

E50 Heavy-Duty Factory Sealed 6P+ Switches

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E50 Heavy-Duty Factory Sealed 6P+ Switches

Product Description

E50 6P+ Limit Switches by Eaton's electrical sector were specifically designed to withstand the penetrating properties of cutting fluids and coolants, such as those used in the automotive industry, as well as extreme shock, vibration and temperature fluctuations. The one-piece, epoxy filled switch body is prewired at the factory to ensure leak-proof, submersible performance. This unique construction positively stops fluid from finding its way to any and all critical connections.

Our 6P+ switches can be ordered in separate components or as complete assembled devices. They are available with prewired 16 AWG cables or mini-connectors. Standard and custom cable lengths are available. As part of the E50 line, the 6P+ switches use the same operating heads as the standard E50 plug-in models to reduce the components you need to inventory.

Features

- Manufactured to take the physical and environmental abuse (including cutting fluids and chemicals) of harsh industrial environments
- Modular, plug-in components (head and switch body) provide application flexibility, reduced inventory and less downtime
- Chemical resistant Viton gaskets, seals and boots are standard, and so are captive, posi-drive screws
- A special tertiary seal on the switch body prevents fluid from entering even when the operating head is not attached
- 600V rating, ridge-topped contacts and wiping action assure continuity even to logic level circuits
- Factory wired cable features a 350 pound pullout capacity
- Keyed, four direction head positioning. Standard 5° pre-travel and 90° total travel
- 24–120 Vac/dc LED and 120 Vac neon indicating lights available
- Rotary heads are field convertible CW, CCW, or both, without special tools

Standards and Certifications

- UL Listed
- CSA Certified
- IEC.9475.1
- TUV—E9271605E02
- CE (where shown)



⚠ DANGER

THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE. This sensor is designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safety-related use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.

For the most current information on this product, visit our Web site: www.eaton.com

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578.
For Application Assistance in the U.S. and Canada call 1-800-426-9184.

Product Selection

Assembled Switches—Standard

Connection is by 8 ft cable ①.

Assembled Switch E50 Heavy-Duty Factory Sealed 6P+ Switches, Assembled—Standard



Lever sold separately



Single-Pole



Two-Pole

Indicating Light:	None	LED (24–120 Vac/dc)	Neon (120 Vac)	None	LED (24–120 Vac/dc)	Neon (120 Vac)
Switch Body:	E50SA6P 1NO-1NC	E50SAL6P 1NO-1NC	E50SAN6P 1NO-1NC	E50SB6P 2NO-2NC	E50SBL6P 2NO-2NC	E50SBN6P 2NO-2NC

Operating Head Type ②

Side Rotary



Description	Assembled Switch Catalog Number			Assembled Switch Catalog Number		
Side Rotary (requires an operating lever, see Page V8-T2-80)						
Standard spring return—E50DR1 ③	E50AR16P C C	E50ALR16P	E50ANR16P	E50BR16P	E50BLR16P	E50BNR16P
Low force spring return—E50DL1 ③	E50AL16P C C	E50ALL16P	E50ANL16P	E50BL16P	E50BLL16P	E50BNL16P
Maintained two-position—E50DM1	E50AM16P C C	E50ALM16P	E50ANM16P	E50BM16P	E50BLM16P	E50BNM16P

Spring Return



Spring return—E50DS1	E50AS16P C C	E50ALS16P	E50ANS16P	E50BS16P	E50BLS16P	E50BNS16P
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Adjustable Spring Return



Adjustable spring return—E50DS2	E50AS26P C C	E50ALS26P	E50ANS26P	E50BS26P	E50BLS26P	E50BNS26P
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Circuit Diagrams, see Page V8-T2-77.

Notes

① Connection options (add the code suffix from the table below to the end of the catalog number):

Option		Catalog Number	Code Suffix
Mini-connector ④	Single-pole (5-pin mini-connector)	CSMS5D5CY1602	C
	Two-pole (9-pin mini-connector)	CSMS9D9CY1602	C
Cable connection	12 ft cable length (standard)	—	12
	20 ft cable length (standard)	—	20
	Other lengths (special order)	—	Length in ft

② For operating head specifications, see Page V8-T2-72.

