O	O	
Momentary Push-Pull	E34GHB ①	1NO	O	or	O	O	or	O	X	or	X
		1NC	X		X	O	or	O	O	or	O
		2NO	O		O	O		O	X		X
		2NC	X		X	O		O	O		O

① Special function contact blocks shown on Page 2-181 CANNOT be used with 3-position push-pull operators E34GEB, E34GFB or E34GHB.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

Note: See Typical Applications on Page 2-128.

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E34 Series, Push-Pull Components

Push-Pull Operators (Continued)



Push-Pull Light Units, Lenses and Buttons

Table 2-284. Light Units for Illuminated Push-Pull Devices

Light Unit Type	Type	Voltage	Catalogue Number	LED/Lamp Number
LED (LEDs not included) ①	Full Voltage	—	10250T97L	Bayonet Base
	Transformer AC Only 50/60 Hz	24	10250T89L	
		120	10250T63L	
		208	10250T64L	
		240	10250T65L	
		277	10250T82L	
		380	10250T66L	
		480	10250T67L	
		600	10250T68L	
	Incandescent	Full Voltage AC or DC	6	10250T69
12			10250T70	#756
24/28			10250T79	#757
32			10250T83	#1828
Resistor AC or DC		120	10250T80	120MB
		240	10250T81	
Transformer AC Only 50/60 Hz		24	10250T89	#755
		120	10250T63	
		208	10250T64	
		240	10250T65	
		277	10250T82	
		380	10250T66	
480		10250T67		
600	10250T68			

① These units do not include lamps. Order LED separately to match lens colour from chart at right.


Table 2-285. Buttons for Non-illuminated Push-Pull Devices

	Colour	Incand. Suffix Code	Catalogue Number
	Black	C1	E34C1
	Red	C2	E34C2
	Red (EMERG. STOP)	C2N8	E34C2N8
	Green	C3	E34C3
	Blue	C6	E34C6
	Jumbo — Red ②	J2	E34J2
	Jumbo — Red (EMERGENCY STOP)	J2N8	E34J2N8

② Anodized aluminum may not be suitable for use on some corrosive applications.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see **Pages 2-114 – 2-164**.

Table 2-286. Alternate Lenses for Illuminated Push-Pull Devices

	Colour	Incand. Suffix Code	LED Suffix Code ③	Catalogue Number
	Red	M2	RD	E34M2
	Red (EMERG. STOP)	M2N8	ED	E34M2N8
	Green	M3	GD	E34M3
	Blue	M6	LD	E34M6
	Amber	M9	AD	E34M9
	White	M5	WD	E34M5
	Clear	M0	—	E34M0

③ Suffix Codes should only be used for assembling composite Catalogue Numbers. To order lens, order by Catalogue Number.

Table 2-287. LED Selection Table

Voltage	Colour	Catalogue Number
6-12V AC/DC	Red	E22LED612RN
	Orange	E22LED612ON
	Yellow	E22LED612YN
	Green	E22LED612GN
	Blue	E22LED612BN
24V AC/DC	White	E22LED612WN
	Red	E22LED024RN
	Orange	E22LED024ON
	Yellow	E22LED024YN
	Green	E22LED024GN
48V AC/DC	Blue	E22LED024BN
	White	E22LED024WN
	Red	E22LED048RN
	Orange	E22LED048ON
	Yellow	E22LED048YN
60V AC/DC	Green	E22LED048GN
	Blue	E22LED048BN
	White	E22LED048WN
	Red	E22LED060RN
	Orange	E22LED060ON
120V AC/DC	Yellow	E22LED060YN
	Green	E22LED060GN
	Blue	E22LED060BN
	White	E22LED060WN
	Red	E22LED120RN
	Orange	E22LED120ON
	Yellow	E22LED120YN
	Green	E22LED120GN
	Blue	E22LED120BN
	White	E22LED120WN

Note: For a complete listing of all LEDs available, see **Page 2-164**.

Ordering example with one composite number:

Non-illuminated **E34GDB + E34C2 + 10250T1 = E34GDBC2-1X**

Incandescent **E34GDB + 10250T79 + E34M2 + 10250T1 = E34GDB79M2-1X**

LED **E34GDB + 10250T97L + E34M2 + Voltage Code + 10250T1 = E34GDB97LRD24-1X**

06 — 6V AC/DC
 12 — 12V AC/DC
 24 — 24V AC/DC
 48 — 48V AC/DC
 60 — 60V AC/DC
 2A — 120V AC
 2D — 120V DC

Contact Blocks..... **Page 2-181**
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E34 Series, Assembled Devices — Selector Switch Units

Selector Switch Units

- Two-, Three- and Four-Position Maintained
- Non-illuminated and Illuminated



2-Position Maintained Switch



4-Position Maintained Switch

Table 2-288. 2-Position Selector Switch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ^①		Operator Action ^②	Non-illuminated		Illuminated — 120V Transformer		Contact Type	Mounting Location		Cam Code
			Black Knob ^③	Black Lever ^③	Red Knob ^③	Red Lever ^③		A	B	
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number				
X O	O X		E34VFBK1-1X	E34VFB1-1X	E34VFB120ER-1X	E34VFB120FR-1X	1NC 1NO			1

① X = closed circuit, O = open circuit.

② M = Maintained.

③ To order different type or colour selector switch, substitute the underlined character with appropriate Suffix Code from the Colour Selection table.
Example: E34VFBK2-X1.

Table 2-289. 3-Position Selector Switch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ^④			Operator Action ^⑤	Non-illuminated		Illuminated — 120V Transformer		Contact Type	Mounting Location		Cam Code
				Black Knob ^⑥	Black Lever ^⑥	Red Knob ^⑥	Red Lever ^⑥		A	B	
				Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number				
X O	O O	O X	E34VHBK1-2X	E34VHBL1-2X	E34VHB120TER-2X	E34VHB120TFR-2X	1NO 1NO			3	
X O O	O X O	O O X	E34VHBK1-23X	E34VHBL1-23X	E34VHB120TER-23X	E34VHB120TFR-23X	1NO 2NC (Series) 1NO			3	

④ X = closed circuit, O = open circuit.

⑤ M = Maintained.

⑥ To order different type or colour selector switch, substitute the underlined character with appropriate Suffix Code from the Colour Selection table.
Example: E34VFBK2-X1.

Table 2-290. 4-Position Selector Switch — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Operator Position ^⑦				Operator Action ^⑧	Non-illuminated		Illuminated — 120V Transformer		Contact Type	Mounting Location		Cam Code
					Black Knob ^⑨	Black Lever ^⑨	Red Knob ^⑨	Red Lever ^⑨		A	B	
					Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number				
X O O O	O X O O	O O X O	O O O X		E34VTBK1-23X	E34VTBL1-23X	E34VRB120TER-23X	E34VRB120TFR-23X	1NC 1NO 1NO 1NO 1NC			7

⑦ X = closed circuit, O = open circuit.

⑧ M = Maintained.

⑨ To order different type or colour selector switch, substitute the underlined character with appropriate Suffix Code from the Colour Selection table.
Example: E34VFBK2-X1.

Table 2-291. Colour Selection, Non-illuminated

Colour	Code Letter
Black	1
Red	2
Green	3
Yellow	4
White	5
Blue	6
Grey	7
Orange	8

Note: For Light Unit Voltage Suffix and Knobs, Levers tables, see Page 2-180.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

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 Additional Circuit Arrangements Pages 2-177 – 2-178
 Dimensions Page 2-190
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E34 Series

Selector Switch Selection

Cam and Contact Block Selection

Selector switches in their varied forms (2-position, 3-position and 4-position) are a big factor contributing to the great flexibility of control that a well rounded line of "pushbuttons" can achieve. Because of their flexibility, they tend to cause difficulty with product selection and application. The following systematic approach should simplify that task.

Cam and contact block selection is better understood if you:

- Work with each incoming and outgoing wire/circuit separately.
- Recognize the terms NO and NC only identify the type of contact by its mode before mounting to the operator. The "X-O" chart (Page 2-178) shows how that contact will act after assembly to the operator with the selected cam shape. X = closed circuit, O = open circuit.
- Up to six NO or NC contacts may be mounted behind each plunger location for a total of twelve contacts. Single circuit contact blocks have only one plunger with the other side of the block "open." Therefore, single circuit contact blocks transmit motion to blocks behind them only for the position containing the circuit.
- Each cam has two separate lobes, each of which operates one of the two contact block plungers independently of each other. Those are identified as position A (locating nib side) and position B (opposite of locating nib). The position designations give direction in selecting and mounting of the contact blocks (see Illustration below).

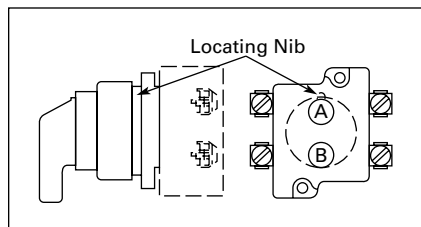


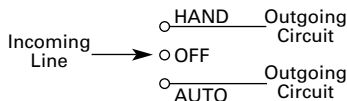
Figure 2-123. Contact Circuit Locations

Systematic Approach

Application: **HAND-OFF-AUTO** Selector Switch. In this circuit, one incoming line is distributed to two other outgoing circuits by the switch. The two circuits can be looked at individually.

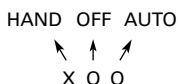
Step 1: Elementary Diagram.

Construct on paper, or in your mind, a simple elementary diagram of the switching scheme as follows:



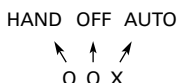
Step 2: "X-O" Pattern.

From the elementary diagram, you can construct an "X-O" diagram which describes when the contacts are to be closed (X) or open (O) in the various positions of the switch. The "X-O" for the **HAND** circuit looks like this:



In this circuit, you want a contact closed on the left (HAND) but open in the centre and right.

For the **AUTO** circuit, the "X-O" diagram would look like this:



Putting them together, the complete "X-O" diagram is:



Once the "X-O" diagram has been generated, the next step is to select the cam and contact block, or blocks, needed to perform the desired "X-O" functions. The selection table on the following page lists the various types (shapes) of cams by number to choose from and the type of contact and position to achieve the function outlined in your "X-O" diagram.

Step 3: Cam Selection.

The cam you select determines the operation of all contact blocks mounted to the operator. It is selected on the basis that it provides the simplest circuitry for the desired "X-O" diagram. The selection tables of the following page show all the "X-O" combinations. For the purpose of this example, the applicable portion of those charts is shown in **Table 2-292**.

Table 2-292. Example Selection Table

No.	"X-O" Pattern	Cam Code #2		Cam Code #3	
		Top A	Bottom B	Top A	Bottom B
1	X O O				
4	O O X				

① Wired in series.

Now to make the cam selection, make a simple worksheet such as:

	Cam 2	Cam 3
X O O	(A)NO - (B)NC	(A)NO
O O X	(B)NO	(B)NO

It becomes immediately obvious that cam 3 is the better choice for two reasons, (1) the series combination can be avoided making it simpler to wire, (2) only two contacts are required, which is less expensive than the three contacts required by cam 2.

Step 4: Contact Block Selection.

Having selected the cam, contact block selection is simply a matter of gathering the A position and B position circuits into pairs which make up the most convenient contact block arrangement. If there is an imbalance in the number of circuits under A or B, then single circuit blocks must be selected for these leftover circuits.

Back to the worksheet, having selected cam 3 do this:



Step 5: Selector Switch Operator.

Lastly, you have to choose from the many types of operators — knob and lever in various colours or keyed. Also what combinations of maintained and spring return functions are required. Selection of these operators can be found on **Page 2-179**. For the above example you may want a 3-position maintained black knob, cam 3 — Catalogue Number E34VHBK1.

The Complete Switch: E34VHBK1 with one 10250T2 or, for one composite catalogue number, E34VHBK1-Y1 found on **Page 2-176**.

E34 Series, Selector Switch Selection

Selector Switch Selection
(Continued)

Table 2-293. 2-Position Selector Switch Contact Block Selection

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function	
		Top Plunger A	Bottom Plunger B
1	X O	NC	NC
2	O X	NO	NO

Diagrams

Circuits shown illustrate connections to obtain a selector switch circuit combination and are shown with their appropriate line diagrams. Field wiring of jumper connections required as shown.

X = Closed Circuit
O = Open Circuit

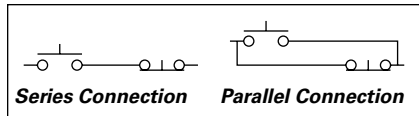


Figure 2-124. Wiring of Jumper Connections

Note: 4-Position Selector Switches limited to 4 contact blocks.

Contact Blocks

For selection and number of available contact blocks per operator, see Page 2-181.

Table 2-294. 3-Position Switch — Cam and Contact Block Selection

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function (Jumpers must be installed where indicated)			
		Operator with Cam Code #2		Operator with Cam Code #3	
		Mounting Location		Mounting Location	
		Top Plunger A	Bottom Plunger B	Top Plunger A	Bottom Plunger B
1	X O O	NO	NC	NO	
2	X X O		NC		NC
3	X O X	NO		NO	NO
4	O O X		NO		NO
5	O X X	NC	NO	NC	
6	O X O	NC		NC	NC

Table 2-295. 4-Position Switch — Contact Block Selection

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function		Combination No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function	
		Mounting Location				Mounting Location	
		Top Plunger A	Bottom Plunger B			Top Plunger A	Bottom Plunger B
1	X O O O	NC		10	X O X O	NC	NO
2	O X O O		NO			NO	NO
3	O O X O	NO		11	X X X O	NC	NO
4	O O O X		NC			NO	NO
5	X O O X	NC	NC	12	O X X X	NO	NC
6	O X X O	NO	NO			NO	NO
7	O O X X	NO	NC	13	X O X X	NO	NC
8	X X O O	NC	NO			NO	NC
9	O X O X		NO	14	X X O X	NC	NO

April 2009

E34 Series, Selector Switch Components



2-Position Maintained Black Knob Selector Switch — Cam 1
Catalogue Number E34VFBK1



3-Position Maintained Keyed Selector Switch
Catalogue Number E34KGHB1

Selector Switch Operators

Table 2-296. Operators with Knob Assembled — UL (NEMA)
3, 3R, 4, 4X, 12, 13

Positions	Operator Action ①	Black Knob Selector Switch — Vertical Mounting ③	
		Cam Code ②	Catalogue Number ④
2-Position — 60° Throw		1	<u>E34VFBK1</u>
		1	<u>E34VEBK1</u>
3-Position — 60° Throw		2 3	<u>E34VGBK1</u> <u>E34VHBK1</u>
		2 3	<u>E34VJBK1</u> <u>E34VKBK1</u>
		2 3	<u>E34VLBK1</u> <u>E34VMBK1</u>
		2 3	<u>E34VNBK1</u> <u>E34VPBK1</u>
		2 3	<u>E34VNBK1</u> <u>E34VPBK1</u>
4-Position — 40° Throw		7	<u>E34VTBK1</u>

- ① M = Maintained. S = Spring return in direction of arrow (→).
- ② For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on Pages 2-177 – 2-178.
- ③ Field convertible to Horizontal Mounting.
- ④ For other colours of either the knob or lever, replace the underlined characters of the Catalogue Number with the appropriate Suffix Code from Alternate Knob and Lever Table below. Example: E34VFBL2.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 2-114 – 2-164.

Table 2-297. Key Operators with Cam and Cap — UL (NEMA)
3, 3R, 4, 4X, 12, 13

Positions	Operator Action ⑤	Cam Code ⑥	Key Removal Positions ⑦	Vertical Mounting	Horiz. Mounting
				Catalogue Number	Catalogue Number
2-Position — 60° Throw		1	1, 2, 3	E34KFB_	E34KFHB_
		1	2	E34KEB_	E34KEHB_
3-Position — 60° Throw		2 3	1 – 7	E34KGB_	E34KGHB_
		2 3	1, 4, 5	E34KJB_	E34KJHB_
		2 3	4	E34KLB_	E34KLHB_
		2 3	2, 4, 6	E34KNB_	E34KNHB_
		2 3	2, 4, 6	E34KPB_	E34KPHB_
4-Position — 40° Throw		7	7	E34KTB_	E34KTHB_

- ⑤ M = Maintained. S = Spring return in direction of arrow (→).
- ⑥ For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on Pages 2-177 – 2-178.
- ⑦ Choose key removal position required for application from Table 2-298. Add key removal Code No. to listed Catalogue Number. Example: E34KFB2.

Table 2-298. Key Removal Positions

Code Suffix	Key Removal Positions	Code Suffix	Key Removal Positions
1	Right Only	5	Right & Centre
2	Left Only	6	Left & Centre
3	Right & Left	7	All Positions
4	Centre Only		

Note: Key removal in “spring return from” positions not recommended.

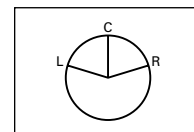


Figure 2-125. Key Removal Positions

Dissimilar Locks and Keys

Listed operators have identical locks and keys (Key Code H661), Catalogue Number 10250ED824. For dissimilar lock and key combinations, see Page 2-135.

Table 2-299. Alternate Knobs and Levers for Operators Above

Colour	Knob		Lever		Lever Designed for Added Ingress Protection ⑧	
	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number
Black	K1	E34K1	L1	E34L1	A1	E34A1
Red	K2	E34K2	L2	E34L2	A2	E34A2
Green	K3	E34K3	L3	E34L3	A3	E34A3
Yellow	K4	E34K4	L4	E34L4	A4	E34A4
White	K5	E34K5	L5	E34L5	A5	E34A5
Blue	K6	E34K6	L6	E34L6	A6	E34A6
Grey	K7	E34K7	L7	E34L7	A7	E34A7
Orange	K8	E34K8	L8	E34L8	A8	E34A8

⑧ For use on maintained operators only.

Accessories Page 2-186 – 2-187
Dimensions Page 2-190
Legend Plates Page 2-183



E34 Series, Selector Switch Components



**2-Position Maintained
 120V AC Transformer
 Selector Switch, Cam 1
 Catalogue Number E34VFB120**

Illuminated Selector Switch Operators

Table 2-300. Operator without Knob or Lever

Positions	Operator Action	Transformer Type — 50/60 Hz		Full Voltage Type — AC or DC ^③	
		6 Volt #755 Lamp		Lamps — #755, #757, #1835, 120MB ^④	
		Catalogue Number ^{① ⑤}		Catalogue Number ^⑤	
2-Position — 60° Throw		Cam Code 1 ^②		Cam Code 1 ^②	
		E34VFB_		E34SFB_	
3-Position — 60° Throw		Cam Code 2 ^②	Cam Code 3 ^②	Cam Code 2 ^②	Cam Code 3 ^②
		E34VGB_	E34VHB_	E34SGB_	E34SHB_
		E34VNB_ ^⑥	E34VPB_ ^⑥	E34SNB_ ^⑦	E34SPB_ ^⑦
		E34VJB_ ^⑥	E34VKB_ ^⑥	E34SJB_ ^⑦	E34SKB_ ^⑦
4-Position — 40° Throw		E34VLB_	E34VMB_	E34SLB_	E34SMB_
		E34VRB_	—	E34SRB_	—

- ① Operator includes lens gasket and lens attachment screws.
- ② For selection of the proper cam and contact block required to obtain a specific circuit sequence, see selection table on **Pages 2-177 – 2-178**.
- ③ Full voltage light units can be used at other than listed voltages by changing lamp. Replacement lamps are listed in **Page 2-156**.
- ④ 120MB lamps are used on both 120V and 240V operators.
- ⑤ Add Code Suffix for Light Unit Voltage to listed Catalogue Number from Light Unit Voltage Suffix Table at bottom of page.
 Example: For 24V transformer type light unit, order E34VFB024.
- ⑥ 120 and 240V transformer only.
- ⑦ 120 full voltage only.

Table 2-301. Light Unit Voltage Suffix — Add to operator Catalogue Number listed in table above.

Type of Light Unit			
Transformer Type 50/60 Hz		Full Voltage Type AC or DC ^⑧	
Voltage	Suffix Code	Voltage	Suffix Code
24	024	6	06
120	120	12	12
208	208	24	24
240	240	48	48
380	380	120	120
480	480	240 ^⑨	240
600	600		

- ⑧ Full voltage light units can be used at other than listed voltages by changing lamp. Replacement lamps are listed in **Page 2-156**.
- ⑨ Resistor type. May generate excess heat if used in high density.

Table 2-302. Knobs, Levers

	Colour ^⑩	Knob	Lever
		Catalogue Number and Code Number	
	Red	10250TER	10250TFR
	Green	10250TEG	10250TFG
	Yellow	10250TEA	10250TFA
	Blue	10250TEL	10250TFL
	Clear	10250TEC	10250TFC
	White	10250TEW	10250TFW
	Amber	10250TEM	10250TFM

⑩ Amber, clear and white lenses have a black arrow (pointer). Red, green and blue lenses have a white arrow (pointer).

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see **Pages 2-114 – 2-164**.

