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 miniconnectors. 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.947.5.1
- 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 safetyrelated 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











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Indicating Light: Switch Body:

None E50SA6P 1NO-1NC

Assembled Switch

(24-120 Vac/dc) E50SAL6P 1NO-1NC

E50ALS16P

E50ALS26P

(120 Vac) E50SAN6P 1NO-1NC

E50ANR16P

E50ANS16P

E50ANS26P

Neon

Neon None (24–120 Vac/dc) (120 Vac) E50SBL6P E50SBN6P E50SB6P 2NO-2NC 2NO-2NC 2NO-2NC

E50BLR16P

E50BLM16P

E50BLS16P

Assembled Switch **Catalog Number**

E50BR16P

Operating Head Type ② Side Rotary



2	Description	Catalog Numbe	r	
	Side Rotary (requ	uires an operatin	g lever, see Page V8	B-T2-80)
	Standard spring return—E50DR1 ^③	E50AR16P	E50ALR16P	E50

Low force spring

return—E50DL1 3

E50AR16P
C€

E50AL16P (€









E50BNM16P

E50BNS16P

E50BNR16P

Maintained twoposition-E50DM1

Spring return-

E50DS1

Side Pushbutton



E50AS16P

C€

E50ALM16P E50ANM16P

E50BS16P

E50BM16P

Spring Return











E50BS26P

E50BLS26P

E50BNS26P



Circuit Diagrams, see Page V8-T2-77.

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	С
	Two-pole (9-pin mini-connector)	CSMS9D9CY1602	С
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.
- 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	hlne	separately
revei	SUIU	separatery

Single-Pole Indicating Light: None

Neon (120 Vac)

E50SAN6P

1NO-1NC

LED Neon (24–120 Vac/dc) (120 Vac) E50SBL6P E50SBN6P

2NO-2NC

Switch Body:

1NO-1NC 1NO-1NC Assembled Switch

LED

(24–120 Vac/dc)

E50SAL6P

Assembled Switch Catalog Number

Two-Pole

E50SB6P

2NO-2NC

None

Operating Head Type ②

Side Push Roller





E50ANS36P E50ALS36P



Description

g return—	E50AS36P
33 ③	CE

E50SA6P

Catalog Number

E50BS36P E50BLS36P



2NO-2NC

Side Pushbutton



Side	Pushbutton
------	------------

Maintained-	
E50DH1	

E50AH16P (€

E50ALH16P E50ANH16P E50BH16P

E50BLH16P E50BNH16P







Spring return-E50DT1

E50AT16P ϵ

E50ALT16P E50ANT16P E50BT16P

E50BLT16P

E50BNT16P





Adjustable spring return—E50DT2

E50AT26P (€

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	С
	Two-pole (9-pin mini-connector)	CSMS9D9CY1602	С
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.
- 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









old separately	Indicating Light:	None

Switch Body:

LED (24-120 Vac/dc) None E50SA6P E50SAL6P 1NO-1NC 1NO-1NC

Single-Pole

Two-Pole

None	LED (24–120 Vac/dc)	Neon (120 Vac)
E50SB6P	E50SBL6P	E50SBN6
2NO-2NC	2NO-2NC	2NO-2NC

Operating Head Type $^{\scriptsize \textcircled{2}}$

Assembled Switch Description **Catalog Number**

Assembled Switch **Catalog Number**

Top Push Roller







E50ALT36P E50ANT36P

Neon

(120 Vac)

E50SAN6P

1NO-1NC

E50BT36P E50BLT36P E50BNT36P

Wobble Head, Spring Return



Standard duty— E50DW1	E50AW16P C €	E50ALW16P	E50ANW16P	E50BW16P	E50BLW16P	E50BNW16P
Heavy-duty high strength	E50AW26P	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 [®]	Single-pole (5-pin mini-connector)	CSMS5D5CY1602	С
	Double-pole (9-pin mini-connector)	CSMS9D9CY1602	С
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