③ CW (clockwise) and CCW (counterclockwise) operation, easily convertible to CW only or CCW only operation.

④ For a full selection of connector cables, see Tab 10, section 10.1.

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Limit Switches

E50 Heavy-Duty Factory Sealed 6P+ Switches

Connection is by 8 ft cable ①.

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Assembled Switch

E50 Heavy-Duty Factory Sealed 6P+ Switches, Assembled—Standard, continued



Lever sold separately



Single-Pole



Two-Pole

Indicating Light:	Single-Pole			Two-Pole		
	None	LED (24–120 Vac/dc)	Neon (120 Vac)	None	LED (24–120 Vac/dc)	Neon (120 Vac)
Switch Body:	E50SA6P 1N0-1NC	E50SAL6P 1N0-1NC	E50SAN6P 1N0-1NC	E50SB6P 2N0-2NC	E50SBL6P 2N0-2NC	E50SBN6P 2N0-2NC
Operating Head Type ②	Description			Description		
	Assembled Switch Catalog Number			Assembled Switch Catalog Number		

Operating Head Type ②

Side Push Roller



Description	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number
Side Push Roller						
Spring return—E50DS3 ③	E50AS36P CE	E50ALS36P	E50ANS36P	E50BS36P	E50BLS36P	E50BNS36P

Side Pushbutton



Description	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number
Side Pushbutton						
Maintained—E50DH1	E50AH16P CE	E50ALH16P	E50ANH16P	E50BH16P	E50BLH16P	E50BNH16P

Top Pushbutton

Spring Return



Description	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number
Spring return—E50DT1	E50AT16P CE	E50ALT16P	E50ANT16P	E50BT16P	E50BLT16P	E50BNT16P

Adjustable Spring Return



Description	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number	Assembled Switch Catalog Number
Adjustable spring return—E50DT2	E50AT26P CE	E50ALT26P	E50ANT26P	E50BT26P	E50BLT26P	E50BNT26P

Circuit Diagrams, see [Page V8-T2-77](#).

Notes

① Connection options (add the code suffix from the table below to the end of the catalog number):

Option		Catalog Number	Code Suffix
Mini-connector ④	Single-pole (5-pin mini-connector)	CSMS5D5CY1602	C
	Two-pole (9-pin mini-connector)	CSMS9D9CY1602	C
Cable connection	12 ft cable length (standard)	—	12
	20 ft cable length (standard)	—	20
	Other lengths (special order)	—	Length in ft

② For operating head specifications, see [Page V8-T2-72](#).

③ Roller can be converted in the field between horizontal and vertical.

④ For a full selection of connector cables, see [Tab 10, section 10.1](#).

Connection is by 8 ft cable ①.

Assembled Switch E50 Heavy-Duty Factory Sealed 6P+ Switches, Assembled—Standard, continued



Lever sold separately



Single-Pole



Two-Pole

Indicating Light:	None	LED (24–120 Vac/dc)	Neon (120 Vac)	None	LED (24–120 Vac/dc)	Neon (120 Vac)
Switch Body:	E50SA6P 1NO-1NC	E50SAL6P 1NO-1NC	E50SAN6P 1NO-1NC	E50SB6P 2NO-2NC	E50SBL6P 2NO-2NC	E50SBN6P 2NO-2NC

Operating Head Type ②

Top Push Roller



Description	Assembled Switch Catalog Number			Assembled Switch Catalog Number		
Top Push Roller						
Spring return— E50DT3	E50AT36P CE	E50ALT36P	E50ANT36P	E50BT36P	E50BLT36P	E50BNT36P

Wobble Head, Spring Return



Description	Assembled Switch Catalog Number			Assembled Switch Catalog Number		
Wobble Head, Spring Return (requires a wobble operator, see Page V8-T2-80)						
Standard duty— E50DW1	E50AW16P CE	E50ALW16P	E50ANW16P	E50BW16P	E50BLW16P	E50BNW16P
Heavy-duty high strength steel— E50DW2	E50AW26P CE	E50ALW26P	E50ANW26P	E50BW26P	E50BLW26P	E50BNW26P

Circuit Diagrams, see Page V8-T2-77.