Contact Blocks **Page 2-181**
 Dimensions **Page 2-190**
 Enclosures **Pages 2-184 – 2-185**
 Legend Plates **Page 2-183**

Contact Blocks

Standard Contact Blocks

- UL A600/P600 rated
- Colour-coded plungers – red/green for NC/NO circuits
- Silver contact tips with “reliability nibs”
- Black (opaque) or amber (translucent) housings
- Pressure plate or spade terminals
- Fingerproof shrouds (for pressure terminals only)

Logic Level Contact Blocks

- UL A600/P600 rated
- Black plungers
- Inert palladium knife-blade contacts
- Black (opaque) housings
- Pressure plate or spade terminals
- Fingerproof shrouds not available

Special Function Contact Blocks

- UL A600/P600 rated
- Black plungers
- Silver contact tips with “reliability nibs”
- Black (opaque) housings
- Pressure plate terminals only
- Fingerproof shrouds not available

Special Purpose Contact Block

- Maximum 300V rated
- Black plungers
- Silver contact tips with “reliability nibs”
- Black (opaque) housings
- Pressure plate terminals only
- Fingerproof shrouds not available

Reliability Nibs

Reliability nibs are the hallmark of Eaton’s Cutler-Hammer contact blocks. A pointed silver nib on the contact tip

ensures reliable switching from logic level (5V) up to 600V applications. Therefore standard contact blocks can be used for most logic level applications where the contacts are not exposed to any harsh environmental conditions.

Palladium Contacts

Palladium, which is more inert than gold, is well suited for voltages and currents approaching zero and is recommended for applications where environmental conditions are a factor.

Maximum Contact Block Mounting per Operator Type

Operator	Max. Stack	Operator	Max. Stack
Pushbuttons	6	2- or 3-Position Selector Switches	6
Push-Pull Operators	2	4-Position Selector Switches	4
Roto-Push Operators	4	Joysticks	4

Table 2-303. Contact Blocks

Symbol	Circuit	Description/Notes ①	Standard		Logic Level	
			Pressure Terminals	Spade Terminals ②	Pressure Terminals	Spade Terminals ②
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
	1NC	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T51	10250T59	10250T51E	10250T59E
	1NO	Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T53	10250T60	10250T53E	10250T60E
	NO-NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T1	10250T40	10250T1E	10250T40E
	2NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T3	10250T42	10250T3E	10250T42E
	2NO	Stack up to 6 blocks (12 circuits) unless otherwise noted.	10250T2	10250T41	10250T2E	10250T41E

Special Function Blocks ③

	LONC	Late opening NC. Stack up to 6 blocks (6 circuits) unless otherwise noted.	10250T71 ③	—	10250T71E ③	—
	ECNO-NC	Early closing NO and standard NC. Stack up to 6 blocks unless otherwise noted.	10250T47 ③ ④	—	10250T47E ③	—
	ECNO-NO	Early closing NO and standard NO. Stack up to 4 blocks unless otherwise noted.	10250T57 ③ ④	—	10250T57E ③	—
	2LONC	Two late opening NC contacts. Stack up to 6 blocks unless otherwise noted.	10250T45 ③	—	10250T45E ③	—
	LONC-ECNO	Overlapping contacts. Stack up to 4 blocks unless otherwise noted.	10250T55 ③ ④	—	10250T55E ③	—

Special Purpose Blocks ⑤

	2NO-2NC	Four circuits in single block depth. Rated 300V max. Stack up to 4 blocks unless otherwise noted.	10250T44 ⑤	—		
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① All 10250T contact blocks shown are suitable for use on standard 10250T and E34 operators. These contact blocks are not suitable for Class I Division 2 type 10250T or E34 devices.

② Contact blocks with spade terminals are limited to a maximum of one contact block per operator and minimum spacing between devices is 2.5” (63.5 mm). Not suitable for use in 10250T or E34 enclosures. Also available in amber housing. Not available with fingerproof shrouds.

③ Special function contact blocks are not suitable for use with roto-push operators, 3-position push-pull operators, or 4-position selector switches.

④ ECNO contact blocks are not suitable for use with 2-position joysticks or when operators are used with padlock attachments.


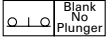

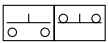
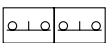
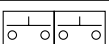
⑤ Special purpose 10250T44 contact blocks are not suitable on selector switches or roto-push operators. Okay to use with 3-position push-pull operators only on low voltage (30V or less) circuits.



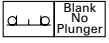
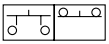
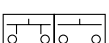
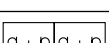
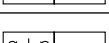
E34 Series, Components — Contact Blocks

Contact Blocks (Continued)

Table 2-304. Contact Blocks with Fingerproof Shrouds

Symbol	Circuit	Description/ Notes ①	 10250T1CP	Standard	Logic Level
				Pressure Terminals ②	Pressure Terminals ②
				Catalogue Number	Catalogue Number
 Blank No Plunger	1NC	Stack up to 6 blocks (6 circuits) unless otherwise noted.		10250T51P	10250T51EP
 Blank No Plunger	1NO	Stack up to 6 blocks (6 circuits) unless otherwise noted.		10250T53P	10250T53EP
	NO-NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.		10250T1P	10250T1EP
	2NC	Stack up to 6 blocks (12 circuits) unless otherwise noted.		10250T3P	10250T3EP
	2NO	Stack up to 6 blocks (12 circuits) unless otherwise noted.		10250T2P	10250T2EP

Special Function Blocks ④

 Blank No Plunger	LONC	Late opening NC. Stack up to 6 blocks (6 circuits) unless otherwise noted.		10250T71P ④	10250T71EP ④
	ECNO-NC	Early closing NO and standard NC. Stack up to 6 blocks unless otherwise noted.		10250T47P ④ ⑤	10250T47EP ④
	ECNO-NO	Early closing NO and standard NO. Stack up to 4 blocks unless otherwise noted.		10250T57P ④ ⑤	10250T57EP ④
	2LONC	Two late opening NC contacts. Stack up to 6 blocks unless otherwise noted.		10250T45P ④	10250T45EP ④
	LONC-ECNO	Overlapping contacts. Stack up to 4 blocks unless otherwise noted.		10250T55P ④ ⑤	10250T55EP ④

① All 10250T contact blocks shown are suitable for use on standard 10250T and E34 operators. These contact blocks are not suitable for Class I Division 2 type 10250T or E34 devices.

② To order contact blocks with translucent amber housing, change Suffix P to CP in Catalogue Number e.g. 10250T51CP.

③ Contact blocks with spade terminals are limited to a maximum of one contact block per operator and minimum spacing between devices is 2.5" (63.5 mm). Not suitable for use in 10250T or E34 enclosures. Also available in amber housing. Not available with fingerproof shrouds.

④ Special function contact blocks are not suitable for use with roto-push operators, 3-position push-pull operators, or 4-position selector switches.

⑤ ECNO contact blocks are not suitable for use with 2-position joysticks or when operators are used with padlock attachments.

Ratings Page 2-166
Dimensions Pages 2-159 – 2-161

E34 Series, Legend Plates

Options

Legend Plates

Field Colour

Legend plates can be supplied printed on black, red, silver or white field. To order legend printed on a colour other than indicated — add Suffix Code to the end of the Catalogue Number as follows:

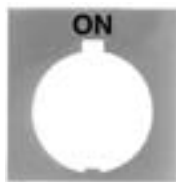
“R” for Red field;
 “W” for White field; or
 “S” for Silver field.

Example: E34SP26R — Standard plate with red field marked OPEN.

Table 2-305. For Pushbutton Operators and Indicating Lights

Legend	Colour of Field	Catalogue Number	
		Standard ^①	Jumbo
Letters on Legend Plates Below are 3/16" High			
CLAMP	Black	E34SP90	E34LP90
CLOSE	Black	E34SP73	E34LP73
DOWN	Black	E34SP74	E34LP74
EMERG. STOP	Red	E34SP13	E34LP13
FAST	Black	E34SP75	E34LP75
FASTER	Black	E34SP87	E34LP87
FEEDER ON	Black	E34SP94	E34LP94
FEEDER OFF	Black	E34SP95	E34LP95
FORWARD	Black	E34SP15	E34LP15
HIGH	Black	E34SP16	E34LP16
IN	Black	E34SP17	E34LP17
INCH	Black	E34SP18	E34LP18
JOG	Black	E34SP19	E34LP19
JOG FOR.	Black	E34SP20	E34LP20
JOG REV.	Black	E34SP21	E34LP21
LOW	Black	E34SP22	E34LP22
LOWER	Black	E34SP23	E34LP23
LUBE-FAIL	Black	E34SP92	E34LP92
MOTOR RUN	Black	E34SP81	E34LP81
MOTOR STOP	Black	E34SP82	E34LP82
OFF	Red	E34SP24	E34LP24
ON	Black	E34SP25	E34LP25
OPEN	Black	E34SP26	E34LP26
OUT	Black	E34SP27	E34LP27
POWER ON	Black	E34SP80	E34LP80
RAISE	Black	E34SP28	E34LP28
READY	Black	E34SP86	E34LP86
RESET	Black	E34SP29	E34LP29
REVERSE	Black	E34SP30	E34LP30
RUN	Black	E34SP31	E34LP31
SAFE	Black	E34SP85	E34LP85
SLOW	Black	E34SP32	E34LP32
SLOWER	Black	E34SP88	E34LP88
START	Black	E34SP33	E34LP33
STOP	Red	E34SP34	E34LP34
TEST	Black	E34SP83	E34LP83
TRANSFER	Black	E34SP93	E34LP93
TRIP	Black	E34SP84	E34LP84
UNCLAMP	Black	E34SP91	E34LP91
UP	Black	E34SP35	E34LP35

① 3/32" high lettering.



Standard



Jumbo

Table 2-306. For Selector Switch Operators

Legend	Colour of Field	Catalogue Number	
		Standard	Jumbo
2 Position — 3/16" High Lettering			
FOR. REV.	Black	E34SP38	E34LP38
HAND AUTO	Black	E34SP39	E34LP39
HIGH LOW	Black	E34SP40	E34LP40
JOG RUN	Black	E34SP41	E34LP41
MAN. AUTO	Black	E34SP67	E34LP67
OFF ON	Black	E34SP42	E34LP42
OPEN CLOSE	Black	E34SP43	E34LP43
RUN JOG	Black	E34SP44	E34LP44
SAFE RUN	Black	E34SP45	E34LP45
START JOG	Black	E34SP46	E34LP46
START STOP	Black	E34SP47	E34LP47
UP DOWN	Black	E34SP48	E34LP48

3 Position — 3/16" High Lettering

AUTO OFF HAND	Black	E34SP49	E34LP49
FOR. OFF REV.	Black	E34SP50	E34LP50
FOR. SAFE REV.	Black	E34SP69	E34LP69
HAND OFF AUTO	Black	E34SP51	E34LP51
MAN. OFF AUTO	Black	E34SP68	E34LP68
OPEN OFF CLOSE	Black	E34SP53	E34LP53
RUN SAFE JOG	Black	E34SP70	E34LP70
UP OFF DOWN	Black	E34SP54	E34LP54
ON STOP SAFE	Black	E34SP71	E34LP71

Table 2-307. For Push-Pull Units

Legend	Colour of Field	Catalogue Number	
		Standard ^②	Jumbo ^③
PULL ON/ PUSH OFF	Black	E34PP5	E34R5
PULL OPEN/ PUSH CLOSE	Black	E34PP8	E34R8
PULL UP/ PUSH DOWN	Black	E34PP11	E34R11

② 3/32 inch (2.4 mm) high lettering.
 ③ 1/8 inch (3.2 mm) high lettering.

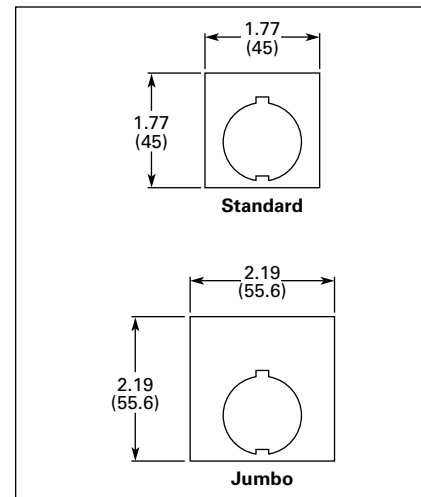


Figure 2-126. Approximate Dimensions in Inches (mm)

Table 2-308. Blank Plastic Legend Plates — Square

Colours			Catalogue Number		
Lettering	Field		Standard	Jumbo	Extra Large
	Side 1	Side 2			
Black	White	Silver	10250TSP76	10250TLP76	10250TEP76
White	Red	Black	10250TSP77	10250TLP77	10250TEP77

Legend Plates with Non-standard Markings or Aluminum Legend Plates




See 10250T listing on Page 2-151.

E34 Series, Enclosures

Enclosures

Die Cast, Polyester and Stainless Steel Enclosures

Table 2-309. Enclosures (Case and Cover) — Surface Mounting ①

	Number of Elements	1 Contact Block Depth	2 Contact Block Depth
		Catalogue Number	Catalogue Number
 Die Cast Enclosure — Cat. No. E34N11	Cast Enclosure — In-Line ②③ NEMA 4, 4X, 12, 13		
	1	E34N1	E34N11
	2	E34N2	E34N12
	3	E34N3	E34N13
	4	E34N4	E34N14
 Polyester Enclosure — Cat. No. E34N52	Polyester — In-Line NEMA 3, 4X, 12		
	1	—	E34N51
	2	—	E34N52
	3	—	E34N53
	4	—	E34N54
 Stainless Steel Enclosure — Cat. No. 10250TN35	Stainless Steel ④ — In-Line NEMA 4, 4X, 12		
	1	—	10250TN33
	2	—	10250TN34
	3	—	10250TN35
	4	—	10250TN36

① For spacing increments, see Page 2-185.

② All cast enclosures can be converted to base mounting of contact blocks, with spacers 10250TA22 or 10250TA23. See listing on Page 2-155.

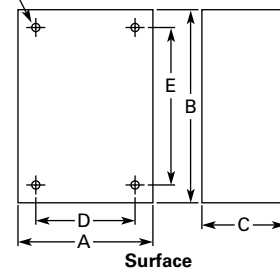
③ When used with E30 pushbuttons, only the one element enclosure can be used.

④ 14 gauge, type 304.

Table 2-310. Approximate Dimensions

Number of Elements	Element Arrangement	Surface Mounting					Conduit Entrance	Approximate Dimensions
		Dimensions in Inches (mm)						
		Wide A	High B	Deep C	Mounting			
					D	E		
Cast								
1	In-Line	3.88 (98.6)	4.0 (101.6)	3.0 (76.3) ⑥	2.69 (68.3)	3.25 (82.6)	3/4	
2	In-Line	3.88 (98.6)	5.88 (149.4)	3.0 (76.3) ⑥	2.69 (68.3)	5.13 (130.3)	3/4	
3	In-Line	3.88 (98.6)	7.75 (196.9)	3.0 (76.3) ⑥	2.69 (68.3)	7.0 (177.8)	1	
4	In-Line	3.88 (98.6)	9.63 (244.6)	3.0 (76.3) ⑥	2.69 (68.3)	8.88 (225.6)	1	
Polyester								
1	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	⑤	
2	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)		
3	In-Line	3.81 (96.8)	8.88 (225.6)	3.38 (85.9)	2.94 (74.7)	7.13 (181.1)		
4	In-Line	3.81 (96.8)	11.13 (282.7)	3.38 (85.9)	2.94 (74.7)	9.38 (238.3)		
Stainless Steel								
1	In-Line	3.00 (76.2)	3.50 (88.9)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)	⑤	
2	In-Line	3.50 (88.9)	6.75 (171.5)	3.00 (76.2)	1.50 (38.1)	7.50 (190.5)		
3	In-Line	3.50 (88.9)	9.00 (228.6)	3.00 (76.2)	1.50 (38.1)	9.00 (228.6)		
4	In-Line	3.50 (88.9)	11.25 (285.8)	3.00 (76.2)	1.50 (38.1)	12.00 (304.8)		

4 Mtg. Holes — 10-32 Screw Size for
 1 – 4 Element Die Cast/
 Stainless Steel Enclosure
 7/32 Screw Size for
 Polyester



⑤ No conduit entrance holes provided. Drill as required.

⑥ Depth given is for two contact block deep stations. One contact block deep stations subtract 3/4 inch (19.1 mm).

Note: These E34 Die Cast Enclosures feature a corrosion resistant coating identical to finish on the E34 operators except grey in colour. Not for use in ultraviolet light applications.



One Contact Block Depth Enclosure



Two Contact Block Depth Enclosure

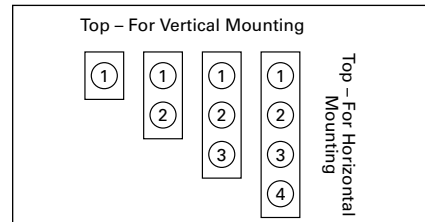


Figure 2-127. Enclosure Layouts

April 2009


E34 Series, Enclosures

Enclosures (Continued)

Die Cast and Stainless Steel — Flush Mount, Covers Only

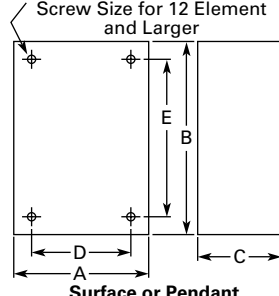
These E34 Die Cast Covers feature a corrosion resistant coating identical to the finish on the E34 operators except grey in colour.

Table 2-311. Covers Only — Flush Mounting

	Number of Elements	Catalogue Number	Catalogue Number
	Flush Cast Covers		
	1 2 3 4	In-Line Deep Cover	In-Line Flat Cover
		E34F11	E34F1
		E34F12	E34F2
		E34F13	E34F3
	1 2 3 4	In-Line Stainless Steel Flush Plates ①	
		With Pullbox	Without Pullbox
		10250TS10	10250TS1
		10250TS11	10250TS2
			10250TS12
		10250TS14	10250TS4

① Not oiltight. NEMA 1 applications only.

Table 2-312. Approximate Dimensions

Number of Elements	Flush Mounting					Approximate Dimensions
	Dimensions in Inches (mm)					
	Wide A	High B	Deep C	Mounting		
				D	E	
Cast						
1	3.88 (98.6)	4.0 (101.6)	0.25 (6.4) ②	3.50 (88.9)	3.63 (92.2)	
2	3.88 (98.6)	5.88 (149.4)	0.25 (6.4) ②	3.50 (88.9)	5.50 (139.7)	
3	3.88 (98.6)	7.75 (196.9)	0.25 (6.4) ②	3.50 (88.9)	6.0 (152.4)	
4	3.88 (98.6)	9.63 (244.6)	0.25 (6.4) ②	3.50 (88.9)	9.25 (235)	
Stainless Steel						
1	5.0 (127)	5.0 (127)	2.50 (63.5) ③	3.25 (82.6)	1.88 (47.8)	
2	5.0 (127)	6.88 (174.8)	2.50 (63.5) ③	3.25 (82.6)	3.63 (92.2)	
3	5.0 (127)	8.63 (219.2)	2.50 (63.5) ③	3.25 (82.6)	5.50 (139.7)	
4	5.0 (127)	10.50 (266.7)	2.50 (63.5) ③	3.25 (82.6)	7.25 (184.2)	

② Depth given is for flat cover. Deep cover 3/4 inch (19.1 mm) deeper.

③ Depth given includes pull box.

Table 2-313. Spacing Increments

Type	Approximate Dimensions in Inches (mm)		
	F	G	H
Cast	2.44 (62)	2.5 (63.5)	1.88 (47.8)
Polyester	1.88 (47.8)	Min. 2.13 (54.1)	2.25 (57.2)
Stainless Steel	1.69 (42.9)	Min. 1.73 (43.9)	2.25 (57.2)

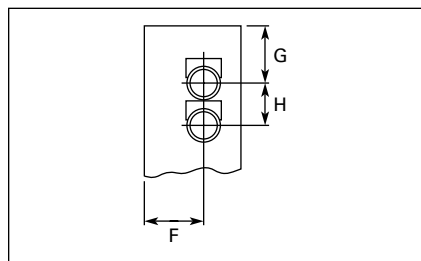


Figure 2-128. Spacing Increments for Enclosures

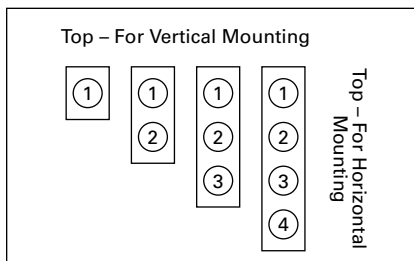

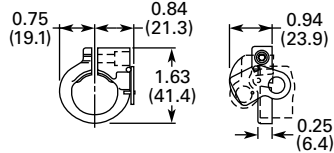



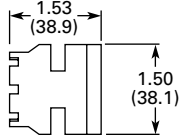

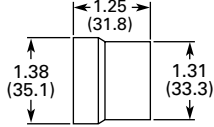

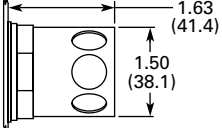



Figure 2-129. Enclosure Layouts

Accessories



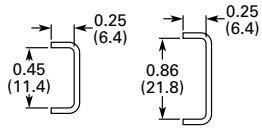

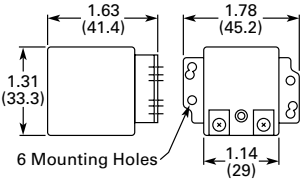


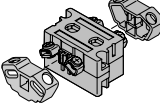
Table 2-314. Accessories

Description		Catalogue Number	Overall Dimensions in Inches (mm)
	Padlocking Attachment for Flush Pushbutton Operators. Permits locking NC contacts in open position with 1/4" padlock. Will not lock NO contact.	E34TA2	
	Flexible Weather Resistant Boot for use with flush pushbutton operators.	Clear Black Red Green	10250TA46 10250TA47 10250TA48 10250TA49
	Flexible Weather Resistant Boot for use with button operators (extended buttons preferred).	Black Red Green Clear	10250TA3 10250TA4 ① 10250TA10 10250TA85
	Transparent Boot for regular, illuminated pushbutton operators and PresTest.		10250TA25 ②
	Special Retaining Nut — to accommodate thick panel. Indicating light PresTest, pushbuttons and selector switches	E34TA30 E34TA31	
	Shroud for Mushroom Head Operator — prevents accidental operation. (Not for Push-Pull operators.)	E34TA6	
	Extended Retaining Nut — Replaces standard nut and provides guard for flush type pushbutton operators.	E34TA12	
	Guard for Illuminated Pushbutton	E34TA15	
	Padlocking Attachment for non-illuminated knob selector switches — accommodates up to 5, 1/4" padlocks.	E34TA11	

① Should not be used on flush button for STOP function.