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

		Travel to	Travel to		Force to	Minimum	Operating Temperature ①		
	Description	Operate Contacts	Reset Contacts	Total Travel	Operate Contacts	Return Force	Without Cable	With Pre-wired Cable	Catalog Number
ide Rotary	Side Rotary (requires a	n operating leve	r, 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) ®	E50DR1
9	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								
pring Return	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
djustable Spring eturn	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
de Push Roller	Side Push Roller	0.005 :	0.020 :	0.050 :	A ll-	0	140 to 2000F	140 +- 2000	Franca
	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
91		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 ®
de Pushbutton	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								
oring Return	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
djustable Spring	Adjustable spring return	0.040 in	0.020 in	0.280 in	4 lbs	8 oz	14° to 250°F	14° to 221°F	E50DT2
eturn							(–10° to 121°C)	(–10° to 105°C)	

Notes

- $^{\scriptsize \textcircled{\tiny 1}}$ Temperature ranges below 32°F (0°C) are based on absence of freezing moisture or water.
- $@ \ \ \mathsf{CW} \ (\mathsf{clockwise}) \ \mathsf{and} \ \mathsf{CCW} \ (\mathsf{counterclockwise}) \ \mathsf{operation}, \ \mathsf{easily} \ \mathsf{convertible} \ \mathsf{to} \ \mathsf{CW} \ \mathsf{only} \ \mathsf{or} \ \mathsf{CCW} \ \mathsf{only} \ \mathsf{operation}.$
- ® 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.
- $^{\small \bullet}$ Roller can be converted in the field between horizontal and vertical.
- © 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

	Travel to Travel to Force to Operate Reset Total Operate Contacts Contacts Travel Contacts	Travel to	Force to	Minimum	Uperating Temperature U			
Description		Return Force	Without Cable	With Pre-Wired Cable	Catalog Number			
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 Re	turn (require	s a wobble o	perator, see	Page V8-T2-	80)			
Wobble Head, Spring Ret	turn (require	s a wobble o	perator, see 15°	Page V8-T2-t	80) 2.4 in-oz	14° to 250°F (-10° to 121°C)	14° to 221°F (-10° to 105°C)	E50DW1

Switch Bodies

	Circuit	Switch Body Construction	Cable Length	Catalog Number				
Pre-Wired Cable	Pre-Wired Cable	Pre-Wired Cable						
	Single-pole 1NO-1NC	Without indicating light	8 ft	E50SA6P				
			12 ft	E50SA6P12				
1			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				
		With neon indicating light 120 Vac	8 ft	E50SBN6P				
			12 ft	E50SBN6P12				
			20 ft	E50SBN6P20				
ni-Connector	Mini-Connector							
diam.	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 ♠				

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

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, St	traight Fema	le				
8A	_	5-pin	16 AWG	6 ft (2m)	1-White 2-Red 3-Green 4-Orange 5-Black	CSMS5D5CY1602
7A	_	9-pin	16 AWG	12 ft (4m)	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

0	Avenue	- (
п				
6				
R	2	0.00	3	
		V	7	

Catalog Number

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 E50KH7
Limit Switch

Dimensions, see Page V8-T2-78.

Note

Adapter Plate

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

E50 Heavy-Duty Factory Sealed 6P+ Switches

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



E50KH2





Allows E50 to replace Allen-Bradley 802M Sealed Limit Switch

E50KH10

E50KH3



Adjustable Mounting Plate
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

E50KH3 ①

E50KH6



adjustment of 1-1/4 in

E50KH6



Dimensions, see Page V8-T2-78.

Note

1 Limit switch not included.

Technical Data and Specifications

E50 Heavy-Duty Factory Sealed 6P+ Switches

nvironmental ratings	NEMA 1, 3, 3S, 4, 4X, 6, 6P, 13, IP67, IP69K
invironinional ratings	NEIVIA 1, 3, 33, 4, 4A, 0, 0F, 13, IF07, IF09K
Material of construction	Zinc die cast
witch gasket material	Viton
Iniversal U.S./DIN mounting dimensions	1.16 in (30 mm) x 2.34 in (60 mm)
onduit entrance	1/2 in NPT or 20 mm threading
ontact ratings	See below
ontact operation	Snap action over center mechanism
ontact 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
lectrical life	
Single-pole	1,000,000 operations typical at full load
Double-pole	100,000 operations typical at full load
mbient 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)
epeat accuracy—standard	
Side operated	Within 0.0012 in
Top operated	Within 0.0003 in
Side rotary	Within 0.0014 in
orque requirements	
Operating head screws	14–18 lb-in