Notes

① Connection options (add the code suffix from the table below to the end of the catalog number):

Option		Catalog Number	Code Suffix
Mini-connector ③	Single-pole (5-pin mini-connector)	CSMS5D5CY1602	C
	Double-pole (9-pin mini-connector)	CSMS9D9CY1602	C
Cable connection	12 ft cable length (standard)	—	12
	20 ft cable length (standard)	—	20
	Other lengths (special order)	—	Length in ft








② For operating head specifications, see Page V8-T2-72.

③ For a full selection of connector cables, see Tab 10, section 10.1.

Operating Heads

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E50 Heavy-Duty Factory Sealed 6P+ Switches, Operating Heads



Description	Travel to Operate Contacts	Travel to Reset Contacts	Total Travel	Force to Operate Contacts	Minimum Return Force	Operating Temperature ^①		Catalog Number
						Without Cable	With Pre-wired Cable	
Side Rotary (requires an operating lever, see Page V8-T2-80)								
 Standard spring return ^②	5°	2°	90°	3 in-lbs	4.5 in-oz	10° to 200°F (-12° to 94°C) ^③	10° to 200°F (-12° to 94°C) ^③	E50DR1
Low temperature spring return ^②	5°	2°	90°	3 in-lbs	4.5 in-oz	-40° to 175°F (-40° to 79°C)	-31° to 175°F (-34° to 79°C)	E50DR19
Low force spring return ^②	15°	6°	90°	1.5 in-lbs	2.5 in-oz	10° to 200°F (-12° to 94°C) ^③	10° to 200°F (-12° to 94°C) ^③	E50DL1
Maintained two-position	50°	50°	90°	3 in-lbs	—	14° to 200°F (-10° to 94°C)	14° to 200°F (-10° to 94°C)	E50DM1
Side Pushbutton								
 Spring return	0.065 in	0.030 in	0.250 in	4 lbs	8 oz	14° to 200°F (-10° to 94°C)	14° to 200°F (-10° to 94°C)	E50DS1
 Adjustable Spring Return	0.065 in	0.030 in	0.250 in	4 lbs	8 oz	14° to 200°F (-10° to 94°C)	14° to 200°F (-10° to 94°C)	E50DS2
Side Push Roller								
 Spring return ^④	0.065 in	0.030 in	0.250 in	4 lbs	8 oz	14° to 200°F (-10° to 94°C)	14° to 200°F (-10° to 94°C)	E50DS3 ^⑤
	0.065 in	0.030 in	0.250 in	4 lbs	8 oz	14° to 200°F (-10° to 94°C)	14° to 200°F (-10° to 94°C)	E50DS4 ^⑤
Side Pushbutton								
 Maintained	0.200 in	0.130 in	0.320 in	5 lbs	5 lbs	14° to 200°F (-10° to 94°C)	14° to 200°F (-10° to 94°C)	E50DH1
Top Pushbutton								
 Spring return	0.040 in	0.020 in	0.280 in	4 lbs	8 oz	14° to 250°F (-10° to 121°C)	14° to 221°F (-10° to 105°C)	E50DT1
 Adjustable Spring Return	0.040 in	0.020 in	0.280 in	4 lbs	8 oz	14° to 250°F (-10° to 121°C)	14° to 221°F (-10° to 105°C)	E50DT2

Notes

- ① Temperature ranges below 32°F (0°C) are based on absence of freezing moisture or water.
- ② CW (clockwise) and CCW (counterclockwise) operation, easily convertible to CW only or CCW only operation.
- ③ For CW and CCW operation. For CW only or CCW only operation, high temperature limit increases to 250°F (121°C) without cable, and 221°F (105°C) with pre-wired cable.
- ④ Roller can be converted in the field between horizontal and vertical.
- ⑤ Roller shaft is 0.38 in (9.5 mm) longer on E50DS4, see Dimensions on **Page V8-T2-78**.