② Not suitable for single contact block depth cast enclosure. Cover is too thick.

Table 2-314. Accessories (Continued)

Description	Catalogue Number	Overall Dimensions in Inches (mm)
 Thrust Washer — To meet Ford Motor Company mounting specifications.	E34TK3	
 Contact Block Terminal Jumps — Available in multiples of 100 only. Term. to Term. — Within Block (short): 100 per package 1000 per package Terminal to Terminal — Block to Block (long): 100 per package 1000 per package	10250TA70 10250TA70-2 10250TA71 10250TA71-2	
 Master Test (Dual Input) Module — Internal Form C relay suitable for either AC or DC applications. Total electrical isolation between monitored and test circuit. Fits all illuminated 10250T, E22, E30 and E34 devices. 24V AC 120V AC 24V DC 48V DC	10250TMT2 10250TMT1 10250TMT7 10250TMT8	
 Flasher Module — Internal Form C relay suitable for AC applications. One unit required for each operator in master test circuit. 24V AC 120V AC	10250TFL2 10250TFL1	
 Panel Mounting Nut Wrench — E22, E30, E34 and Octagonal 10250T.	E22CW	
 Fingerproof Shroud — 10 per Package Fits new style contact blocks and light units.	10250TA101	

2

Table 2-315. Replacement Lamps — For E34 Illuminated Operators

Mfg. Lamp Type	Voltage	Base Style	Application	Part Number
120MB	120V	T 3-1/4 Bayonet	10250T Resistor Indicating Light	28-3044
#267	6.3V	T 3-1/4 Bayonet	10250T Flasher	10250ED986-4 28-2202 28-5184 28-5185
#755	6.3V	T 3-1/4 Bayonet	10250T Transformer, PresTest and Full Voltage	
#756	12V	T 3-1/4 Bayonet	10250T Full Voltage	
#757	24V	T 3-1/4 Bayonet	10250T Full Voltage	
#1828	32V	T 3-1/4 Bayonet	10250T Full Voltage	28-5186
#1835	55V	T 3-1/4 Bayonet	10250T Resistor	28-5187
NE48	120V	T 4-1/2 Bayonet	10250T Neon	28-494
NE51H-R22	120V	T 3-1/4 Bayonet	10250T Neon	28-3754
NE51H-R68	240V	T 3-1/4 Bayonet	10250T Neon	28-3755

E34 Series, Renewal Parts

Renewal Parts



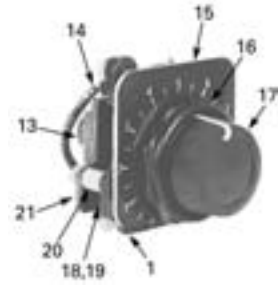
Flush Head Pushbutton Operator



Mushroom Head Pushbutton Operator



Jumbo Mushroom Head Operator



Potentiometers



Illuminated Pushbutton Operator



Transformer Type Indicating Light



Knob-Operated Selector Switch Operator



Full Voltage, Resistor and Transformer Type Illuminated Selector Switch

2

Table 2-316. Numbers Listed Are for E34 Style Operators

Item No.	Description	No. Req.	Part Number
1	Gasket	1	16-1548
2	Mounting Nut	1	15-1530-4
3	Set Screw (#6-32 x 0.250" Long Hollow Hex)	2	11-2014
4	Mushroom Head Button (Includes (2) Item 5) Black Red Yellow Green Blue	1 — — — — —	As Req. Below 53-1317 53-1317-2 53-1317-3 53-1317-4 53-1317-22
5	Set Screw (#10-32 x 0.250" Long Hollow Hex)	2	11-544
6	Jumbo Mushroom Head Button (Aluminum — Includes (2) Item 5) Red Black Yellow Green	1 — — — —	As Req. Below 53-1317-9 53-1317-10 53-1317-11 53-1317-12
7	Jumbo Mushroom Head Button (Aluminum — Red EMERG. STOP) Does Not Include Item 5	1	53-1349-18
8	Mounting Screw (#6-32 x 0.710" Long) Washer	2 2	10250TA79 16-2038
9	Terminal Screw and Lug (Captive)	Req.	80-5502
10	Gasket (Supplied with Basic Unit)	1	32-803
11	Round Head Screw (#4-40 x 0.344" Long) (Supplied with Basic Unit)	2	11-4553

Item No.	Description	No. Req.	Part Number
12	Mounting Screw	2	11-1632
13	Simple Potentiometer (Does Not Include Items 18, 28 or 29) 1,000 Ohms 2,500 Ohms 5,000 Ohms 10,000 Ohms 25,000 Ohms 50,000 Ohms	1 — — — — —	As Req. Below 41-782-2 41-782-3 41-782-10 41-782-4 41-782-5 41-782-6
14	Connector (Includes Screw and Lug)	2	25-1851
15	Indicating Plate Standard Size (Without Legend) Large Size (Specify Legend)	1 — —	As Req. Above 30-4460 10250TR30
16	Retaining Nut	1	15-1547-3
17	Knob Socket Set Screw (#6-32 x 0.250" Long)	1 1	53-1314 11-2014
18	Coupling	1 1	11-2014 29-3749-2
19	Set Screw (#6-32 x 0.188" Long)	1	11-1199
20	Spacer	2	56-1066-18
21	Connector (Includes Screw and Lug)	1	25-1851-2
22	Mounting Nut	1	15-1938-2

① Contact the Customer Support Centre at 1-800-268-3578.

E34 Series, Mounting Options

Mounting

Panel Thickness

- Minimum: 0.06 inch (1.6 mm)
- Maximum: 0.25 inch (8 mm) including legend plate
- Maximum can be increased to 0.375 inch (15.9 mm) using optional retaining nut
 - Indicating light: E34TA30
 - Pushbutton/selector switch: E34TA31

Table 2-317. Mounting Matrix

Legend Plate	Dimensions in Inches (mm)			
	A	B	C	D
Small	1.63 (41.3)	2.25 (57.2)	2.25 (57.2)	1.63 (41.3)
Medium	1.75 (44.5)	2.25 (57.2)	2.25 (57.2)	1.75 (44.5)
Large	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)

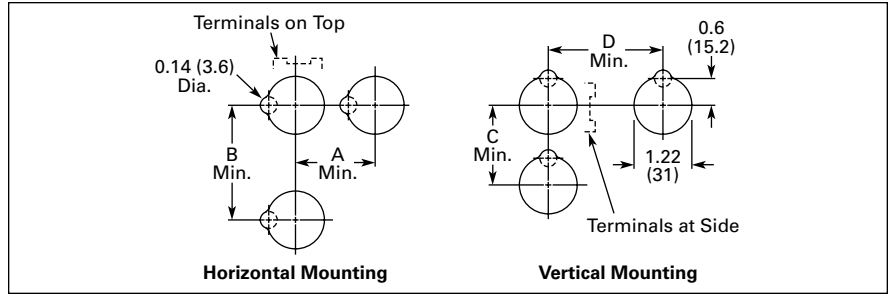


Figure 2-130. Mounting Options in Inches (mm)

Horizontal mounting means terminals are located top and bottom of contact block. Vertical mounting means terminals are left and right of contact block. This allows close spacing of adjacent operators with easy access to terminals.

Note: Locating nib hole or notch is 0.14 inch (3.6 mm)

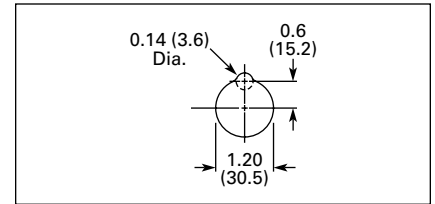


Figure 2-131. Drilling Dimensions in Inches (mm)

E34 Series, Dimensions

Dimensions

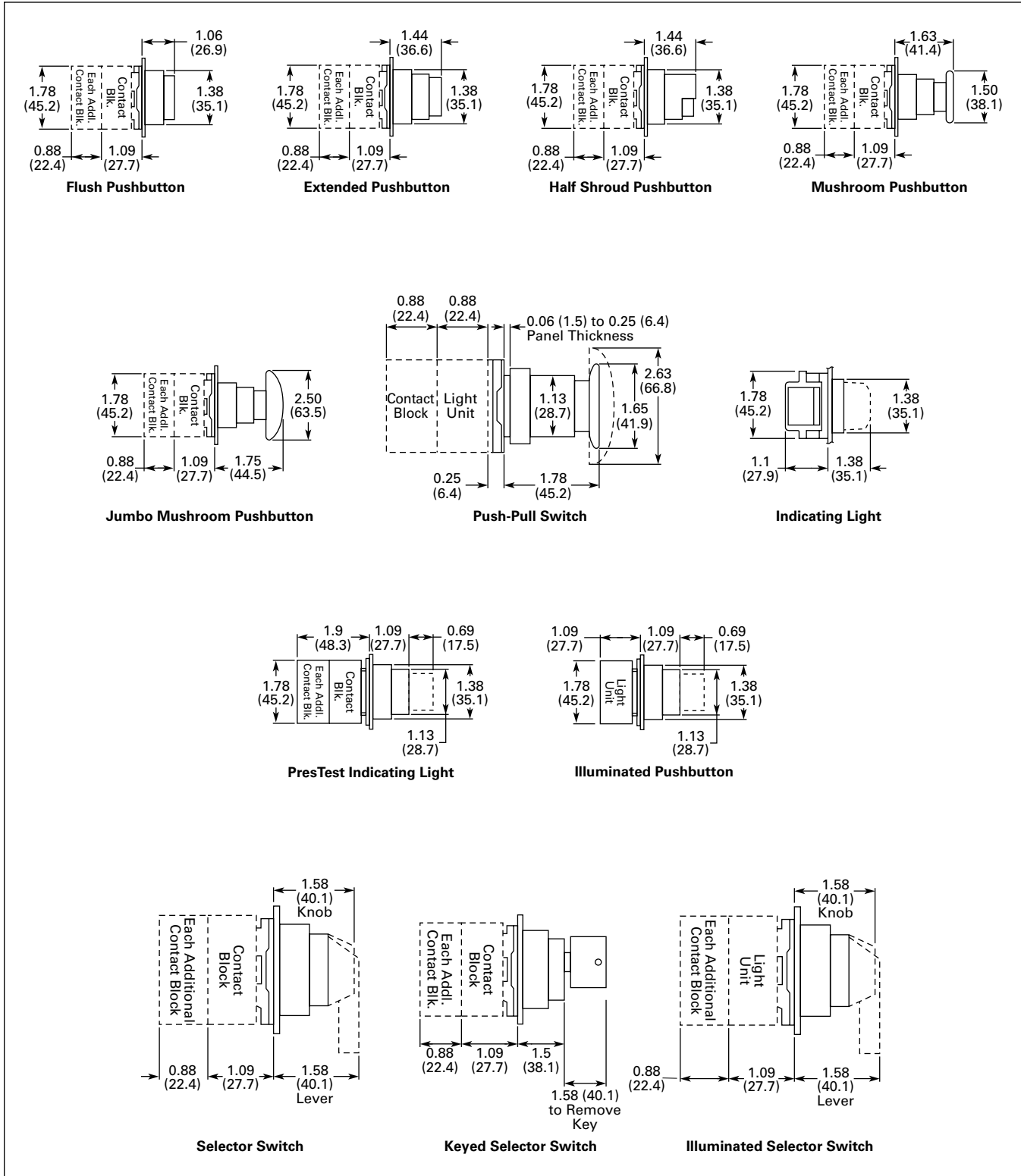


Figure 2-132. Approximate Dimensions in Inches (mm)

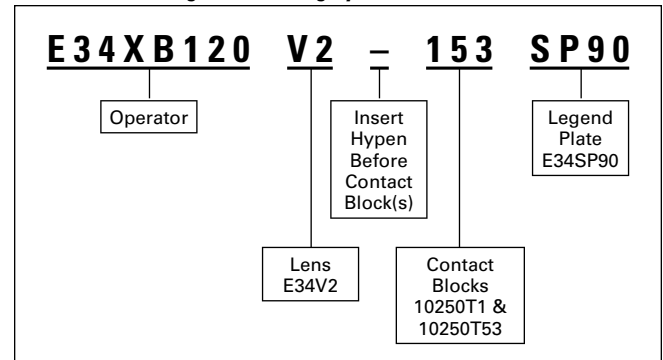
Ordering Complete Devices

Complete E34 Pushbuttons, Indicating Lights and/or Selector Switch operators including contact block(s) and legend plate can be ordered using a single composite catalogue number. The individually packaged components will be shipped unassembled in a single overpack carton marked with the composite Catalogue Number.

Ordering Example

Illuminated Pushbutton Device
Catalogue Number E34XB120V2-153SP90

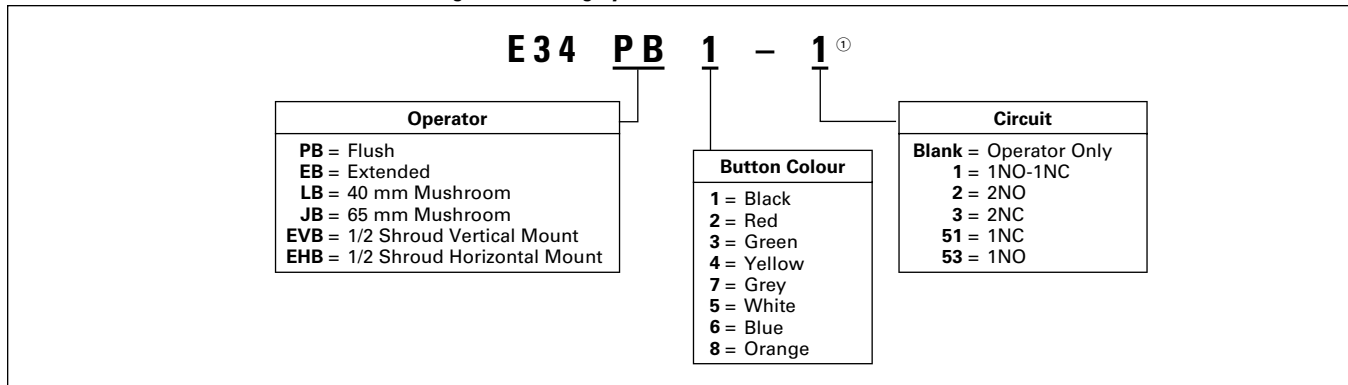
Table 2-318. Catalogue Numbering System



For a complete Catalogue Number breakdown, see **Pages 2-192 – 2-193.**

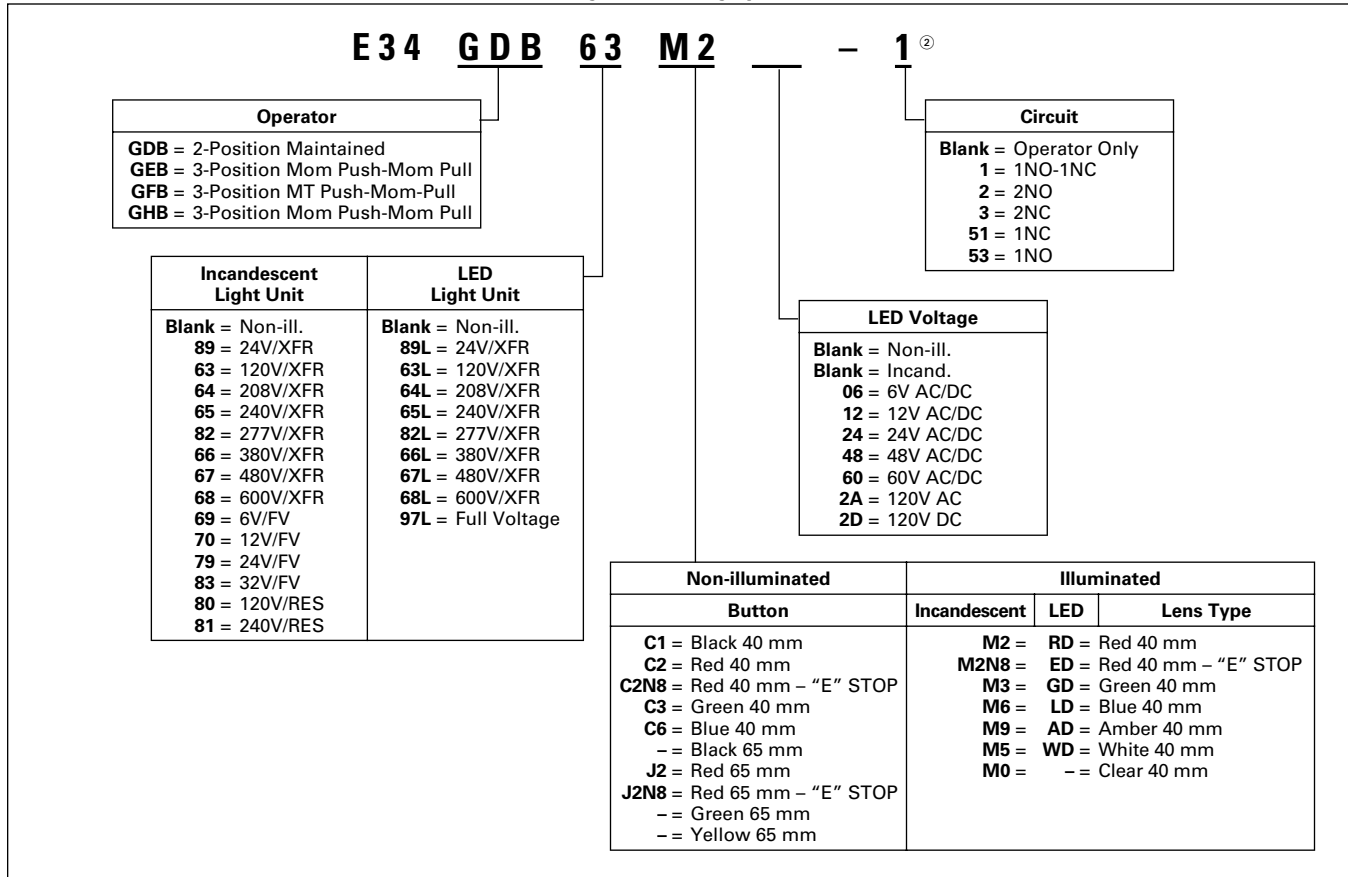
Catalogue Number Structure

Table 2-319. Non-illuminated Pushbuttons Catalogue Numbering System



① Add X at end of Catalogue Number to receive parts assembled from factory.

Table 2-320. Illuminated and Non-illuminated Push-Pulls Catalogue Numbering System

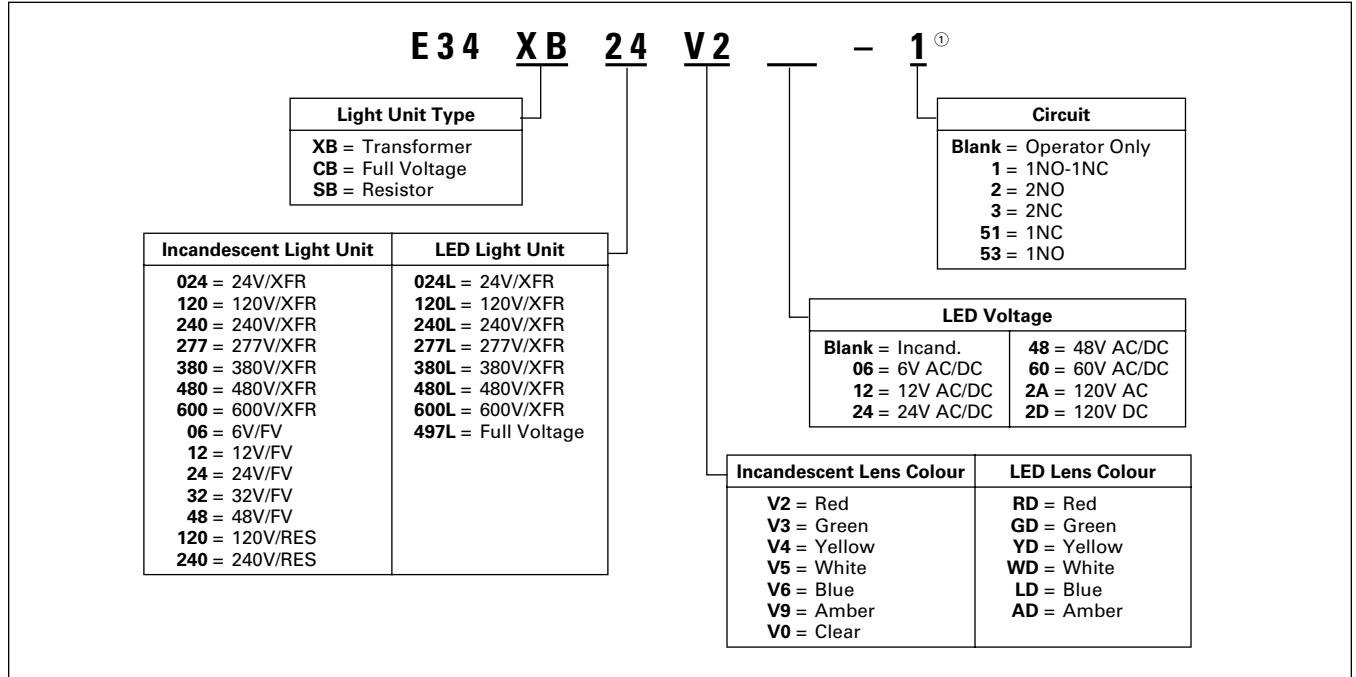


② Add X at end of Catalogue Number to receive parts assembled from factory.