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

	Current, A	Current, Amperes			res	Current, Amperes		
AC Volts	Make	Break	Cont. ①	Make	Break	DC Volts	Max. Make or Break	Cont. ①
All Switch	es Except Gr	avity Return	and Indicatir	ng Light Ver	sions			
NEMA A600 F	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 v	with Indication	ng Lights (LE	D or Neon)					
NEMA A150 F	Rating					NEMA R150		
120	60	6	10	7200	720	125	0.22	1.0

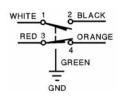
Note

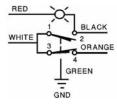
 $^{{}^{\}scriptsize\textcircled{\scriptsize\textbf{1}}}$ Thermal rating. Valid only if switch does not have to make or break.

Circuit Diagrams 1

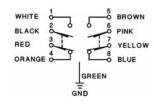
Standard Assembled Switches

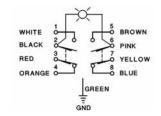
Single-Pole 1NO-1NC





Two-Pole 2NO-2NC



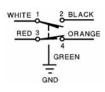


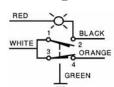
Must be same polarity.

Switch Bodies

Pre-Wired Cable — Single-Pole 1NO-1NC

E50SA6P



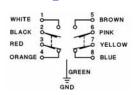


E50SAL6P

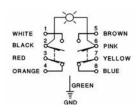
Pre-Wired Cable — Two-Pole 2NO-2NC

Same polarity, each pole.

E50SB6P



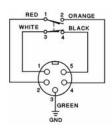




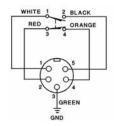
Wiring Diagrams ¹

Mini-Connector - Single-Pole 1NO-1NC

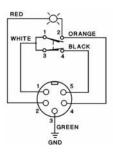
E50SA6PC







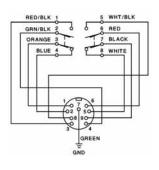
E50SAL6PC/E50SAN6PC

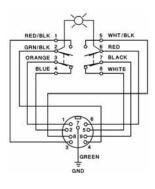


Mini-Connector - Two-Pole 2NO-2NC

E50SB6PC

E50SBL6PC/E50SBN6PC





Note

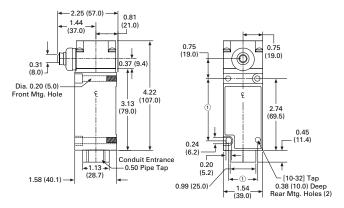
① The wire colors referenced on these diagrams are those internal to the switch itself.

Dimensions

Approximate Dimensions in Inches (mm)

Standard

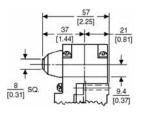
6P+ Limit Switch with Rotary Operating Head



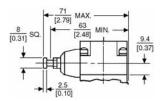
Side Push Operators

Approximate Dimensions in mm [in]

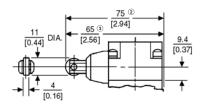
Pushbutton



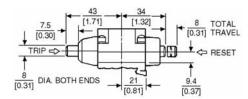
Adjustable Pushbutton



Roller

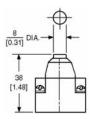


Maintained Pushbutton

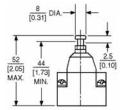


Top Push Operators

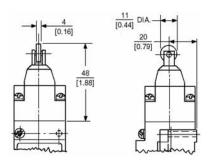
Pushbutton



Adjustable Pushbutton



Roller



Wobble Operators

See Operators on Page V8-T2-80.

Notes

- $^{\scriptsize\textcircled{1}}$ 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

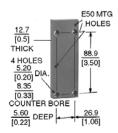
Approximate Dimensions in mm [in]

Adapter Plates

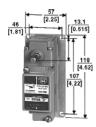
E50KH1M



E50KH7



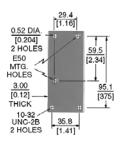
E50KH4



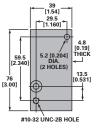
E50KH5



E50KH2



E50KH10



Adjustable Mounting Plate

E50KH3