E50 Heavy-Duty Factory Sealed 6P+ Switches



E50 Heavy-Duty Factory Sealed 6P+ Switches, Operating Heads, continued

Description	Travel to Operate Contacts	Travel to Reset Contacts	Total Travel	Force to Operate Contacts	Minimum Return Force	Operating Temperature ^①		Catalog Number
						Without Cable	With Pre-Wired Cable	
Top Push Roller	Top Push Roller							
 Spring return	0.040 in	0.020 in	0.280 in	4 lbs	8 oz	14° to 250°F (-10° to 121°C)	14° to 221°F (-10° to 105°C)	E50DT3
Wobble Head, Spring Return	Wobble Head, Spring Return (requires a wobble operator, see Page V8-T2-80)							
 Standard duty	10°	6°	15°	2 in-lbs	2.4 in-oz	14° to 250°F (-10° to 121°C)	14° to 221°F (-10° to 105°C)	E50DW1
Heavy-duty high strength steel	10°	6°	15°	2 in-lbs	2.4 in-oz	14° to 250°F (-10° to 121°C)	14° to 221°F (-10° to 105°C)	E50DW2

Circuit Diagrams, see [Page V8-T2-77](#).

Switch Bodies

E50 Heavy-Duty Factory Sealed 6P+, Switch Bodies

Circuit	Switch Body Construction	Cable Length	Catalog Number
Pre-Wired Cable	Pre-Wired Cable		
 Single-pole 1NO-1NC	Without indicating light	8 ft	E50SA6P
		12 ft	E50SA6P12
		20 ft	E50SA6P20
	With LED indicating light 24–120 Vac/dc	8 ft	E50SAL6P
		12 ft	E50SAL6P12
		20 ft	E50SAL6P20
	With neon indicating light 120 Vac	8 ft	E50SAN6P
		12 ft	E50SAN6P12
		20 ft	E50SAN6P20
Two-pole 2NO-2NC	Without indicating light	8 ft	E50SB6P
		12 ft	E50SB6P12
		20 ft	E50SB6P20
	With LED indicating light 24–120 Vac/dc	8 ft	E50SBL6P
		12 ft	E50SBL6P12
		20 ft	E50SBL6P20
	With neon indicating light 120 Vac	8 ft	E50SBN6P
		12 ft	E50SBN6P12
		20 ft	E50SBN6P20
Mini-Connector	Mini-Connector		
 Single-pole 1NO-1NC	Without indicating light normal wiring	—	E50SA6PC ☼
	Without indicating light alternate wiring	—	E50SA6PC-W ☼
	With LED indicating light 24–120 Vac/dc	—	E50SAL6PC ☼
	With neon indicating light 120 Vac	—	E50SAN6PC ☼
Two-pole 2NO-2NC	Without indicating light	—	E50SB6PC ☼
	With LED indicating light 24–120 Vac/dc	—	E50SBL6PC ☼
	With neon indicating light 120 Vac	—	E50SBN6PC ☼

Notes




☼ See listing of compatible connector cables on [Page V8-T2-74](#).

① Temperature ranges below 32°F (0°C) are based on absence of freezing moisture or water.

Compatible Connector Cables



2

Standard Cables ^①

	Current Rating at 600V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	Catalog Number
Mini-Style, Straight Female 	Mini-Style, Straight Female						
	8A	—	5-pin	16 AWG	6 ft (2m)	 <ul style="list-style-type: none"> 1-White 2-Red 3-Green 4-Orange 5-Black 	CSMS5D5CY1602
	7A	—	9-pin	16 AWG	12 ft (4m)	 <ul style="list-style-type: none"> 1-Orange 2-Blue 3-Red/Black 4-Green/Black 5-White 6-Red 7-Green 8-White/Black 9-Black 	CSMS9D9CY1602

Accessories

E50 Heavy-Duty Factory Sealed 6P+ Switch Accessories




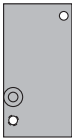
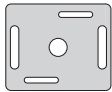

		Catalog Number
E50KH1M 	Adapter Plate	
	Allows E50 to replace Eaton's 10316 Type LP Manifold Mounting Plug-In Limit Switch	E50KH1M
E50KH7 	Allows E50 to replace Square D Type AW Surface Mounting Non Plug-In Standard Box Limit Switch	E50KH7

Dimensions, see **Page V8-T2-78**.