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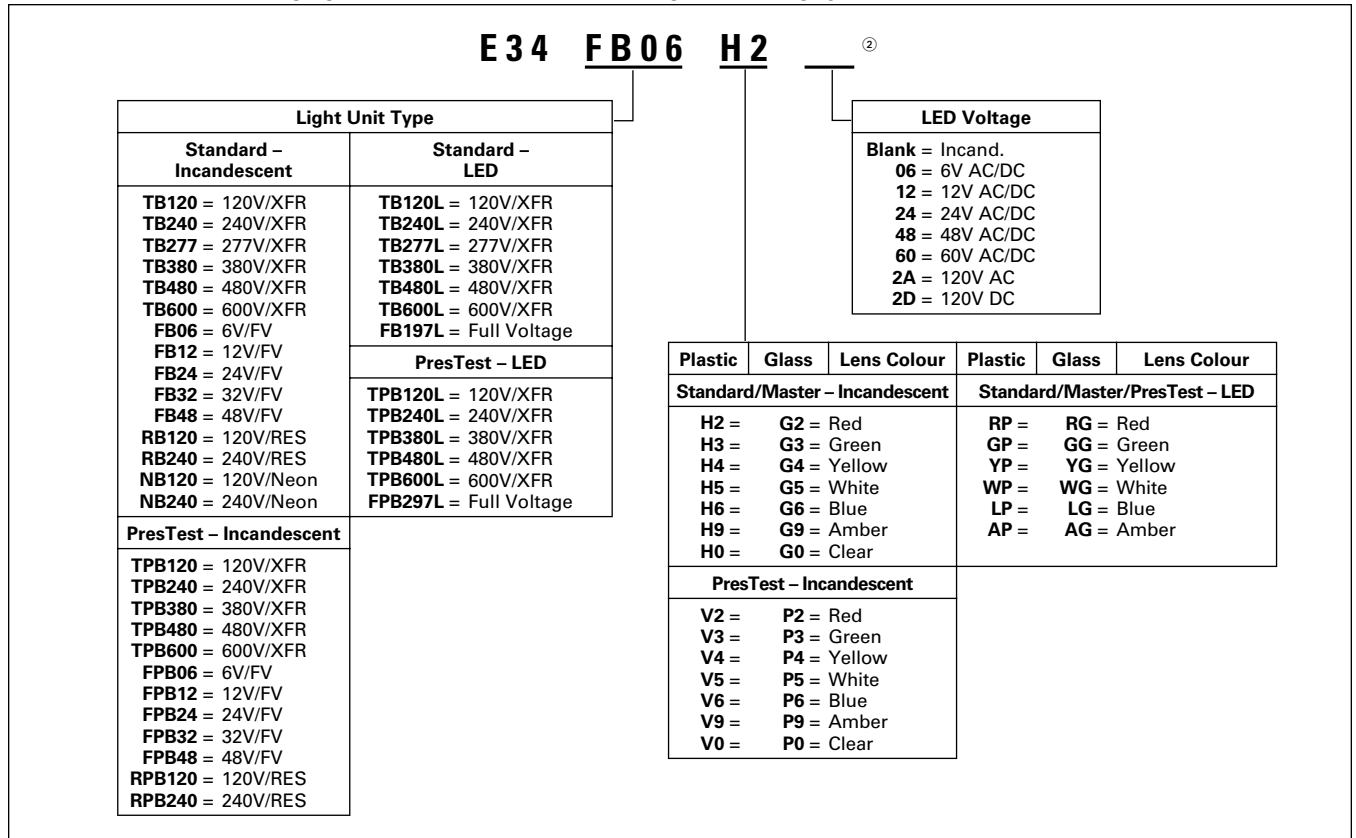
E34 Series, Catalogue Number Structure

Table 2-321. Illuminated Pushbuttons Catalogue Numbering System



① Add X at end of Catalogue Number to receive parts assembled from factory.

Table 2-322. Standard Indicating Lights, PresTest and Master Test Catalogue Numbering System



② Add X at end of Catalogue Number to receive parts assembled from factory.

10250T Heavy-Duty Oiltight and E34 Corrosion Resistant

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Product Description

All the Industry-Proven Quality of Eaton's Cutler-Hammer® 10250T and E34 Series of Logic Devices, plus Class I Division 2 Certification

The **10250T1H** consists of a normally open-normally closed factory sealed contact block that is UL Listed for use in Class I, Division 2, Groups B, C and D (NEC 500 – 503) – Class I, Zone 2, IIB + H₂ (NEC 505) hazardous locations and is rated for both NEMA A600 and NEMA Q300. 10250T and E34 illuminated components have also been UL Listed for use in Class I, Division 2, Groups B, C and D (NEC 500 – 503) – Class I, Zone 2, IIB + H₂ (NEC 505).

This, combined with the industry-proven Cutler-Hammer 10250T 30.5 mm pushbutton line, offers a complete solution to Division 2 hazardous location requirements.

Single composite catalogue numbers for complete assembled stations and operators for use in Division 2 hazardous locations are featured throughout this section.

Operator

The 30.5 mm 10250T pushbutton line features a zinc die cast construction with chrome-plated housing and mounting nut.

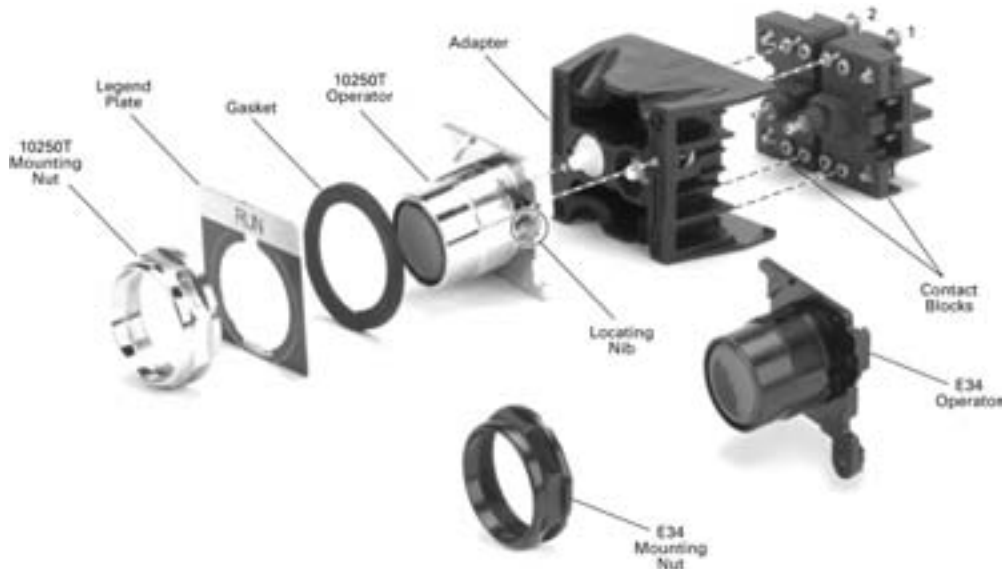
Eaton's Cutler-Hammer E34 Series 30.5 mm pushbutton line features the same rugged die cast construction of our 10250T line with an additional two-layer 100% solid thermosetting cathodic epoxy coating. This coating provides a flat black smooth, consistent, corrosion resistant surface that has passed a demanding 600 hour salt spray test. (The industry standard for this 4X test requires only 200 hours.)

Ultraviolet Light

E34 epoxy coating is not recommended for use in applications where exposure to ultraviolet light exists – use NEMA 4X 10250T operators.

Ratings

Our Class I Division 2 line of pushbuttons are UL Listed (NEMA type) 1, 2, 3, 3R, 4, 4X, 12 and 13. Our Class I Division 2 E34 line meets IEC 947-1 IP66 standards and the cathodic coating meets FDA 3A sanitary chemical resistance requirements. For a complete listing of all applicable ratings see **Page 2-196**.



Class I Division 2

Liquid Drainage

Eaton's Cutler-Hammer pushbutton operators offer front of panel drainage via holes in the operator bushing. Hidden from view by the mounting nut, these holes prevent buildup of liquid inside the operator, which can prevent operation in freezing environments. The holes also provide a route for escaping liquid in high pressure wash-downs, effectively relieving pressure from the internal diaphragm seal, ensuring reliable sealing in applications even beyond NEMA 4.

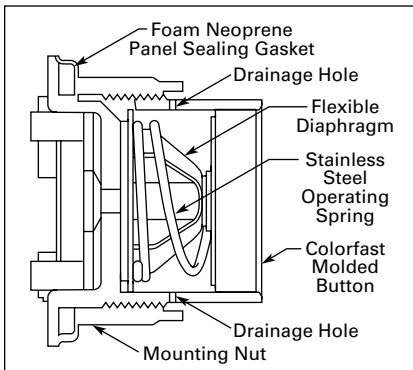


Figure 2-133. Diaphragm Seal

10250T Grounding

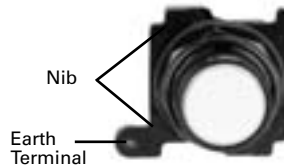
10250T line operators have "grounding nibs" — four metal points on the operator casting designed to bite through most paints and other coatings on metal panels to enhance the grounding connection when the operator is securely tightened.



10250T Grounding Nibs

E34 Grounding

E34 line of operators is equipped with a ground screw terminal as part of its die cast construction. This earthing terminal provides an easily accessible point for grounding operators when used in a painted or nonmetallic enclosure and eliminates the need for extra kits when daisy chain grounding is required.



E34 Grounding Nibs

Features

- Factory sealed contact blocks
- Heavy-duty zinc die cast construction
- NEMA rated 1, 2, 3, 3R, 4, 4X, 12, 13
- Front-of-panel drainage holes
- Grounding nibs on the operator casing
- Solid thermosetting cathodic epoxy coating on E34
- Corrosion resistance in E34

Benefits

- Pushbutton for hazardous locations
- Drainage holes prevent buildup of liquid inside the operator which can prevent operation in freezing environments
- Grounding nibs bite through paint and other coatings to provide secure ground
- Suitable for corrosive environments (E34 only)
- Earth terminal provides additional grounding point and allows for daisy chain grounding (E34 line)

Standards and Certifications

- UL 508 — File No. E131568
- UL 1604 — File No. E10323
- CSA Certified C22.2 No.14 File No. LR 68551
- CSA Certified C22.2 No. 213-M1987 — File No. LR 20713

Ingress Protection

- Standard Indicating Lights
 - NEMA 3, 3R, 3S, 4, 4X, 12, 13
 - IEC IP65
- All Other Operators
 - NEMA 3, 3R, 4, 4X, 12, 13
 - IEC IP65

Technical Data and Specifications

Mechanical Ratings

- Frequency of Operation
 - All pushbuttons: 6000 operations/hr.
 - Key and lever selector switches: 3000 operations/hr.
- Life
 - Pushbuttons: 10 x 10⁶ operations
 - Contact block: 10 x 10⁶ operations
 - Key and lever selector switches: 0.25 x 10⁶ operations
- Shock Resistance
 - Duration/force: 20 mS ≥5g

Climatic Conditions

- Operating: 32° to 140°F (0° to 60°C)
- Storage: -40° to 176°F (-40° to 80°C)
- Altitude: 6,562 ft. (2,000m)
- Humidity: Max. 95% RH @ 60°C

Terminals

Light Units

- Terminals are saddle clamp type for 1 x 22 AWG (0.34 sq. mm) to 2 x 14 AWG (4.0 sq. mm) conductors
- Torque = 7 lb-in (0.8 Nm)
- Degree of protection against direct electrical contact: IP2X with finger-proof shroud

Contact Blocks

- Terminals are Stainless Steel saddle clamp type for 1 x 18 – 14 AWG (0.75 – 2.5 sq. mm) solid or stranded copper conductor
- Torque = 9 lb-in (1.0 Nm) with size 2 Phillips screwdriver
- Degree of protection against direct electrical contact: IP2X with finger-proof shroud

Electrical Ratings

Table 2-323. Contact Block

Meet or Exceed NEMA Contact Rating Designations A600 and Q300						
Description	A600 (AC)				Q300 (DC)	
	120V	240V	480V	600V	125V	250V
Make and Emergency Interrupting Capacity (Amps)	60	30	15	12	0.55	0.27
Normal Load Break (Amps)	6	3	1.5	1.2	0.55	0.27
Thermal Current (Amps)	10	10	10	10	2.5	2.5
Voltamperes						
Max. Make	7200	7200	7200	7200	69	69
Max. Break	720	720	720	720	69	69

Light Units

- Bulbs — Average Life
 - Transformer type: 20,000 hrs.
 - Resistor/direct voltage type: 2,500 hrs. min. @ rated voltage
 - LED: 60,000 to 100,000 hrs.

Note: For additional technical information, see Pub. TD.74.TE.04.

All illuminated devices have operating temperatures below 100°C except for the following Catalogue Numbers with temperature codes per NEC table 500-5(d) and UL 1604:





Table 2-324. Temperature Codes

10250T	E34	Temp. Code
10250T201H	E34RB120H	T3C
10250T202H	E34RB240H	T3A
10250T471H	E34SB120H	TC3
10250T472H	E34SB240H	T3B
10250T80H	—	T3C
10250T81H	—	T3B
All Selector Switches w/120MB Lamp		T3C
All Illuminated Devices with Lamp 1835		T4A

Product Selection





Momentary Pushbutton Units

Table 2-325. Non-illuminated Flush and Extended Pushbuttons — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Contact Type	Button Colour ①	Flush Button		Extended Button	
		10250T	E34	10250T	E34
					
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
1NO-1NC	Black Red Green	10250T706 <u>B</u> 10250T706 <u>R</u> 10250T706 <u>G</u>	E34EX706 <u>B</u> E34EX706 <u>R</u> E34EX706 <u>G</u>	10250T708 <u>B</u> 10250T708 <u>R</u> 10250T708 <u>G</u>	E34EX708 <u>B</u> E34EX708 <u>R</u> E34EX708 <u>G</u>
2NO-2NC	Black Red Green	10250T707 <u>B</u> 10250T707 <u>R</u> 10250T707 <u>G</u>	E34EX707 <u>B</u> E34EX707 <u>R</u> E34EX707 <u>G</u>	10250T709 <u>B</u> 10250T709 <u>R</u> 10250T709 <u>G</u>	E34EX709 <u>B</u> E34EX709 <u>R</u> E34EX709 <u>G</u>

① To order different colour guarded button, simply substitute the underlined character in Catalogue Number with appropriate Suffix Code from Colour Selection Table below. Example: 10250T706Y

Table 2-326. Non-illuminated Mushroom and Jumbo Mushroom Pushbuttons — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Contact Type	Button Colour ②	Mushroom Button		Jumbo Mushroom Button	
		10250T	E34	10250T ③	E34 ③
					
		Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
1NO-1NC	Black Red Green	10250T710 <u>B</u> 10250T710 <u>R</u> 10250T710 <u>G</u>	E34EX710 <u>B</u> E34EX710 <u>R</u> E34EX710 <u>G</u>	10250T712 <u>B</u> 10250T712 <u>R</u> 10250T712 <u>G</u>	E34EX712 <u>B</u> E34EX712 <u>R</u> E34EX712 <u>G</u>
2NO-2NC	Black Red Green	10250T711 <u>B</u> 10250T711 <u>R</u> 10250T711 <u>G</u>	E34EX711 <u>B</u> E34EX711 <u>R</u> E34EX711 <u>G</u>	10250T713 <u>B</u> 10250T713 <u>R</u> 10250T713 <u>G</u>	E34EX713 <u>B</u> E34EX713 <u>R</u> E34EX713 <u>G</u>

② To order different colour guarded button, simply substitute the underlined character in Catalogue Number with appropriate Suffix Code from Colour Selection Table below. Example: 10250T710Y

③ Anodized aluminum head is not suitable for use in ultraviolet applications.

Table 2-327. Colour Selection Table

Colour	Suffix Code
Black	B
Red	R
Green	G
Yellow	Y
White	W
Blue	L ④
Orange ⑤	N
Red (EMERG. STOP) ⑥	E

④ Blue not available on Jumbo Mushroom Pushbutton.

⑤ Orange is only available on Flush or Extended Pushbuttons.

⑥ Red with EMERG. STOP engraved on button head for Jumbo Mushroom Pushbutton only.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.




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10250T/E34 Series, Assembled Devices — Momentary Pushbutton Units

Momentary Pushbutton Units (Continued)

- Momentary Contact
- Non-illuminated
- Booted or Guarded

Table 2-328. 10250T Pushbuttons Booted and Guarded — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D




Contact Type	Button Colour	Booted Flush Button	Booted Extended Button	Guarded Extended Button ②
				
		Catalogue Number	Catalogue Number	Catalogue Number
1NO-1NC	Black	10250T706BB	10250T708BB	10250T706BG
	Red	10250T706RB ①	10250T708RB	10250T706RG
	Green	10250T706GB	10250T708GB	10250T706GG
2NO-2NC	Black	10250T707BB	10250T709BB	10250T707BG
	Red	10250T707RB ①	10250T709RB	10250T707RG
	Green	10250T707GB	10250T709GB	10250T707GG

① Red Booted Flush Pushbutton is not recommended for STOP function.

② To order different colour guarded button, simply substitute the underlined character in Catalogue Number with appropriate Suffix Code from Colour Selection Table below. Example: 10250T706YG

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Table 2-329. E34 Pushbuttons Booted and Guarded — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Contact Type	Button Colour	Booted Flush Button	Booted Extended Button	Guarded Extended Button ④
				
		Catalogue Number	Catalogue Number	Catalogue Number
1NO-1NC	Black	E34EX706BB	E34EX708BB	E34EX706BG
	Red	E34EX706RB ③	E34EX708RB	E34EX706RG
	Green	E34EX706GB	E34EX708GB	E34EX706GG
2NO-2NC	Black	E34EX707BB	E34EX709BB	E34EX707BG
	Red	E34EX707RB ③	E34EX709RB	E34EX707RG
	Green	E34EX707GB	E34EX709GB	E34EX707GG

③ Red Booted Flush Pushbutton is not recommended for STOP function.

④ To order different colour guarded button, simply substitute the underlined character in Catalogue Number with appropriate Suffix Code from Colour Selection Table below. Example: 10250T706YG

Table 2-330. Colour Selection Table








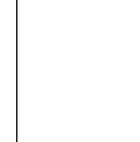
Colour	Suffix Code
Black	B
Red	R
Green	G
Yellow	Y
White	W
Blue	L
Orange	N

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.

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Pushbuttons

Table 2-331. Non-illuminated Pushbuttons, Momentary Contact — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Colour	Flush Button		Extended Button		Half Shrouded Button			
	10250T ①	E34	10250T	E34	10250T		E34	
								
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Vertical Catalogue Number	Horizontal Catalogue Number	Vertical Catalogue Number	Horizontal Catalogue Number
Black	10250T101	E34PB1	10250T111	E34EB1	10250T501	10250T511	E34EVB1	E34EHB1
Red	10250T102	E34PB2	10250T112	E34EB2	10250T502	10250T512	E34EVB2	E34EHB2
Green	10250T103	E34PB3	10250T113	E34EB3	10250T503	10250T513	E34EVB3	E34EHB3
Yellow	10250T104	E34PB4	10250T120	E34EB4	10250T504	10250T514	E34EVB4	E34EHB4
Grey	10250T105	E34PB5	—	E34EB5	10250T505	10250T515	E34EVB5	E34EHB5
White	10250T106	E34PB6	10250T116	E34EB6	10250T506	10250T516	E34EVB6	E34EHB6
Blue	10250T108	E34PB7	10250T118	E34EB7	10250T508	10250T518	E34EVB7	E34EHB7
Orange	10250T109	E34PB8	10250T119	E34EB8	10250T509	10250T519	E34EVB8	E34EHB8

① To order operator with factory assembled Extended Retaining Nut, 10250TA12, for thick panel applications, add Suffix letter **E** to listed Catalogue Number.

Table 2-332. Mushroom Head Non-illuminated Pushbuttons, Momentary Contact — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Colour	Mushroom Button		Anodized Aluminum Jumbo Mushroom Button	
	10250T	E34	10250T ②	E34 ③
				
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
Black	10250T121	E34LB1	10250T171	E34JB1
Red	10250T122	E34LB2	10250T172	E34JB2
Red (EMERG. STOP)	—	—	10250T17213	E34JB2N8
Green	10250T123	E34LB3	10250T173	E34JB3
Yellow	10250T124	E34LB4	10250T174	E34JB4
Blue	10250T129	E34LB6	—	—

② Anodized aluminum head is not suitable for use in ultraviolet light applications.

③ Anodized aluminum head may not be suitable for some corrosive environments.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.