Note

^① For a full selection of connector cables, see **Tab 10, section 10.1**.

E50 Heavy-Duty Factory Sealed 6P+ Switch Accessories, continued

		Catalog Number
Adapter Plate, continued		
E50KH4 	Allows E50 to replace National Acme, Type D-1200M, Style 2 Mounting. Denison LoxSwitch, Model L-100W, Style 2 Mounting. Square D 9007 Type T, Style B Mounting. (Adapter plate is 1/8 in thick, with 1/4 in mounting holes.) Namco® long mount.	E50KH4 ①
E50KH5 	Allows E50 to replace National Acme, Type D-1200M, Style 1 Mounting. Denison LoxSwitch, Model L-100W, Style 1 Mounting. Square D 9007 Type T, Style C Mounting. (Adapter plate is 1/8 in thick, with 1/4 in mounting holes.)	E50KH5 ①
E50KH2 	Allows E50 to replace Eaton's 10316 Type LT Non Plug-In Two-Pole Limit Switch	E50KH2
E50KH10 	Allows E50 to replace Allen-Bradley 802M Sealed Limit Switch	E50KH10
Adjustable Mounting Plate		
E50KH3 	This is a mounting plate only 5/16 in thick and includes the proper mounting bolts and nuts. The slots in the plate allow a maximum horizontal adjustment of 1 in and vertical adjustment of 1-1/4 in	E50KH3 ①
Conduit Sealing Nut		
E50KH6 	1/2 in oiltight	E50KH6
Dimensions , see Page V8-T2-78 .		

Note

① Limit switch not included.

Technical Data and Specifications

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E50 Heavy-Duty Factory Sealed 6P+ Switches

Description	Specification
Environmental ratings	NEMA 1, 3, 3S, 4, 4X, 6, 6P, 13, IP67, IP69K
Material of construction	Zinc die cast
Switch gasket material	Viton
Universal U.S./DIN mounting dimensions	1.16 in (30 mm) x 2.34 in (60 mm)
Conduit entrance	1/2 in NPT or 20 mm threading
Contact ratings	See below
Contact operation	Snap action over center mechanism
Contact material	Fine silver
Maximum frequency of operation	8000 operations per hour
Mechanical life	
Side rotary	13,000,000 operations minimum
Side or top push	10,000,000 operations minimum
Electrical life	
Single-pole	1,000,000 operations typical at full load
Double-pole	100,000 operations typical at full load
Ambient temperature range—standard	
Standard without cable	14° to 250°F (–10° to 121°C)
Standard with cable	14° to 221°F (–10° to 105°C)
Low temperature without cable	–40° to 250°F (–40° to 121°C)
Low temperature with cable	–40° to 221°F (–40° to 105°C)
Repeat accuracy—standard	
Side operated	Within 0.0012 in
Top operated	Within 0.0003 in
Side rotary	Within 0.0014 in
Torque requirements	
Operating head screws	14–18 lb-in

Electrical Data—Maximum Contact Ratings (Same polarity each pole)

AC Volts	Current, Amperes			Voltamperes		DC Volts	Current, Amperes		
	Make	Break	Cont. ①	Make	Break		Max. Make or Break	Cont. ①	
All Switches Except Gravity Return and Indicating Light Versions									
NEMA A600 Rating						NEMA R300			
120	60	6	10	7200	720	125	0.22	1.0	
240	30	3	10	7200	720	250	0.11	1.0	
480	15	1.5	10	7200	720	250	0.11	1.0	
600	12	1.2	10	7200	720	250	0.11	1.0	
Switches with Indicating Lights (LED or Neon)									
NEMA A150 Rating						NEMA R150			
120	60	6	10	7200	720	125	0.22	1.0	

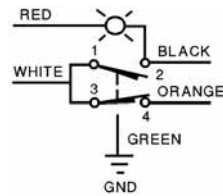
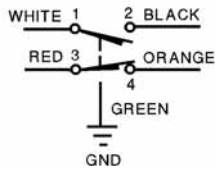
Note

① Thermal rating. Valid only if switch does not have to make or break.