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10250T/E34 Series, Assembled Devices — Illuminated Pushbutton Units

Illuminated Pushbutton Units



- Momentary Contact
- Illuminated
- Plastic Lenses

Table 2-333. Illuminated Pushbuttons — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Lamp	Type	Voltage	Colour	Contact	10250T		E34	
					Catalogue Number ①	LED/Lamp Number	Catalogue Number ①	LED/Lamp Number
LED	Full Voltage	24V AC/DC	Red Green Amber	1NO-1NC	10250T828RD24 10250T828GD24 10250T828AD24	Bayonet Base	E34EX828RD24 E34EX828GD24 E34EX828AD24	Bayonet Base
		120V AC	Red Green Amber	1NO-1NC	10250T828RD2A 10250T828GD2A 10250T828AD2A		E34EX828RD2A E34EX828GD2A E34EX828AD2A	
	Transformer	120V AC	Red Green Amber	1NO-1NC	10250T802RD06 10250T802GD06 10250T802AD06		E34EX802RD06 E34EX802GD06 E34EX802AD06	Bayonet Base 6V AC
Incandescent	Full Voltage	24V AC/DC	Red Green Amber	1NO-1NC	10250T818RD 10250T818GD 10250T818AD	#757	E34EX818RD E34EX818GD E34EX818AD	#757
		Resistor	120V AC/DC	Red Green Amber	1NO-1NC	10250T824RD 10250T824GD 10250T824AD	120MB	E34EX824RD E34EX824GD E34EX824AD
	Transformer	120V AC	Red Green Amber	1NO-1NC	10250T802RD 10250T802GD 10250T802AD	#755	E34EX802RD E34EX802GD E34EX802AD	#755 6V AC

① To order different colour lens, simply substitute the underlined character in the Catalogue Number with appropriate Suffix Code from Lenses Selection Table below. Example: 10250T828YD24

Table 2-334. Lenses Selection Table

10250T	Colour	Suffix Code	Catalogue Number	E34	Colour	Suffix Code	Catalogue Number
	Red Green Yellow Amber Blue Clear White	R G Y A L C W	10250TC21 10250TC22 10250TC23 10250TC43 10250TC24 10250TC25 10250TC26		Red Green Yellow Amber Blue Clear White	R G Y A L C W	E34V2 E34V3 E34V4 E34V9 E34V6 E34V0 E34V5

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10250T/E34 Series, Assembled Devices — Illuminated Pushbutton Units

Guarded Illuminated Pushbutton Units



- Momentary Contact
- Guarded Illuminated
- Plastic Lenses

Table 2-335. Guarded Illuminated Pushbuttons — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Lamp	Type	Voltage	Colour	Contact	10250T		E34	
					Catalogue Number ①	LED/Lamp Number	Catalogue Number ①	LED/Lamp Number
LED	Full Voltage	24V AC/DC	Red Green Amber	1NO-1NC	10250T828RG24 10250T828GG24 10250T828AG24	Bayonet Base	E34EX828RG24 E34EX828GG24 E34EX828AG24	Bayonet Base
		120V AC	Red Green Amber	1NO-1NC	10250T828RG2A 10250T828GG2A 10250T828AG2A			
	Transformer	120V AC	Red Green Amber	1NO-1NC	10250T802RG06 10250T802GG06 10250T802AG06			
Incandescent	Full Voltage	24V AC/DC	Red Green Amber	1NO-1NC	10250T818RG 10250T818GG 10250T818AG	#757	E34EX818RG E34EX818GG E34EX818AG	#757
		Resistor	120V AC/DC	Red Green Amber	1NO-1NC	10250T824RG 10250T824GG 10250T824AG	120MB	E34EX824RG E34EX824GG E34EX824AG
	Transformer	120V AC	Red Green Amber	1NO-1NC	10250T802RG 10250T802GG 10250T802AG	#755	E34EX802RG E34EX802GG E34EX802AG	#755 6V AC

① To order different colour lens, simply substitute the underlined character in the Catalogue Number with appropriate Suffix Code from Lenses Selection Table below. Example: 10250T828YG24

Table 2-336. Lenses Selection Table

10250T	Colour	Suffix Code	Catalogue Number	E34	Colour	Suffix Code	Catalogue Number
	Red Green Yellow Amber Blue Clear White	R G Y A L C W	10250TC21 10250TC22 10250TC23 10250TC43 10250TC24 10250TC25 10250TC26		Red Green Yellow Amber Blue Clear White	R G Y A L C W	E34V2 E34V3 E34V4 E34V9 E34V6 E34V0 E34V5



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10250T/E34 Series, Assembled Devices — Indicating Light Units

Indicating Light Units



- Standard
- Plastic Lens

Table 2-337. Indicating Lights — UL (NEMA) 3, 3R, 3S, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Lamp	Type	Voltage	Colour	10250T	E34	LED/Lamp Number
						
				Catalogue Number ①	Catalogue Number ①	
LED	Full Voltage	24V AC/DC	Red Green Amber	<u>10250T197HLRP24</u> <u>10250T197HLGP24</u> <u>10250T197HLAP24</u>	<u>E34FB197HLRP24</u> <u>E34FB197HLGP24</u> <u>E34FB197HLAP24</u>	Bayonet Base
		120V AC	Red Green Amber	<u>10250T197HLRP2A</u> <u>10250T197HLGP2A</u> <u>10250T197HLAP2A</u>	<u>E34FB197HLRP2A</u> <u>E34FB197HLGP2A</u> <u>E34FB197HLAP2A</u>	
	Transformer	120V AC	Red Green Amber	<u>10250T181HLRP06</u> <u>10250T181HLGP06</u> <u>10250T181HLAP06</u>	<u>E34TB120HLRP06</u> <u>E34TB120HLGP06</u> <u>E34TB120HLAP06</u>	
Incandescent	Full Voltage	24V AC/DC	Red Green Amber	<u>10250T206HRP</u> <u>10250T206HGP</u> <u>10250T206HAP</u>	<u>E34FB24HRP</u> <u>E34FB24HGP</u> <u>E34FB24HAP</u>	#757
	Resistor	120V AC/DC	Red Green Amber	<u>10250T201HRP</u> <u>10250T201HGP</u> <u>10250T201HAP</u>	<u>E34RB120HRP</u> <u>E34RB120HGP</u> <u>E34RB120HAP</u>	120MB
	Transformer	120V AC	Red Green Amber	<u>10250T181HRP</u> <u>10250T181HGP</u> <u>10250T181HAP</u>	<u>E34HB120HRP</u> <u>E34HB120HGP</u> <u>E34HB120HAP</u>	#755

① To order different colour lens, simply substitute the underlined characters in the Catalogue Number with appropriate Suffix Code from the Lenses Selection Table below. Example: 10250T201HYP

Table 2-338. Lenses Selection Table



	Colour	10250T				E34			
		Plastic		Glass		Plastic		Glass	
		Suffix Code	Catalogue Number	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number
 Plastic	Red	RP	10250TC1N	RG	10250TC7N	RP	E34H2	RG	E34G2
	Green	GP	10250TC2N	GG	10250TC8N	GP	E34H3	GG	E34G3
 Glass	Amber	AP	10250TC19N	AG	10250TC9N	AP	E34H9	AG	E34G9
	Yellow	YP	10250TC3N	—	—	YP	E34H4	YG	E34G4
	Blue	LP	10250TC4N	LG	10250TC10N	LP	E34H6	LG	E34G6
	Clear	CP	10250TC5N	CG	10250TC11N	CP	E34H0	CG	E34G0
	White	WP	10250TC6N	WG	10250TC12N	WP	E34H5	WG	E34G5

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.

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Illuminated Pushbuttons and Indicating Lights

Table 2-339. Operators without Lens — NEC Class I Division 2, Groups B, C and D

Light Unit Type	Type	Voltage	Illuminated Pushbutton		Indicating Light		LED/Lamp Number
			10250T 	E34 	10250T 	E34 	
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	
LED (LEDs not included) ①	Full Voltage	—	10250T397HL	E34CB497HL	10250T197HL	E34FB197HL	Bayonet Base
	Transformer AC Only	24	10250T416HL	E34XB024HL	—	—	
		120	10250T411HL	E34XB120HL	10250T181HL	E34TB120HL	
		240	10250T412HL	E34XB240HL	10250T182HL	E34TB240HL	
		277	10250T419HL	E34XB277HL	10250T198HL	E34TB277HL	
		380	10250T413HL	E34XB380HL	10250T183HL	E34TB380HL	
		480	10250T414HL	E34XB480HL	10250T184HL	E34TB480HL	
600	10250T415HL	E34XB600HL	10250T185HL	E34TB600HL			
Incandescent	Full Voltage AC/DC	6	10250T473H	E34CB06H	10250T203H	E34FB06H	#755
		12	10250T474H	E34CB12H	10250T204H	E34FB12H	#756
		24	10250T476H	E34CB24H	10250T206H	E34FB24H	#757
		32	10250T477H	E34CB32H	10250T207H	E34FB32H	#1828
		48	10250T478H	E34CB48H	10250T208H	E34FB48H	#1835
	Resistor ② AC/DC	120	10250T471H	E34SB120H	10250T201H	E34RB120H	120MB
		240	10250T472H	E34SB240H	10250T202H	E34RB240H	120MB
	Transformer AC Only	24	10250T416H	E34XB024H	—	—	#755
		120	10250T411H	E34XB120H	10250T181H	E34TB120H	
		240	10250T412H	E34XB240H	10250T182H	E34TB240H	
		277	10250T419H	E34XB277H	10250T198H	E34TB277H	
		380	10250T413H	E34XB380H	10250T183H	E34TB380H	
		480	10250T414H	E34XB480H	10250T184H	E34TB480H	
	Neon AC/DC	120	—	—	10250T226H	E34NB120H	NE51H-R-22
		240	—	—	10250T227H	E34NB240H	NE51H-4-68

① These units do not include lamps. Order LED separately to match lens colour from the LED Selection Table on Page 2-209.

② Resistor units are not available for use with LEDs, choose either transformer or full voltage LED style.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.

Table 2-340. Indicating Light Lenses




Plastic	Colour	10250T	E34	Glass	Colour	10250T	E34
		Catalogue Number	Catalogue Number			Catalogue Number	Catalogue Number
	Red Green Amber Yellow	10250TC1N	E34H2		Red Green Amber Yellow	10250TC7N	E34G2
		10250TC2N	E34H3			10250TC8N	E34G3
		10250TC19N	E34H9			10250TC9N	E34G9
		10250TC3N	E34H4			—	E34G4
		10250TC4N	E34H6			10250TC10N	E34G6
		10250TC5N	E34H0			10250TC11N	E34G0
	Blue Clear White	10250TC6N	E34H5	Blue Clear White	10250TC12N	E34G5	

Table 2-341. Illuminated Pushbutton Lenses

	Colour	10250T	E34
		Catalogue Number	Catalogue Number
	Red Green Yellow Amber Blue Clear White	10250TC21	E34V2
		10250TC22	E34V3
		10250TC23	E34V4
		10250TC43	E34V9
		10250TC24	E34V6
		10250TC25	E34V0
		10250TC26	E34V5

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10250T/E34 Series, Assembled Devices — Push-Pull Units

Push-Pull Units

- Two- and Three-Position
- Non-illuminated

Table 2-342. 2-Position Maintained Push, Maintained Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Function (Position) ①			Red Standard Push-Pull ②		Contact Type	Mounting Location ①	
Maintained (Pull)	Maintained (Push)		10250T	E34		1	2
			Catalogue Number	Catalogue Number			
O X	X O		<u>10250T714R</u>	<u>E34EX714R</u>	1NO 1NC		
O X O X	X O X O		<u>10250T715R</u>	<u>E34EX715R</u>	2NO 2NC		

① Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.

② To order different type or colour buttons, simply substitute underlined character with appropriate Suffix Code from the Button and Colour Selection Table below. Example: 10250T714G

Table 2-343. 3-Position Maintained Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Function (Position) ③			Red Standard Push-Pull ④		Contact Type	Mounting Location ③	
Momentary (Pull)	Maintained (Intermediate)	Maintained (Push)	10250T	E34		1	2
			Catalogue Number	Catalogue Number			
O X	O O	X O	<u>10250T716R</u>	<u>E34EX716R</u>	1NO 1NC		
X X	O X	O O	<u>10250T717R</u>	<u>E34EX717R</u>	1NC 1NC		

③ Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.

④ To order different type or colour buttons, simply substitute underlined character with appropriate Suffix Code from the Button and Colour Selection Table below. Example: 10250T716G

Table 2-344. 3-Position Momentary Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Function (Position) ⑤			Red Standard Push-Pull ⑥		Contact Type	Mounting Location ⑤	
Momentary (Pull)	Maintained (Intermediate)	Momentary (Push)	10250T	E34		1	2
			Catalogue Number	Catalogue Number			
O X	O O	X O	<u>10250T718R</u>	<u>E34EX718R</u>	1NO 1NC		
X X	O X	O O	<u>10250T721R</u>	<u>E34EX721R</u>	1NC 1NC		

⑤ Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.

⑥ To order different type or colour buttons, simply substitute underlined character with appropriate Suffix Code from the Button and Colour Selection Table below. Example: 10250T718G

Table 2-345. Button and Colour Selection Table

Standard	Colour	Suffix Code	Catalogue Number	Jumbo Mushroom Head (Anodized) Aluminum	Colour	Suffix Code	Catalogue Number
	Red Red (EMER. STOP) Green Black Blue	R E G B L	10250TB62 10250TB63 10250TB61 10250TB60 10250TB64		Red Red (EMER. STOP) Green Black Yellow	RJ EJ GJ BJ YJ	10250TJ62 10250TJ63 10250TJ61 10250TJ60 10250TJ64
			E34C2 E34C2N8 E34C3 E34C1 E34C6				E34J2 E34J2N8 — — —

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





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10250T/E34 Series, Assembled Devices — Illuminated Push-Pull Units

Illuminated Push-Pull Units

- Two-Position Maintained
- Illuminated

Table 2-346. 2-Position Illuminated Maintained Push, Maintained Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Position ①		Lamp	Type	Voltage	Red Standard Push-Pull ②		Contact Type	Mounting Location ①	
Maintained — Pull	Maintained — Push				10250T	E34		1	2
									
				Catalogue Number	Catalogue Number				
O X	X O	LED	Full Voltage	24V AC/DC	10250T853RD24	E34EX853RD24	1NO 1NC		
				120V AC	10250T853RD2A	E34EX853RD2A			
			Transformer	24V AC	10250T843RD06	E34EX843RD06			
				120V AC	10250T844RD06	E34EX844RD06			
O X	X O	Incan-descent	Full Voltage	24V AC/DC	10250T849RD	E34EX849RD	1NO 1NC		
				Resistor	120V AC/DC	10250T851RD			
			Transformer	24V AC	10250T843RD	E34EX843RD			
				120V AC	10250T844RD	E34EX844RD			

① Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.
 ② To order different type or colour lens, simply substitute the underlined characters with appropriate Suffix Code from the Lens and Colour Selection Table below. Example: 10250T851GS

Table 2-347. Lens and Colour Selection Table

Colour	10250T		E34	
	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number
Standard				
Red	RD	10250TC47	RD	E34M2
Red (EMER. STOP)	ED	10250TC53	ED	E34M2N8
Green	GD	10250TC48	GD	E34M3
Blue	LD	10250TC49	LD	E34M6
Amber	AD	10250TC50	AD	E34M9
White	WD	10250TC51	WD	E34M5
Clear	CD	10250TC52	CD	E34M0

Colour	10250T	
	Suffix Code	Catalogue Number

Side-Lighted (Anodized) Aluminum

Red	RS	10250TC57
Red (EMER. STOP)	ES	10250TC63
Green	GS	10250TC58
Blue	LS	10250TC59
Amber	AS	10250TC64
Yellow	YS	10250TC60
White	WS	10250TC61
Clear	CS	10250TC62

HD Alum. with Transparent Centre

Red	RH	10250TC65
Green	GH	10250TC66
Amber	AH	10250TC67



Standard



Side-Lighted (Anodized) Aluminum



HD Alum. with Transparent Centre

- Accessories **Pages 2-154 & 2-186**
- Additional Light Units **Page 2-203**
- Dimensions **Pages 2-218, 2-159 & 2-190**
- Enclosures **Page 2-219**
- Legend Plates **Pages 2-150 & 2-183**
- Replacement Lamps/LEDs **Page 2-156**

10250T/E34 Series, Assembled Devices — Illuminated Push-Pull Units

Illuminated Push-Pull Units (Continued)

- Three-Position — Maintained Push, Momentary Pull
- Illuminated

Table 2-348. 3-Position Illuminated Maintained Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Position ①			Lamp	Type	Voltage	Red Standard Push-Pull ②		Contact Type	Mounting Location ①	
Momentary — Pull	Maintained — Intermediate	Maintained — Push				10250T	E34		1	2
						Catalogue Number	Catalogue Number			
O X	O O	X O	LED	Full Voltage	24V AC/DC	10250T864RD24	E34EX864RD24	1NO 1NC		
					120V AC	10250T864RD2A	E34EX864RD2A			
				Transformer	24V AC	10250T854RD06	E34EX854RD06			
					120V AC	10250T855RD06	E34EX855RD06			
X X	O X	O O	LED	Full Voltage	24V AC/DC	10250T875RD24	E34EX875RD24	1NC 1NC		
					120V AC	10250T875RD2A	E34EX875RD2A			
				Transformer	24V AC	10250T865RD06	E34EX865RD06			
					120V AC	10250T866RD06	E34EX866RD06			
O X	O O	X O	Incandescent	Full Voltage	24V AC/DC	10250T860RD	E34EX860RD	1NO 1NC		
					Resistor	120V AC	10250T862RD			
				Transformer	24V AC	10250T854RD	E34EX854RD			
					120V AC	10250T855RD	E34EX855RD			
X X	O X	O O	Incandescent	Full Voltage	24V AC/DC	10250T871RD	E34EX871RD	1NC 1NC		
					Resistor	120V AC	10250T873RD			
				Transformer	24V AC	10250T865RD	E34EX865RD			
					120V AC	10250T866RD	E34EX866RD			

① Bolded circuit corresponds to "X-O" circuit selection. X = closed circuit, O = open circuit.

② To order different type or colour lens, simply substitute the underlined characters with appropriate Suffix Code from the Lens and Colour Selection Table on the bottom of **Page 2-205**. Example: 10250T862AS

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10250T/E34 Series, Assembled Devices — Illuminated Push-Pull Units

Illuminated Push-Pull Units (Continued)

- Three-Position Momentary
- Illuminated

Table 2-349. 3-Position Illuminated Momentary Push, Momentary Pull — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Position ①			Lamp	Type	Voltage	Red Standard Push-Pull ②		Contact Type	Mounting Location ①	
Momentary – Pull	Maintained – Intermediate	Maintained – Push				10250T	E34		1	2
						Catalogue Number	Catalogue Number		1	2
O X	O O	X O	LED	Full Voltage	24V AC/DC	10250T886RD24	E34EX886RD24	1NO 1NC		
					120V AC	10250T886RD2A	E34EX886RD2A			
				Transformer	24V AC	10250T876RD06	E34EX876RD06	1NO 1NC		
					120V AC	10250T877RD06	E34EX877RD06			
X X	O X	O O	LED	Full Voltage	24V AC/DC	10250T897RD24	E34EX897RD24	1NC 1NC		
					120V AC	10250T897RD2A	E34EX897RD2A			
				Transformer	24V AC	10250T887RD06	E34EX887RD06	1NC 1NC		
					120V AC	10250T888RD06	E34EX888RD06			
O X	O O	X O	Incandescent	Full Voltage	24V AC/DC	10250T882RD	E34EX882RD	1NO 1NC		
					Resistor	120V AC	10250T884RD			
				Transformer	24V AC	10250T876RD	E34EX876RD	1NO 1NC		
					120V AC	10250T877RD	E34EX877RD			
X X	O X	O O	Incandescent	Full Voltage	24V AC/DC	10250T893RD	E34EX893RD	1NC 1NC		
					Resistor	120V AC	10250T895RD			
				Transformer	24V AC	10250T887RD	E34EX887RD	1NC 1NC		
					120V AC	10250T888RD	E34EX888RD			

① Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.
 ② To order different type or colour lens, simply substitute the underlined characters with appropriate Suffix Code from the Lens and Colour Selection Table on the bottom of **Page 2-205**. Example: 10250T884GD

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2

10250T/E34 Series, Push-Pull Components

Push-Pull Operators

An illuminated Push-Pull pushbutton unit, arranged for one-hole mounting, can replace two pushbuttons and a pilot light or the non-illuminated form can replace two pushbuttons. These units are available in three basic types:

- **Maintained** — (Two-Position). Maintains in the pulled or pushed position until manually actuated to the opposite mode.
- **Momentary** — (Three-Position). Spring returns to an intermediate position when pulled or pushed and released.
- **Momentary Pull, Maintained Push** — (Three-Position). Spring returns to intermediate position when pulled. Maintains in pushed position until manually returned to intermediate (ready to reset) position. Maintained stop holds circuit open and will prevent other series connected operators from starting the system.

The Operators, Buttons, Contact Blocks, etc., are offered as building block components that can be intermixed to satisfy many requirements. This minimizes the need for a varied and costly inventory.

Application Guide

To assist in the selection of contact blocks, the sketch to the right shows pictorially by symbols **1** and **2** locations of contact circuits after assembly of contact blocks and adapter to the operator. The chart below shows the effect of the push and pull operations on either NO or NC contacts. (X = contact closed, O = contact open)



2-Position Maintained Push-Pull without Button on Lens
 Catalogue Number E34GDB



2-Position Maintained Push-Pull without Button on Lens
 Catalogue Number 10250T5

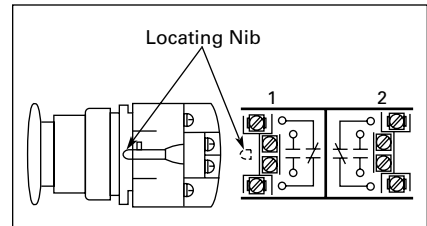


Figure 2-134. Locating Nibs

Table 2-350. Push-Pull Operator Components

Type of Operator	10250T Catalogue Number	E34 Catalogue Number	Contact Block	Operator Position and Circuit Arrangement						
				Out — Pull		Intermediate		In — Push		
				Contact Block Mounting Location						
				1	2	1	2	1	2	
2-Position Operator without Lens										
Maintained Push-Pull	10250T5	E34GDB	1NO 1NC	O or X	O or X	No Intermediate Position		X or O	X or O	
			2NO 2NC	O or X	O or X			X or O	X or O	
3-Position Operator without Lens										
Momentary Push-Pull	10250T4	E34GEB	1NO 1NC	O or X	O or X	O or O		X or O	X or O	
Maintained Push-Momentary Pull	10250T9	E34GFB	2NO 2NC	O or X	O or X	O or O		X or O	O or O	
Momentary Push-Pull	10250T10	E34GHB	1NO 1NC	O or X	O or X	O or O		X or O	X or O	
			2NO 2NC	O or X	O or X	O or O		X or O	X or O	

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.

Button or Lens Page 2-209
 Contact Blocks Page 2-218
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10250T/E34 Series, Push-Pull Components

Push-Pull Operators (Continued)

Push-Pull Light Units, Lens and Buttons

Table 2-351. Light Units for Illuminated Push-Pull Devices — NEC Class I Division 2 Groups B, C and D

Light Unit Type	Type	Voltage	Catalogue Number	LED/Lamp Number
LED (LEDs not included) ①	Full Voltage	—	10250T97HL	Bayonet Base
	Transformer AC Only 50/60 Hz	24	10250T89HL	
		120	10250T63HL	
		208	10250T64HL	
		240	10250T65HL	
		277	10250T82HL	
		380	10250T66HL	
		480	10250T67HL	
		600	10250T68HL	
		Incandescent	Full Voltage AC or DC	
12	10250T70H			#756
24/28	10250T79H			#757
32	10250T83H			#1828
Resistor AC or DC	120			10250T80H
240	10250T81H			
Transformer AC Only 50/60 Hz	24		10250T89H	#755
	120		10250T63H	
	208		10250T64H	
	240		10250T65H	
	277		10250T82H	
	380		10250T66H	
	480		10250T67H	
	600		10250T68H	

① These units do not include lamps. Order LED separately to match lens colour from Table 2-354.

Table 2-352. Alternate Lenses for Illuminated Push-Pull Devices

Colour	10250T	E34
	Catalogue Number	Catalogue Number
Standard		
Red	10250TC47	E34M2
Red (EMER. STOP)	10250TC53	E34M2N8
Green	10250TC48	E34M3
Blue	10250TC49	E34M6
Amber	10250TC50	E34M9
White	10250TC51	E34M5
Clear	10250TC52	E34M0
Side-Lighted Anodized Aluminum Ring		
Red	10250TC57	—
Red (EMER. STOP)	10250TC63	—
Green	10250TC58	—
Blue	10250TC59	—
Amber	10250TC64	—
Yellow	10250TC60	—
White	10250TC61	—
Clear	10250TC62	—
Heavy-Duty Aluminum with Transparent Centre		
Red	10250TC65	—
Green	10250TC66	—
Amber	10250TC67	—

Table 2-353. Buttons for Non-illuminated Push-Pull Devices

Colour	10250T	E34
	Catalogue Number	Catalogue Number
Standard		
Red	10250TB62	E34C2
Red (EMER. STOP)	10250TB63	E34C2N8
Green	10250TB61	E34C3
Black	10250TB60	E34C1
Blue	10250TB64	E34C6

Table 2-353. Buttons for Non-illuminated Push-Pull Devices (Continued)

Colour	10250T	E34
	Catalogue Number	Catalogue Number
Jumbo Mushroom Head (Anodized) Aluminum ②		
Red	10250TJ62	E34J2
Red (EMER. STOP)	10250TJ63	E34J2N8
Green	10250TJ61	—
Black	10250TJ60	—
Yellow	10250TJ64	—

② Anodized aluminum head is not suitable for use with ultraviolet light applications.

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light.

Table 2-354. LED Selection Table

Voltage	Colour	Catalogue Number
6-12V AC/DC Suitable for Use with Transformers	Red	E22LED612RN
	Orange	E22LED612ON
	Yellow	E22LED612YN
	Green	E22LED612GN
	Blue	E22LED612BN
24V AC/DC	White	E22LED612WN
	Red	E22LED024RN
	Orange	E22LED024ON
	Yellow	E22LED024YN
	Green	E22LED024GN
48V AC/DC	Blue	E22LED024BN
	White	E22LED024WN
	Red	E22LED048RN
	Orange	E22LED048ON
	Yellow	E22LED048YN
60V AC/DC	Green	E22LED048GN
	Blue	E22LED048BN
	White	E22LED048WN
	Red	E22LED060RN
	Orange	E22LED060ON
120V AC/DC	Yellow	E22LED060YN
	Green	E22LED060GN
	Blue	E22LED060BN
	White	E22LED060WN
	Red	E22LED120RN
	Orange	E22LED120ON
	Yellow	E22LED120YN
	Green	E22LED120GN
	Blue	E22LED120BN
	White	E22LED120WN

For a complete listing of all LEDs available, see Page 2-156.










Accessories Pages 2-154 & 2-186
 Contact Blocks Page 2-218
 Dimensions Pages 2-159 & 2-190
 Enclosures Page 2-219
 Legend Plates Pages 2-150 & 2-183
 Replacement Lamps/LEDs Page 2-156

10250T/E34 Series, Assembled Devices — Selector Switch Units

Selector Switch Units

- Two- and Three-Position
- Non-illuminated

Table 2-355. 2-Position Selector Switch — Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D








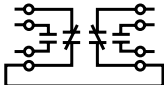



Operator Position ^①		Operator Action ^②	Black Knob — Selector Switch ^③		Contact Type	Mounting Location ^④		Cam Code
			10250T	E34		1	2	
								
			Catalogue Number	Catalogue Number				
X O	O X	M 	<u>10250T722BK</u>	<u>E34EX722BK</u>	1NC 1NO			1
		M 	<u>10250T724BK</u>	<u>E34EX724BK</u>				
X O X O	O X O X	M 	<u>10250T723BK</u>	<u>E34EX723BK</u>	1NC 1NO 1NC 1NO			1
		M 	<u>10250T725BK</u>	<u>E34EX725BK</u>				

① Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.

② M = Maintained. S = Spring return in direction of arrow (→).

③ To order different type or colour selector switch, simply substitute the underlined characters with appropriate Suffix Code from the table on **Page 2-211**. Example: 10250T722LL. For keyed selector switch, substitute the underlined characters with T_ (cam)+_ (key removal position). Example: 10250T722T13

Table 2-356. 3-Position Selector Switch — Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Position ^④			Operator Action ^⑤	Black Knob — Selector Switch ^⑥		Contact Type	Mounting Location ^④		Cam Code
				10250T	E34		1	2	
				Catalogue Number	Catalogue Number				
X O	O O	O X	M 	<u>10250T726BK</u>	<u>E34EX726BK</u>	1NO 1NO			3
			S 	<u>10250T728BK</u>	<u>E34EX728BK</u>				
			S 	<u>10250T730BK</u>	<u>E34EX730BK</u>				
			M 	<u>10250T732BK</u>	<u>E34EX732BK</u>				
X O O	O X O	O O X	M 	<u>10250T727BK</u>	<u>E34EX727BK</u>	1NO 1NC-1NC (Series) 1NO			3
			S 	<u>10250T729BK</u>	<u>E34EX729BK</u>				
			S 	<u>10250T731BK</u>	<u>E34EX731BK</u>				
			M 	<u>10250T733BK</u>	<u>E34EX733BK</u>				

④ Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.

⑤ M = Maintained. S = Spring return in direction of arrow (→).

⑥ To order different type or colour selector switch, simply substitute the underlined characters with appropriate Suffix Code from the Switch and Colour Selection Table on **Page 2-211**. Example: 10250T726LL. For keyed selector switch, substitute the underlined characters with T_ (cam)+_ (key removal position). Example: 10250T726T13

- Accessories **Pages 2-154 & 2-186**
- Additional Circuit Arrangements . **Pages 2-212 – 2-213**
- Dimensions **Pages 2-218, 2-159 & 2-190**
- Enclosures **Page 2-219**
- Legend Plates **Pages 2-150 & 2-183**

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10250T/E34 Series, Assembled Devices — Selector Switch Units

Selector Switch Units (Continued)

- Four-Position Maintained
- Non-illuminated

Table 2-357. 4-Position Selector Switch — Non-illuminated — UL (NEMA) 3, 3R, 4, 4X, 12, 13, NEC Class I Division 2, Groups B, C and D

Operator Position ①				Operator Action ②	Black Knob — Selector Switch ③		Contact Type	Mounting Location ①		Cam Code
					10250T	E34		1	2	
X	O	O	O		10250T743BK	E34EX743BK	1NC 1NO 1NO 1NC		7	
O	X	O	O							
O	O	X	O							
O	O	O	X							

① Bolded circuit corresponds to “X-O” circuit selection. X = closed circuit, O = open circuit.

② M = Maintained.

③ To order different type or colour selector switch, simply substitute the underlined characters with appropriate Suffix Code from the Switch and Colour Selection Table below.

Example: 10250T743LL. For keyed selector switch, substitute the underlined characters with T_ (cam) + _ (key removal position). Example: 10250T743T77

Table 2-358. Switch and Colour Selection Table

Colour	Knob	Lever	Lever ④	Coin Slot ⑤
	Suffix Code	Suffix Code	Suffix Code	Suffix Code
Black	BK	BL	BA	BC
Red	RK	RL	RA	RC
Green	GK	GL	GA	GC
Yellow	YK	YL	YA	YC
White	WK	WL	WA	WC
Grey	AK	AL	AA	AC
Blue	LK	LL	LA	LC
Orange	NK	NL	NA	NC

④ Designed for added ingress protection. For use in maintained operators only.

⑤ 10250T only.

Table 2-359. Key Operated Selection Table

Number of Position	Operator Action ⑥	Suffix and Removal Positions
2	M M M ← S	T1 + 1, 2, 3 T1 + 2
3	M M M S → M M S → M ← S M M ← S	T3 + 1 – 7 T3 + 1, 4, 5 T3 + 4 T3 + 2, 4, 6
4	MMMM	T7 + 7

⑥ M = Maintained. S = Spring return in direction of arrow (→).

Table 2-360. Key Removal Positions

Code Suffix	Key Removal Positions	Code Suffix	Key Removal Positions
1	Right Only	5	Right & Centre
2	Left Only	6	Left & Centre
3	Right & Left	7	All Positions
4	Centre Only		

Note: Key removal in “spring return from” positions not recommended.

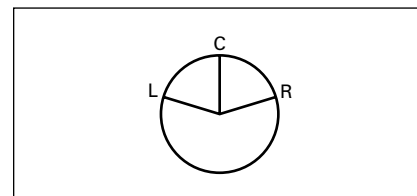


Figure 2-135. Key Removal Positions

- Accessories **Pages 2-154 & 2-186**
- Additional Circuit Arrangements **Pages 2-212 – 2-213**
- Dimensions **Pages 2-218, 2-159 & 2-190**
- Enclosures **Page 2-219**
- Legend Plates **Pages 2-150 & 2-183**

10250T/E34 Series, Selector Switch Selection



Selector Switch Selection

Cam and Contact Block Selection

Selector switches in their varied forms (2-position, 3-position, and 4-position) are a big factor contributing to the great flexibility of control that a well rounded line of “pushbuttons” can achieve. Because of their flexibility, they tend to cause difficulty with product selection and application. The following systematic approach should simplify that task.

Cam and contact block selection is better understood if you:

- Work with each incoming and outgoing wire/circuit separately.
- Recognize the terms NO and NC only identify the type of contact by its mode before mounting to the operator. The “X-O” table (Page 2-213) shows how that contact will act after assembly to the operator with the selected cam shape. X = closed circuit, O = open circuit.
- One NO-NC contact block may be mounted behind each plunger of the mounting adapter for a total of four circuits.
- Each cam has two separate lobes, each of which operates one of the two contact block plungers independently of each other. Those are identified as position 1 (locating nib side) and position 2 (opposite of locating nib). The position designations give direction in selecting and mounting of the contact blocks (see Figure 2-136).

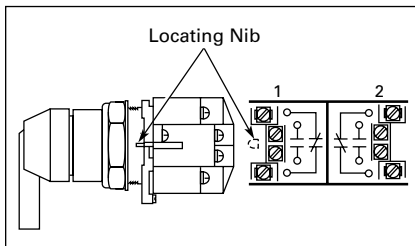


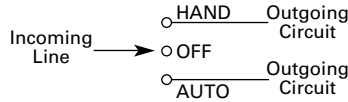
Figure 2-136. Contact Circuit Locations

Systematic Approach

Application: **HAND-OFF-AUTO** Selector Switch. In this circuit, one incoming line is distributed to two other outgoing circuits by the switch. The two circuits can be looked at individually.

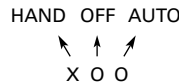
Step 1: Elementary Diagram.

Construct on paper, or in your mind, a simple elementary diagram of the switching scheme as follows:



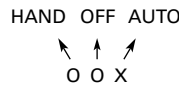
Step 2: “X-O” Pattern.

From the elementary diagram, you can construct an “X-O” diagram which describes when the contacts are to be closed (X) or open (O) in the various positions of the switch. The “X-O” for the **HAND** circuit looks like this:



In this circuit, you want a contact closed on the left (HAND) but open in the centre and right.

For the **AUTO** circuit, the “X-O” diagram would look like this:



Putting them together, the complete “X-O” diagram is:



Once the “X-O” diagram has been generated, the next step is to select the cam and contact block, or blocks, needed to perform the desired “X-O” functions. The selection table on the following page lists the various types (shapes) of cams by number to choose from and the type of contact and position to achieve the function outlined in your “X-O” diagram.

Step 3: Cam Selection.

The cam you select determines the operation of all contact blocks mounted to the operator. It is selected on the basis that it provides the simplest circuitry for the desired “X-O” diagram. The selection tables of the following page show all the “X-O” combinations. For the purpose of this example, the applicable portion of those tables is shown in Table 2-361.

Table 2-361. Example Selection Table

No.	Desired Circuit & Operator Position	Cam Code #2		Cam Code #3	
		Contact Blocks & Mounting Location	Contact Blocks & Mounting Location	Contact Blocks & Mounting Location	Contact Blocks & Mounting Location
		1	2	1	2
1	X O O				
4	O O X				

① Wired in series.

Now to make the cam selection, make a simple worksheet such as below. (1) or (2) = mounting location from chart above:

	Cam 2	Cam 3
X O O	(1)NO – (2)NC ①	(1)NO
O O X	(2)NC	(2)NO

It becomes obvious that cam 3 is the better choice because the series connection can be avoided, making it simpler to wire.

Step 4: Contact Block Selection.

Having selected the cam, contact block selection is simply a matter of determining if you require one NO-NC contact block (Cat. No 10250T1H) or two. Given the limitations of the factory sealed contact block and the desired “X-O” application, you may have circuits that will not be needed — as seen here with the two additional NC circuits. (1) or (2) = mounting location from chart above.

Qty	Catalogue No.	Cam 3
2	10250TIH	(1)NO (2)NC (1)NC (2)NO

Step 5: Selector Switch Operator.

Lastly, you have to choose from the many types of operators — knob and lever in various colours or keyed. Also what combinations of maintained and spring return functions are required. Selection of these operators can be found on Page 2-214. For the above example you may want a 3-position maintained black knob, cam 3 — Catalogue Number 10250T1323 (or 34VHBK1).

The Complete Switch: 10250T1323 (or 34VHBK1) with two 10250T1H or for one composite catalogue number — 10250T726BK (or E34EX726BK) found on Page 2-210.

April 2009

10250T/E34 Series, Selector Switch Selection

Selector Switch Selection (Continued)

Circuits shown illustrate connections to obtain a selector circuit combination and are shown with their appropriate line diagrams in **BOLD**. Field wiring of jumper connections required as shown.

X = Closed Circuit, O = Open Circuit

Table 2-362. 2-Position Selector Switch



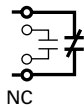
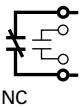
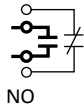
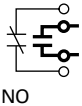
Number	Desired Circuit and Operator Position	Cam Code #1	
		Contact Blocks and Mounting Location	
	 	1	2
1	X O	 NC	 NC
2	O X	 NO	 NO

Table 2-363. 3-Position Selector Switch





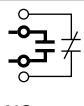
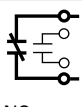
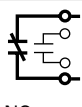
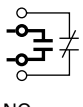
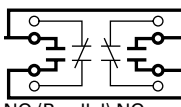
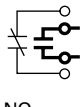
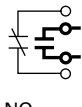

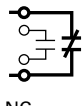
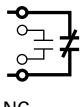
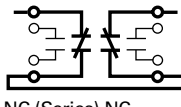




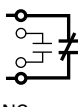
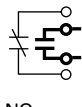
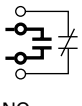
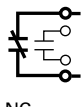
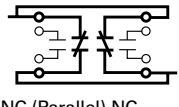
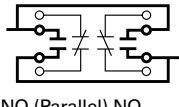
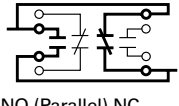
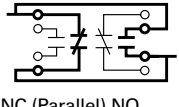


No.	Desired Circuit and Operator Position	Cam Code #2		Cam Code #3		
		Contact Blocks and Mounting Location		Contact Blocks and Mounting Location		
	  	1	2	1	2	
1	X O O	 NO (Series) NC		 NO		
2	X X O	 NC		 NC		
3	X O X	 NO	 NO (Parallel) NO			
4	O O X	 NO		 NO		
5	O X X	 NC (Parallel) NO		 NC		
6	O X O	 NC	 NC (Series) NC			

Table 2-364. 4-Position Selector Switch

Number	Desired Circuit and Operator Position	Cam Code #7	
		Contact Blocks and Mounting Location	
	   	1	2
1	X O O O	 NC	
2	O X O O	 NO	
3	O O X O	 NO	
4	O O O X	 NC	
5	X O O X	 NC (Parallel) NC	
6	O X X O	 NO (Parallel) NO	
7	O O X X	 NO (Parallel) NC	
8	X X O O	 NC (Parallel) NO	
9	O X O X	 NO/NC (Parallel)	
10	X O X O	 NO/NC (Parallel)	

2

10250T Series, Selector Switch Components

Selector Switch Operators

10250T Selector Switch Operators with Caps

Table 2-365. 10250T Selector Switch Operators with Caps — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Positions	Operator Action ①	Black Knob Selector Switch Vertical Mounting ②		Black Lever Selector Switch Vertical Mounting ②	
		Cam Code ②	Catalogue Number	Cam Code ②	Catalogue Number
2-Position 60° Throw		1	10250T1311	1	10250T3011
		1	10250T1371	1	10250T3071
3-Position 60° Throw		2	10250T1322	2	10250T3022
		3	10250T1323	3	10250T3023
		2	10250T1332	2	10250T3032
		3	10250T1333	3	10250T3033
		2	10250T1342	2	10250T3042
		3	10250T1343	3	10250T3043
4-Position 40° Throw		2	10250T1352	2	10250T3052
		3	10250T1353	3	10250T3053
4-Position 40° Throw		7	10250T1367	7	10250T3067

① M = Maintained. S = Spring return in direction of arrow (→).
 ② For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on **Pages 2-212 – 2-213**.
 ③ Field convertible to Horizontal Mounting or order operator only and separate operator cap.

Table 2-366. 10250T Key Operators with Cam — UL (NEMA) 3, 3R, 4, 4X, 12, 13

Positions	Operator Action ④	Cam Code ⑤	Optional Key Removal Positions ⑥	Vertical Mounting	Horizontal Mounting
				Catalogue Number ⑥	Catalogue Number ⑥
2-Position 60° Throw		1	1, 2, 3	10250T1511_	10250T1611_
		1	2	10250T1571_	10250T1581_
3-Position 60° Throw		2	1 – 7	10250T1522_	10250T1622_
		3		10250T1523_	10250T1623_
		2	1, 4, 5	10250T1532_	10250T1632_
		3		10250T1533_	10250T1633_
		2	4	10250T1542_	10250T1642_
		3		10250T1543_	10250T1643_
	2	2, 4, 6	10250T1652_	10250T1662_	
	3		10250T1653_	10250T1663_	
4-Position 40° Throw		7	7	10250T1677_	10250T1687_

④ M = Maintained. S = Spring return in direction of arrow (→).
 ⑤ For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on **Pages 2-212 – 2-213**.
 ⑥ Choose key removal position required for application from **Table 2-367**. Add key removal Code No. to listed Catalogue Number. Example: 10250T15112.

Table 2-367. Key Removal Positions

Code Suffix	Key Removal Positions	Code Suffix	Key Removal Positions
1	Right Only	5	Right & Centre
2	Left Only	6	Left & Centre
3	Right & Left	7	All Positions
4	Centre Only		

Note: Key removal in “spring return from” positions not recommended.