Circuit Diagrams ①

Standard Assembled Switches

Single-Pole 1NO-1NC

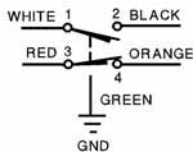


Must be same polarity.

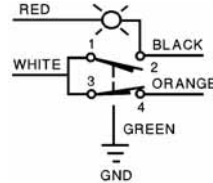
Switch Bodies

**Pre-Wired Cable—
Single-Pole 1NO-1NC**

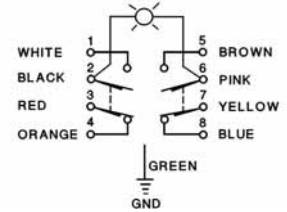
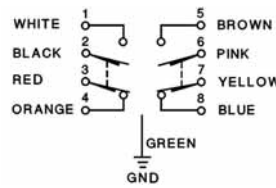
E50SA6P_



E50SAL6P_



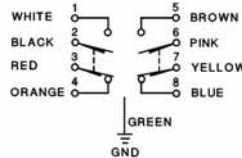
Two-Pole 2NO-2NC



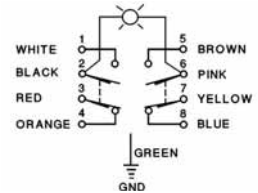
Same polarity, each pole.

**Pre-Wired Cable—
Two-Pole 2NO-2NC**

E50SB6P_



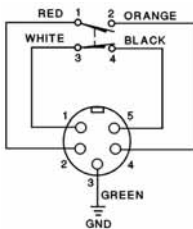
E50SBL6P_



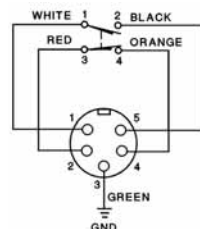
Wiring Diagrams ①

Mini-Connector—Single-Pole 1NO-1NC

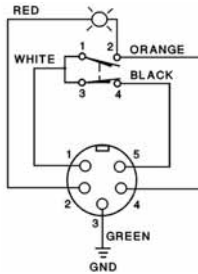
E50SA6PC



E50SA6PC-W

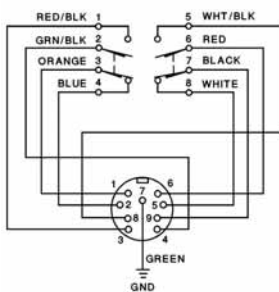


E50SAL6PC/E50SAN6PC

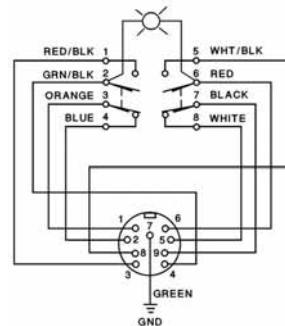


Mini-Connector—Two-Pole 2NO-2NC

E50SB6PC



E50SBL6PC/E50SBN6PC



Note

① The wire colors referenced on these diagrams are those internal to the switch itself.