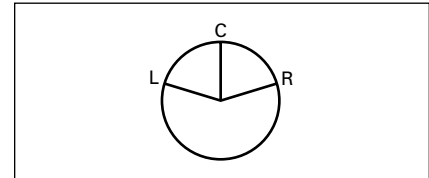


Figure 2-137. Key Removal Positions

Replacement Keys or Dissimilar Locks for Above Key Operators

Listed operators have identical locks and keys (Key Code H661) Catalogue Number 10250ED824.









Table 2-368. Replacement Keys

Description	Catalogue Number
Replacement Keys (Code H661)	10250ED824

Contact Blocks **Page 2-218**
 Dimensions **Pages 2-159 – 2-161**
 Enclosures **Page 2-219**
 Legend Plates **Pages 2-150 – 2-151**









Selector Switch Operators (Continued)

Table 2-369. E34 Selector Switch Operators with Knob Assembled UL (NEMA) 3, 3R, 4, 4X, 12, 13

Positions	Operator Action ①	Black Knob Selector Switch Vertical Mounting ③		
		Cam Code ②	Catalogue Number ④	
				
2-Position 60° Throw		1	<u>E34VFBK1</u>	
		1	<u>E34VEBK1</u>	
3-Position 60° Throw		2 3	<u>E34VGBK1</u> <u>E34VHBK1</u>	
		2 3	<u>E34VJBK1</u> <u>E34VKBK1</u>	
		2 3	<u>E34VLBK1</u> <u>E34VMBK1</u>	
		2 3	<u>E34VNBK1</u> <u>E34VPBK1</u>	
	4-Position 40° Throw		7	<u>E34VTBK1</u>

- ① M = Maintained. S = Spring return in direction of arrow (→).
- ② For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on Pages 2-212 – 2-213.
- ③ Field convertible to Horizontal Mounting.
- ④ For other colours of either knob or lever, replace the underlined characters of the Catalogue Number with the appropriate Suffix Code from Alternate Knob and Lever Table below. Example: E34VFBL2

Table 2-370. E34 Key Operators with Cam and Cap UL (NEMA) 3, 3R, 4, 4X, 12, 13

Positions	Operator Action ⑤	Cam Code ⑥	Key Removal Positions ⑦	Vertical Mounting	Horizontal Mounting	
				Catalogue Number	Catalogue Number	
						
2-Position 60° Throw		1	1, 2, 3	E34KFB_	E34KFHB_	
		1	2	E34KEB_	E34KEHB_	
3-Position 60° Throw		2 3	1 – 7	E34KGB_ E34KHB_	E34KGHB_ E34KHHB_	
		2 3	1, 4, 5	E34KJB_ E34KKB_	E34KJHB_ E34KKHB_	
		2 3	4	E34KLB_ E34KMB_	E34KLHB_ E34KMHB_	
		2 3	2, 4, 6	E34KNB_ E34KPB_	E34KNHB_ E34KPHB_	
	4-Position 40° Throw		7	7	E34KTB_	E34KTHB_

- ⑤ M = Maintained. S = Spring return in direction of arrow (→).
- ⑥ For selection of the proper cam and contact block to obtain the proper circuit sequence, see selection instructions and table on Pages 2-212 – 2-213.
- ⑦ Choose key removal position required for application from Table 2-371. Add key removal Code No. to listed Catalogue Number. Example: E34KFB2

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Page 2-214.

Table 2-371. Key Removal Positions

Code Suffix	Key Removal Positions	Code Suffix	Key Removal Positions
1	Right Only	5	Right & Centre
2	Left Only	6	Left & Centre
3	Right & Left	7	All Positions
4	Centre Only		

Note: Key removal in “spring return from” positions not recommended.

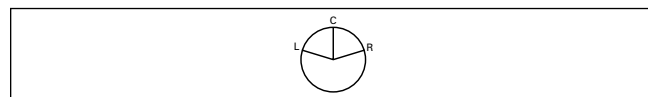





Figure 2-138. Key Removal Positions

Table 2-372. Alternate Knobs and Levers for Operators Above

Colour	Knob 		Lever 		Lever Designed for Added Ingress Protection ⑧ 	
	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number	Suffix Code	Catalogue Number
Black	K1	E34K1	L1	E34L1	A1	E34A1
Red	K2	E34K2	L2	E34L2	A2	E34A2
Green	K3	E34K3	L3	E34L3	A3	E34A3
Yellow	K4	E34K4	L4	E34L4	A4	E34A4
White	K5	E34K5	L5	E34L5	A5	E34A5
Blue	K6	E34K6	L6	E34L6	A6	E34A6
Grey	K7	E34K7	L7	E34L7	A7	E34A7
Orange	K8	E34K8	L8	E34L8	A8	E34A8

⑧ For use on maintained operators only.

Contact Blocks..... Page 2-218
 Dimensions..... Page 2-190
 Enclosures..... Page 2-219
 Legend Plates..... Page 2-183

10250T Series, Selector Switch Components

Illuminated Selector Switch Operators



*2-Position Maintained
 120V AC Transformer
 Selector Switch,
 Cam Code 1
 Catalogue Number
 10250T5971*

Table 2-373. 10250T Illuminated Selector Switch Operator Only without Knob or Lever

Positions	Operator Action ①	Transformer Type — 50/60 Hz			Full Voltage Type — AC or DC ④		
		6 Volt #755 Lamp			Lamps: 6V — #755, 12V — #756, 24V — #757, 48V — #1835, 120/240V — 120MB		
		Voltage	Cam Code ③	Catalogue and Code Number ②	Voltage	Cam Code ③	Catalogue and Code Number ②
2-Position – 60° Throw		24 120 208 240 380 480 600	1	10250T5961H 10250T5971H 10250T6511H 10250T5981H 10250T5991H 10250T6001H 10250T6011H	6 12 24 48 120 240 ⑤	1	10250T6201H 10250T6211H 10250T6221H 10250T6231H 10250T6361H 10250T6371H
3-Position – 60° Throw		24 120 208 240 380 480 600	+ 2 or 3	10250T602_H 10250T603_H 10250T652_H 10250T604_H 10250T605_H 10250T606_H 10250T607_H	6 12 24 48 120 240 ⑤	+ 2 or 3	10250T624_H 10250T625_H 10250T626_H 10250T627_H 10250T638_H 10250T639_H
		120 240	+ 2 or 3	10250T620_H 10250T656_H	120	+ 2 or 3	10250T622_H
		120 240	+ 2 or 3	10250T621_H 10250T662_H	120	+ 2 or 3	10250T623_H
		24 120 208 240 380 480 600	+ 2 or 3	10250T614_H 10250T615_H 10250T653_H 10250T616_H 10250T617_H 10250T618_H 10250T619_H	6 12 24 48 120 240 ⑤	+ 2 or 3	10250T628_H 10250T629_H 10250T630_H 10250T631_H 10250T640_H 10250T641_H
4-Position – 40° Throw		24 120 208 240 380 480 600	7	10250T6087H 10250T6097H 10250T6547H 10250T6107H 10250T6117H 10250T6127H 10250T6137H	6 12 24 48 120 240 ⑤	7	10250T6327H 10250T6337H 10250T6347H 10250T6357H 10250T6427H 10250T6437H

① M = Maintained. S = Spring return in direction of arrow (→).

② Operator includes lens gasket and lens attachment screws.

③ For selection of the proper cam and contact block, to obtain the proper circuit sequence, see selection table on **Page 2-213**.

④ Full voltage light units can be used at other than listed voltages by changing lamp. Replacement lamps are listed on **Page 2-156**.

⑤ Resistor type. May generate excess heat if used in high density.

Table 2-374. Knobs, Levers

Colour ⑥	Catalogue and Code Number	
	Knob	Lever
Red	10250TER	10250TFR
Green	10250TEG	10250TFG
Yellow	10250TEA	10250TFA
Blue	10250TEL	10250TFL
Clear	10250TEC	10250TFC
White	10250TEW	10250TFW
Amber	10250TEM	10250TFM

⑥ Amber, Clear and White lenses have a black arrow (pointer), Red, Green and Blue lenses have a white arrow (pointer).

Contact Blocks **Page 2-218**
 Dimensions **Pages 2-159 – 2-161**
 Enclosures **Page 2-219**
 Legend Plates **Pages 2-150 – 2-151**

April 2009

E34 Series, Selector Switch Components



**2-Position Maintained 120V AC
 Transformer Selector Switch, Cam 1
 Catalogue Number E34VFB120**

Table 2-375. E34 Illuminated Selector Switch Operator Only without Knob or Lever

Positions	Operator Action	Transformer Type — 50/60 Hz		Full Voltage Type — AC or DC ③	
		6 Volt #755 Lamp		Lamps — #755, #757, #1835, 120MB ④	
		Catalogue Number ① ⑤		Catalogue Number ⑤	
2-Position — 60° Throw 3-Position — 60° Throw		Cam Code 1 ② E34VFB_H		Cam Code 1 ② E34SFB_H	
		Cam Code 2 ② E34VGB_H	Cam Code 3 ② E34VHB_H	Cam Code 2 ② E34SGB_H	Cam Code 3 ② E34SHB_H
		E34VNB_H ⑥	E34VPB_H ⑥	E34SNB_H ⑦	E34SPB_H ⑦
		E34VJB_H ⑥	E34VKB_H ⑥	E34SJB_H ⑦	E34SKB_H ⑦
		E34VLB_H	E34VMB_H	E34SLB_H	E34SMB_H
4-Position — 40° Throw		E34VRB_H	—	E34SRB_H	—

- ① Operator includes lens gasket and lens attachment screws.
- ② For selection of the proper cam and contact block required to obtain a specific circuit sequence, see selection table on **Page 2-213**.
- ③ Full voltage light units can be used at other than listed voltages by changing lamp. Replacement lamps are listed on **Page 2-156**.
- ④ 120MB lamps are used on both 120V and 240V operators.
- ⑤ Replace underscore with proper voltage Suffix Code from Light Unit Voltage Suffix Table below. Example: 3-position maintained with 120V transformer type light unit: E34VGB**120**H
- ⑥ 120 and 240V transformer only.
- ⑦ 120 full voltage only.

Table 2-376. Light Unit Voltage Suffix — Add to operator Catalogue Number listed in table above.

Type of Light Unit			
Transformer Type 50/60 Hz		Full Voltage Type AC or DC ⑧	
Voltage	Suffix Code	Voltage	Suffix Code
24	024	6	06
120	120	12	12
208	208	24	24
240	240	48	48
380	380	120	120
480	480	240 ⑨	240
600	600		

- ⑧ Full voltage light units can be used at other than listed voltages by changing lamp. Replacement lamps are listed on **Page 2-156**.
- ⑨ Resistor type. May generate excess heat if used in high density.

Table 2-377. Knobs, Levers

	Colour ⑩	Catalogue Number and Code Number	
		Knob	Lever
	Red	10250TER	10250TFR
	Green	10250TEG	10250TFG
	Yellow	10250TEA	10250TFA
	Blue	10250TEL	10250TFL
	Clear	10250TEC	10250TFC
	White	10250TEW	10250TFW
	Amber	10250TEM	10250TFM

- ⑩ Amber, clear and white lenses have a black arrow (pointer). Red, green and blue lenses have a white arrow (pointer).

Note: Use NEMA 4X 10250T operators where exposed to ultraviolet light, see **Page 2-216**.

Contact Blocks..... **Page 2-218**
 Dimensions..... **Page 2-190**
 Enclosures..... **Page 2-219**
 Legend Plates..... **Page 2-183**

10250T/E34 Series, Contact Blocks and Mounting Adapters



Contact Block
Catalogue Number
10250T1H



Mounting Adapter
Catalogue Number
10250TD2

Options

Contact Blocks and Mounting Adapters

Table 2-378. Contact Block — NEC Class I Division 2, Groups B, C and D

Units	Description	Catalogue Number
1NO-1NC	Class I Div. 2 Factory Sealed Contact Block	10250T1H

Table 2-379. Mounting Adapter

Units	Description	Catalogue Number
	Mounting Adapter for Pushbuttons	10250TD2
	Mounting Adapter for Selector Switches	10250TD3

Table 2-380. Mounting Adapters with Contact Block(s) — Overpacked — NEC Class I Division 2 Groups B, C and D

Units	Description	Catalogue Number
	Pushbutton Adapter with 1NO-1NC	10250TD21H
	Pushbutton Adapter with 2 (1NO-1NC)	10250TD21H1H
	Selector Switch Adapter with 1NO-1NC	10250TD31H
	Selector Switch Adapter with 2 (1NO-1NC)	10250TD31H1H

2

Approximate Dimensions

Dimensions in Inches (mm). Dimensions are not intended to be used for manufacturing purposes.

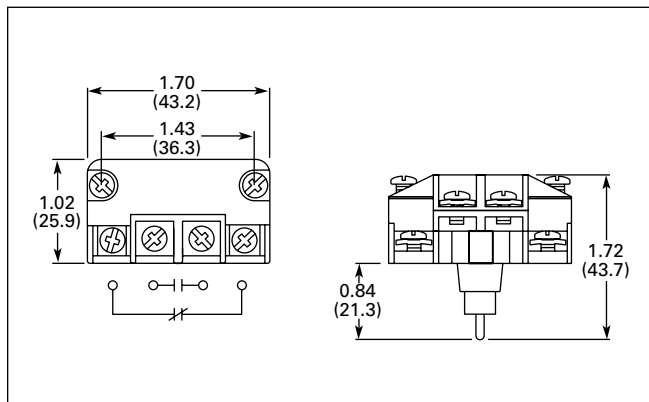


Figure 2-139. Contact Block

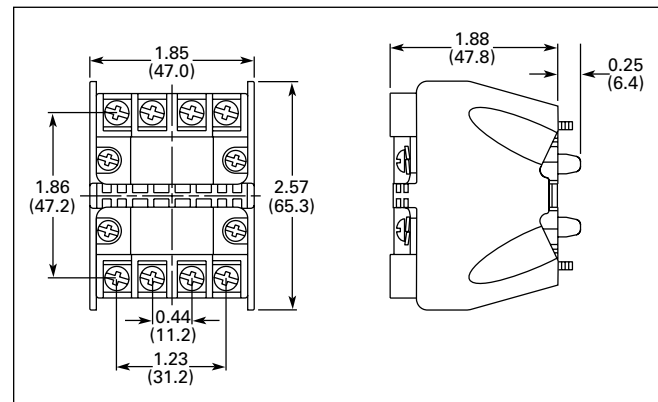





Figure 2-140. Mounting Adapter

Enclosures

Die Cast, Polyester and Stainless Steel Enclosures

Table 2-381. Enclosures (Case and Cover) — Surface Mounting ①

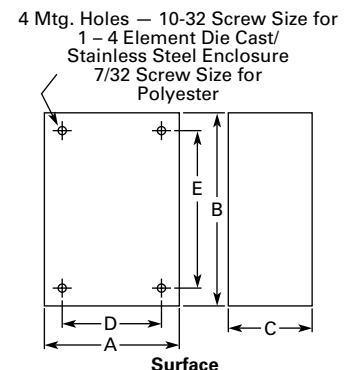
	Number of Elements	10250T	E34
		Catalogue Number	Catalogue Number
 Die Cast Enclosure Catalogue Number 10250TN11	Cast Enclosure — Deep Cover — In-Line NEMA 4, 4X, 12, 13		
	1	10250TN11	E34N11
	2	10250TN12	E34N12
	3	10250TN13	E34N13
	4	10250TN14	E34N14
 Polyester Enclosure Catalogue Number E34N52	Polyester — In-Line NEMA 3, 4X, 12		
	1	—	E34N51
	2	—	E34N52
	3	—	E34N53
	4	—	E34N54
 Stainless Steel Enclosure Catalogue Number 10250TN35	Stainless Steel ② — In-Line NEMA 4, 4X, 12		
	1	—	10250TN33
	2	—	10250TN34
	3	—	10250TN35
	4	—	10250TN36

① For spacing increments, see Page 2-153.

② 14 gauge, type 304.

Table 2-382. Approximate Dimensions

Number of Elements	Element Arrangement	Surface Mounting					Conduit Entrance	Approximate Dimensions
		Dimensions in Inches (mm)						
		Wide A	High B	Deep C	Mounting			
					D	E		
Cast								
1	In-Line	3.88 (98.6)	4.0 (101.6)	3.0 (76.3)	2.69 (68.3)	3.25 (82.6)	3/4	
2	In-Line	3.88 (98.6)	5.88 (149.4)	3.0 (76.3)	2.69 (68.3)	5.13 (130.3)	3/4	
3	In-Line	3.88 (98.6)	7.75 (196.9)	3.0 (76.3)	2.69 (68.3)	7.0 (177.8)	1	
4	In-Line	3.88 (98.6)	9.63 (244.6)	3.0 (76.3)	2.69 (68.3)	8.88 (225.6)	1	
Polyester								
1	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)	③	
2	In-Line	3.81 (96.8)	6.63 (168.4)	3.38 (85.9)	2.94 (74.7)	4.88 (124.0)		
3	In-Line	3.81 (96.8)	8.88 (225.6)	3.38 (85.9)	2.94 (74.7)	7.13 (181.1)		
4	In-Line	3.81 (96.8)	11.13 (282.7)	3.38 (85.9)	2.94 (74.7)	9.38 (238.3)		
Stainless Steel								
1	In-Line	3.00 (76.2)	3.50 (88.9)	3.00 (76.2)	1.50 (38.1)	4.25 (108.0)	③	
2	In-Line	3.50 (88.9)	6.75 (171.5)	3.00 (76.2)	1.50 (38.1)	7.50 (190.5)		
3	In-Line	3.50 (88.9)	9.00 (228.6)	3.00 (76.2)	1.50 (38.1)	9.00 (228.6)		
4	In-Line	3.50 (88.9)	11.25 (285.8)	3.00 (76.2)	1.50 (38.1)	12.00 (304.8)		



③ No conduit entrance holes provided. Drill as required.

Application Notes:

- Operators need to be mounted in their horizontal orientation for all enclosures. For die cast enclosures remove locating nib on operators and use thrust washer (Catalogue Number 10250TK3).
- Polyester enclosures must be used when mounting illuminated operators.

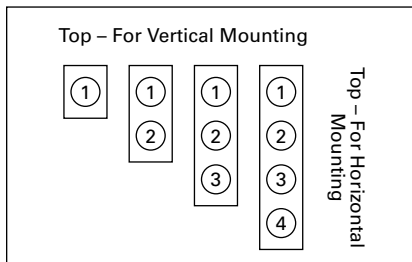


Figure 2-141. Enclosure Layouts

Mounting and Assembly

Panel Thickness

- Minimum: 0.06 inch (1.6 mm)
- Maximum: 0.25 inch (8 mm) including legend plate
- Maximum can be increased to 0.375" (15.9 mm) using optional retaining nut
 - Indicating Light: 10250TA30/E34TA30
 - Pushbutton/Selector Switch: 10250TA31/E34TA31

Table 2-383. Mounting Matrix

Legend Plate	Dimensions in Inches (mm)			
	A	B	C	D
Small	2.87 (72.6)	2.25 (57.2)	2.25 (57.2)	2.87 (72.6)
Jumbo	2.87 (72.6)	2.32 (58.6)	2.32 (58.6)	2.87 (72.6)
Extra Large	2.87 (72.6)	2.56 (65.2)	2.52 (64.1)	2.87 (72.6)

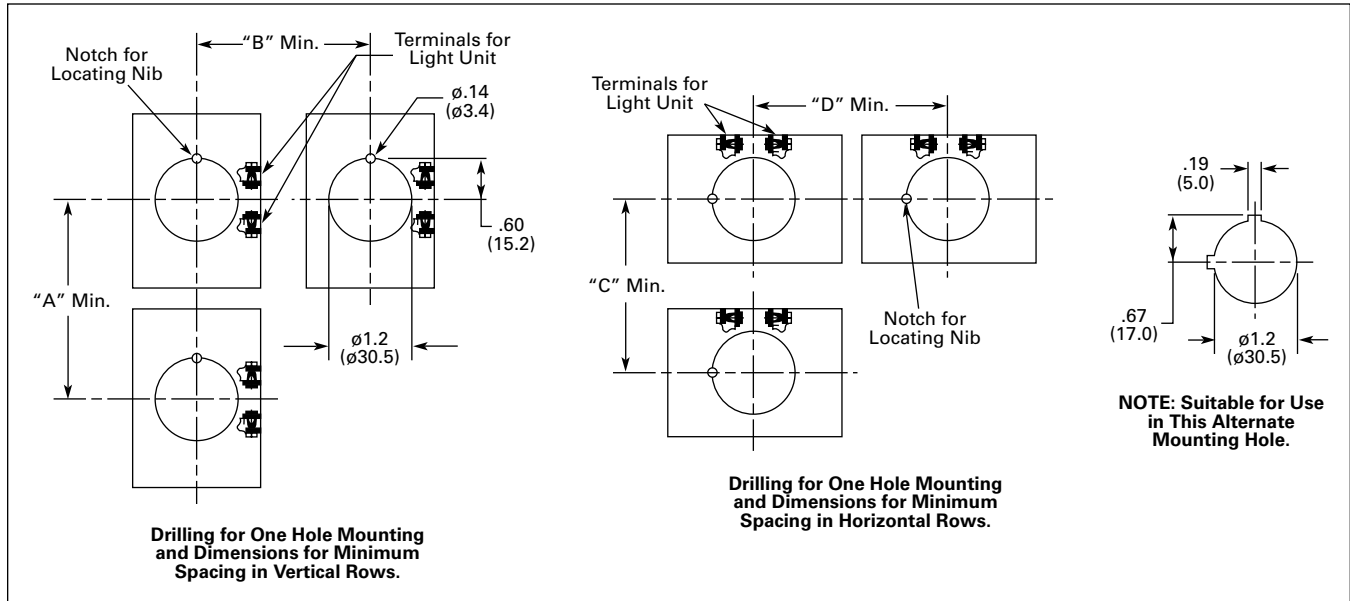


Figure 2-142. Panel Spacing and Drilling Drawings

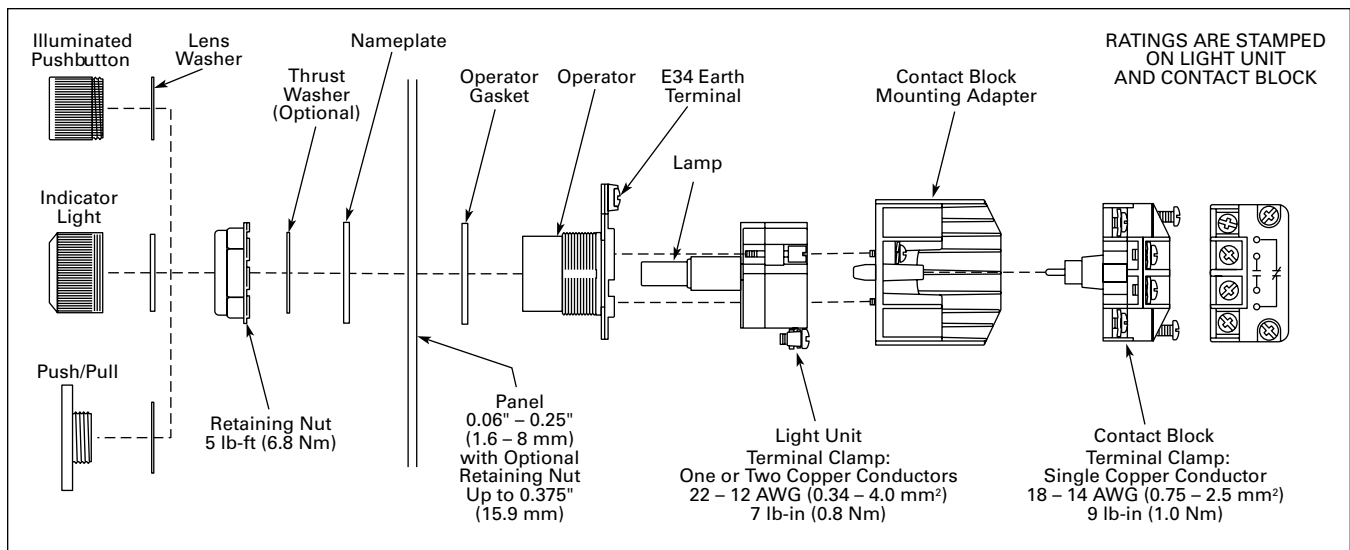
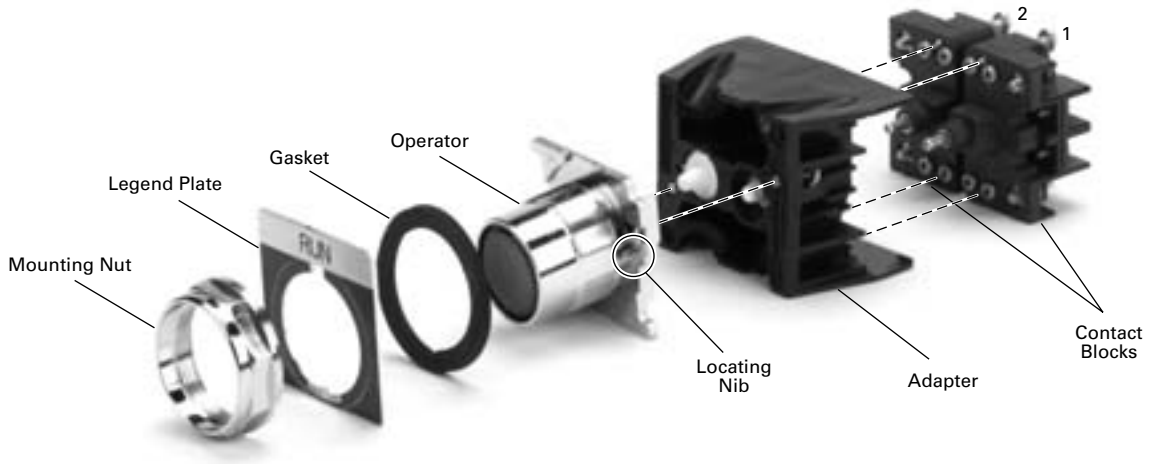


Figure 2-143. Operator Assembly

Catalogue Number Structure



10250T/E34 Series

Table 2-384. Non-illuminated Assembled Operators — Class I Division 2 Catalogue Numbering System

10250T	718	E	J								
<table border="1"> <tr><th>Operator Type</th></tr> <tr><td>10250T = Heavy-Duty Oiltight E34EX = Corrosion Resistant Oiltight</td></tr> </table>	Operator Type	10250T = Heavy-Duty Oiltight E34EX = Corrosion Resistant Oiltight	<table border="1"> <tr><th>Operator and Contact Block</th></tr> <tr><td>706 = Flush 1NO-1NC 707 = Flush 2NO-2NC 708 = Extended 1NO-1NC 709 = Extended 2NO-2NC 710 = Mushroom 1NO-1NC 711 = Mushroom 2NO-2NC 712 = JMB Mushroom 1NO-1NC 713 = JMB Mushroom 2NO-2NC 714 = 2P MT Push-Pull 1NO-1NC 715 = 2P MT Push-Pull 2NO-2NC 716 = 3P MT Push-Mom Pull 1NO-1NC 717 = 3P MT Push-Mom Pull 2NO-2NC 718 = 3P Mom Push-Pull 1NO-1NC 721 = 3P Mom Push-Pull 2NO-2NC 722 = 2P SS MT XO,OX-CAM1 723 = 2P SS MT XO,OX,XO,OX-CAM1 724 = 2P SS SPR-R XO,OX-CAM1 725 = 2P SS SPR-R XO,OX,XO,OX-CAM1 726 = 3P SS MT XO,OX,OX-CAM3 727 = 3P SS MT XO,OX,OX-CAM3 728 = 3P SS SPR-L XO,OX,OX-CAM3 729 = 3P SS SPR-L XO,OX,OX-CAM3 730 = 3P SS SPR-L&R XO,OX,OX-CAM3 731 = 3P SS SPR-L&R XO,OX,OX-CAM3 732 = 3P SS SPR-R XO,OX,OX-CAM3 733 = 3P SS SPR-R XO,OX,OX-CAM3 743 = 4P SS MT XOO,OXO,OOX,OOX-CAM7</td></tr> </table>	Operator and Contact Block	706 = Flush 1NO-1NC 707 = Flush 2NO-2NC 708 = Extended 1NO-1NC 709 = Extended 2NO-2NC 710 = Mushroom 1NO-1NC 711 = Mushroom 2NO-2NC 712 = JMB Mushroom 1NO-1NC 713 = JMB Mushroom 2NO-2NC 714 = 2P MT Push-Pull 1NO-1NC 715 = 2P MT Push-Pull 2NO-2NC 716 = 3P MT Push-Mom Pull 1NO-1NC 717 = 3P MT Push-Mom Pull 2NO-2NC 718 = 3P Mom Push-Pull 1NO-1NC 721 = 3P Mom Push-Pull 2NO-2NC 722 = 2P SS MT XO,OX-CAM1 723 = 2P SS MT XO,OX,XO,OX-CAM1 724 = 2P SS SPR-R XO,OX-CAM1 725 = 2P SS SPR-R XO,OX,XO,OX-CAM1 726 = 3P SS MT XO,OX,OX-CAM3 727 = 3P SS MT XO,OX,OX-CAM3 728 = 3P SS SPR-L XO,OX,OX-CAM3 729 = 3P SS SPR-L XO,OX,OX-CAM3 730 = 3P SS SPR-L&R XO,OX,OX-CAM3 731 = 3P SS SPR-L&R XO,OX,OX-CAM3 732 = 3P SS SPR-R XO,OX,OX-CAM3 733 = 3P SS SPR-R XO,OX,OX-CAM3 743 = 4P SS MT XOO,OXO,OOX,OOX-CAM7	<table border="1"> <tr><th>ACC/SS Type</th></tr> <tr><td>Blank = None J = JMB Push-Pull B = Booted-FL/EXT G = Guarded-FL K = Knob-SS L = Lever-SS A = Lever W/IP-SS C = Coin-SS Keyed-SS</td></tr> </table>	ACC/SS Type	Blank = None J = JMB Push-Pull B = Booted-FL/EXT G = Guarded-FL K = Knob-SS L = Lever-SS A = Lever W/IP-SS C = Coin-SS Keyed-SS	<table border="1"> <tr><th>Cam</th></tr> <tr><td>1 2 3 7</td></tr> </table>	Cam	1 2 3 7
Operator Type											
10250T = Heavy-Duty Oiltight E34EX = Corrosion Resistant Oiltight											
Operator and Contact Block											
706 = Flush 1NO-1NC 707 = Flush 2NO-2NC 708 = Extended 1NO-1NC 709 = Extended 2NO-2NC 710 = Mushroom 1NO-1NC 711 = Mushroom 2NO-2NC 712 = JMB Mushroom 1NO-1NC 713 = JMB Mushroom 2NO-2NC 714 = 2P MT Push-Pull 1NO-1NC 715 = 2P MT Push-Pull 2NO-2NC 716 = 3P MT Push-Mom Pull 1NO-1NC 717 = 3P MT Push-Mom Pull 2NO-2NC 718 = 3P Mom Push-Pull 1NO-1NC 721 = 3P Mom Push-Pull 2NO-2NC 722 = 2P SS MT XO,OX-CAM1 723 = 2P SS MT XO,OX,XO,OX-CAM1 724 = 2P SS SPR-R XO,OX-CAM1 725 = 2P SS SPR-R XO,OX,XO,OX-CAM1 726 = 3P SS MT XO,OX,OX-CAM3 727 = 3P SS MT XO,OX,OX-CAM3 728 = 3P SS SPR-L XO,OX,OX-CAM3 729 = 3P SS SPR-L XO,OX,OX-CAM3 730 = 3P SS SPR-L&R XO,OX,OX-CAM3 731 = 3P SS SPR-L&R XO,OX,OX-CAM3 732 = 3P SS SPR-R XO,OX,OX-CAM3 733 = 3P SS SPR-R XO,OX,OX-CAM3 743 = 4P SS MT XOO,OXO,OOX,OOX-CAM7											
ACC/SS Type											
Blank = None J = JMB Push-Pull B = Booted-FL/EXT G = Guarded-FL K = Knob-SS L = Lever-SS A = Lever W/IP-SS C = Coin-SS Keyed-SS											
Cam											
1 2 3 7											
			<table border="1"> <tr><th>Key Removal</th></tr> <tr><td>1 = RT Only 2 = LT Only 3 = RT & LT 4 = CT Only 5 = RT & CT 6 = LT & CT 7 = All</td></tr> </table>	Key Removal	1 = RT Only 2 = LT Only 3 = RT & LT 4 = CT Only 5 = RT & CT 6 = LT & CT 7 = All						
Key Removal											
1 = RT Only 2 = LT Only 3 = RT & LT 4 = CT Only 5 = RT & CT 6 = LT & CT 7 = All											
		<table border="1"> <tr><th>Button Colour</th></tr> <tr><td>B = Black R = Red G = Green Y = Yellow W = White L = Blue N = Orange E = Red EMERG STOP T = Keyed-SS</td></tr> </table>	Button Colour	B = Black R = Red G = Green Y = Yellow W = White L = Blue N = Orange E = Red EMERG STOP T = Keyed-SS							
Button Colour											
B = Black R = Red G = Green Y = Yellow W = White L = Blue N = Orange E = Red EMERG STOP T = Keyed-SS											

Summary of NEC Article 500

The NEC Article 500 explains in great detail the requirements for the installation of wiring and electrical equipment in hazardous locations. The purpose of this summary is for general reference only, the National Electric Code along with other applicable authorities having jurisdiction over the site should be the installer's guidelines when wiring or installing electrical equipment in any hazardous or potentially hazardous location.

Class I, Division 2 Definition

Class I, Division 2 covers hazardous locations where flammable gases, vapors or volatile liquids are handled either in a closed system, or confined within suitable enclosures, or where hazardous concentrations are normally prevented by positive mechanical ventilation. Areas adjacent to Division 1 locations, into which gases might occasionally flow, would also belong to Division 2 (NEC (500-5[b])).

2

Hazardous Location

Any area where there is the possibility of explosion and fire resulting from the presence of flammable vapors, liquids or gas, or combustible dust or fibers.

Summary of NEC Article 505

The NEC also classifies hazardous locations for flammable gases and vapors into zones under NEC 505. This system is more in line with the European Standards, CENELEC and IEC, with the major difference being that NEC 505 only classifies gases and vapors while CENELEC and IEC also include dusts.

Summary of Classifications — NEC 500 – 503

Class	Division	Group
I. Gas	1. Hazard may exist — May exist in atmosphere under normal operating conditions	A. Acetylene
		B. Hydrogen and manufactured gases containing 30% hydrogen by volume (e.g. butadiene, ethylene oxide, propylene oxide)
	2. Potential hazard — May be present in atmosphere only under abnormal circumstances OR location adjacent to Class I, Division 1 location	C. Petrochemicals (e.g. carbon monoxide, ether, ethylene, hydrogen sulfide, morpholine, cyclopropane)
		D. Petrochemicals (e.g. gasoline, benzene, butane, propane, acetone, ammonia, vinyl chloride)
II. Dust	1. Hazard may exist — May exist in atmosphere under normal operating conditions	A. Acetylene
		B. Hydrogen and manufactured gases containing 30% hydrogen by volume (e.g. butadiene, ethylene oxide, propylene oxide)
		C. Petrochemicals (e.g. carbon monoxide, ether, ethylene, hydrogen sulfide, morpholine, cyclopropane)
	2. Potential hazard — May be present in atmosphere only under abnormal circumstances	D. Petrochemicals (e.g. gasoline, benzene, butane, propane, acetone, ammonia, vinyl chloride)
		E. Conductive and combustible dust (resistivity <10 ⁵ ohm/cm) (metal dusts)
		F. Carbonaceous dusts (resistivity >10 ² ohms/cm but ≤10 ⁸ ohms/cm) (e.g. carbon black, coke dust, coal)
		G. Non-conductive combustible dust (resistivity ≥10 ⁵ ohms/cm) (e.g. grain dust, flour, starch, sugar, plastics)
III. Fibers	1. Production areas	Easily ignitable fibers or flyings
	2. Handling and storage areas	Easily ignitable fibers or flyings

Note: For additional information on grouping of compounds, see NFPA 497M-1991 and NFPA 325-1994.

Summary of Classifications — NEC 505

Class	Zone	Group
I. Gas	0. Continuously present or present for long periods of time	IIC. Acetylene, hydrogen or equivalent hazard
		IIB. Acetaldehyde, ethylene or equivalent hazard
	1. Likely to exist under normal operating or maintenance conditions or adjacent to Zone 0	IIA. Acetone, ammonia, ethyl alcohol, gasoline, methane, propane or equivalent hazard
		IIC. Acetylene, hydrogen or equivalent hazard
	2. Not likely to occur in normal operation and if they do occur will only exist for short period or adjacent to Zone 1	IIB. Acetaldehyde, ethylene or equivalent hazard
		IIA. Acetone, ammonia, ethyl alcohol, gasoline, methane, propane or equivalent hazard
		IIC. Acetylene, hydrogen or equivalent hazard
		IIB. Acetaldehyde, ethylene or equivalent hazard

Summary of Basic Methods Available for Class I, Division 2 Locations

Method	Features		
	Configuration	Advantages	Disadvantages
Factory Sealed Contact Block	Closed-ended labyrinth contact block with an incendive circuit incapable of external ignition	<ul style="list-style-type: none"> Higher continuous carrying amperages — up to 10A Direct drive contacts — contacts can be forced open Suitable for use in all enclosures Best suited for motor control applications 	<ul style="list-style-type: none"> May not be suitable for logic level circuits
Hermetically Sealed Block	Reed switch sealed against an external atmosphere	<ul style="list-style-type: none"> Suitable for low energy level circuits Suitable for use in all enclosures 	<ul style="list-style-type: none"> Lower continuous carrying amperages are not suitable for motor control applications (typically 3A to 5A rated) Contacts cannot be forced open Permanent magnet attracts metallic dust and filings that can reduce the electrical creepage distance between live terminals
Explosion Proof Enclosures (Class I, Division 1 and 2)	Enclosures capable of withstanding an internal explosion while preventing external ignition. Enclosures designed for Class I, Div. 1 can safely be used in Class I, Div. 2	<ul style="list-style-type: none"> Higher level of protection than required for Class I Division 2 	<ul style="list-style-type: none"> Higher material and installation costs Conduit sealing is still required Time consuming maintenance

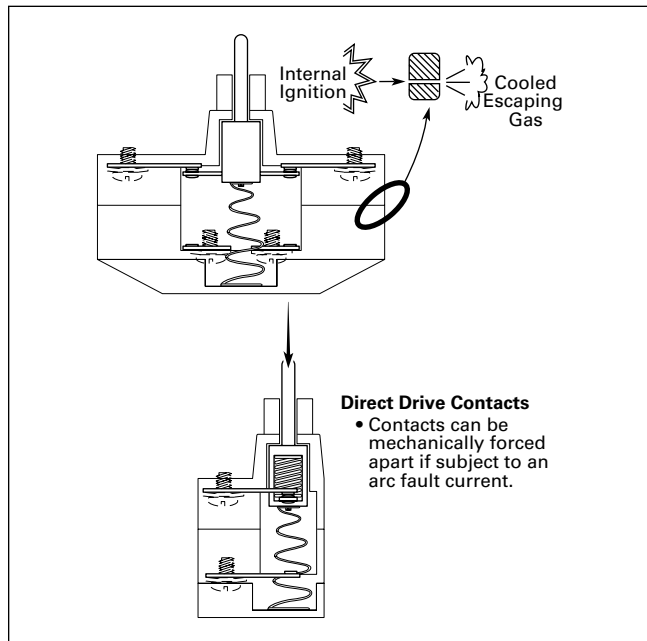


Figure 2-144. Factory Sealed Contact Blocks

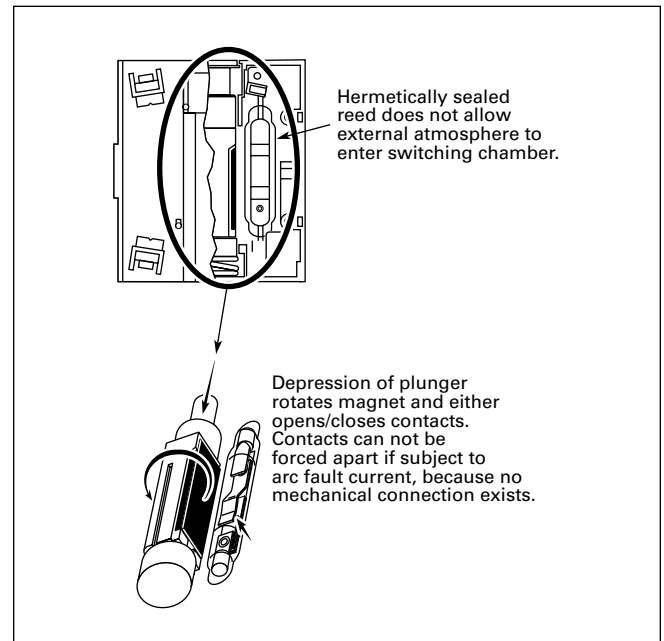


Figure 2-145. Hermetically Sealed Reed Contact Block

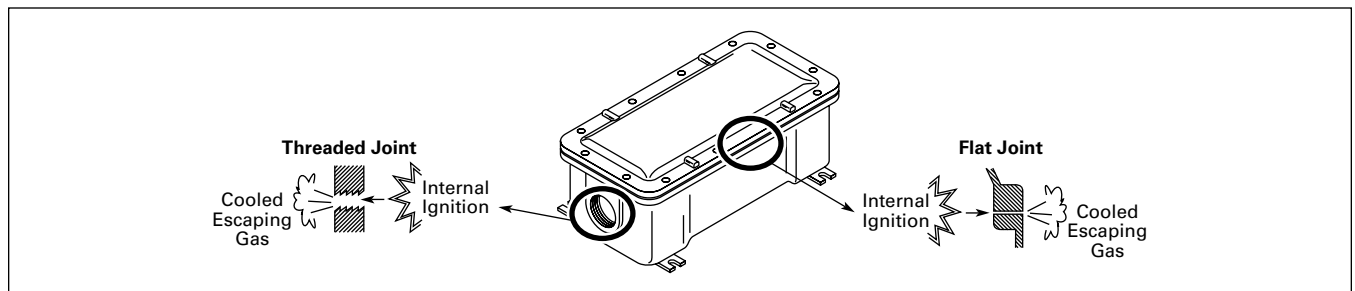


Figure 2-146. Explosion Proof Enclosure

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