2.7

Limit Switches

E50 Heavy-Duty Factory Sealed 6P+ Switches

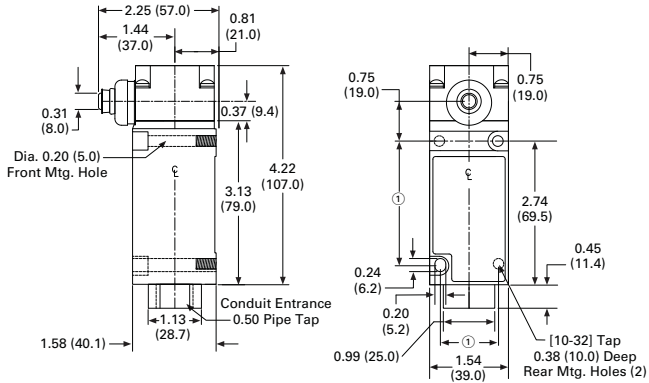
Dimensions

Approximate Dimensions in Inches (mm)

2

Standard

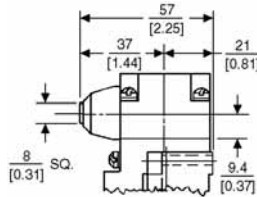
6P+ Limit Switch with Rotary Operating Head



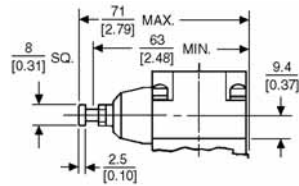
Side Push Operators

Approximate Dimensions in mm [in]

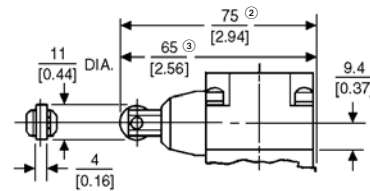
Pushbutton



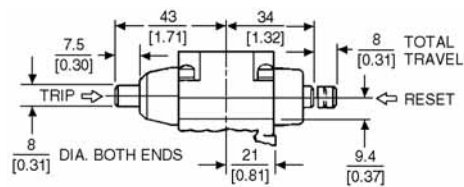
Adjustable Pushbutton



Roller

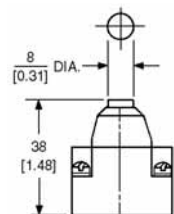


Maintained Pushbutton

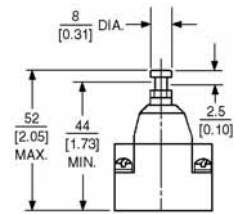


Top Push Operators

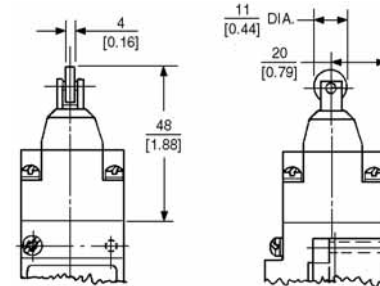
Pushbutton



Adjustable Pushbutton



Roller



Wobble Operators

See Operators on **Page V8-T2-80**.

Notes

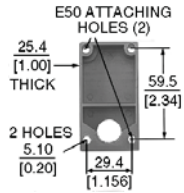
- ① Can accommodate both U.S., 1.16 (29.4) x 2.34 (59.5) and DIN, 1.18 (30.0) x 3.26 (60.0), mounting dimensions.
- ② For E50DS4.
- ③ For E50DS3.

Accessories

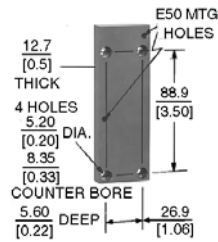
Approximate Dimensions in mm [in]

Adapter Plates

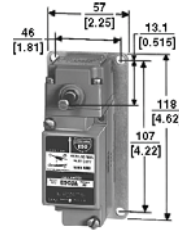
E50KH1M



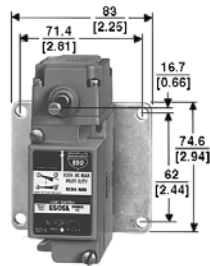
E50KH7



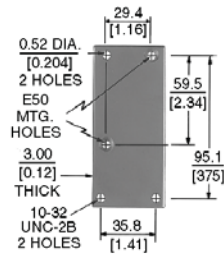
E50KH4



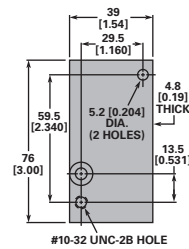
E50KH5



E50KH2



E50KH10



Adjustable Mounting Plate

E50KH3

