

EVN2000 Series Limit Switch



Features

- Innovative wiring system featuring insulation displacement termination (IDT)
- Integrated cable gland/cord grip
- EN 50047 mounting compatible
- Designed to meet switch requirement within EN 81-1
- Snap action basic switch with 4 mm air gap
- IP 66/67 Enclosure rating, EN 60529. NEMA 1, 12, 13
- Direct opening of Normally Closed contacts conforming to IEC/EN 60947-5-1 annex K
- Double insulated switch element
- Compact plastic housing

Description

The EVN2000 series limit switch is an innovative product which has been developed to address a need highlighted by Original Equipment Manufacturers (OEM), where “Ease of Wiring” is required. With the new design there is no need for access to the inside of the housing and therefore the housing cover, cover screws and gasket become obsolete. Furthermore, the integrated cable gland eliminates the need for additional conduit or cable gland hardware.

Benefits

- Reduced wiring time, up to 50 % savings can be achieved
- Provides a truly global product by removing the need for conduit or cable gland hardware
- Meets globally accepted mounting standard
- Meets switch requirements within “Safety rules for the construction and installation of elevators/lifts”
- 1 Normally Closed, 1 Normally Open circuit conforming to EN 81-1
- Suitable for wet applications
- Forced opening of the normally closed circuit in the event of contacts welding
- No earth connection required, internal or external
- Suitable where space is at a premium

Typical applications

- Elevators and moving stairs
- Scissor/platform lifts
- Overhead doors
- Material handling
- Packaging machinery
- Agricultural equipment



WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalogue) is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.



WARNING

IF USED IN APPLICATIONS CONCERNING HUMAN SAFETY

- Only use NC direct opening (“positive opening”/ “positive break”) contacts, identified by the symbol .
- Do NOT use flexible / adjustable actuators. Only use actuators designed for safety applications.
- Do NOT defeat, tamper, remove, or bypass this switch.
- Hazardous voltage, disconnect power before servicing.
- Strictly adhere to all installation instructions.
- Consult with local safety agencies and their requirements when designing a machine-control link, interface and all control elements that affect safety.

Failure to comply with these instructions could result in death or serious injury.

EVN2000 Series Limit Switch

Technical information

Specifications

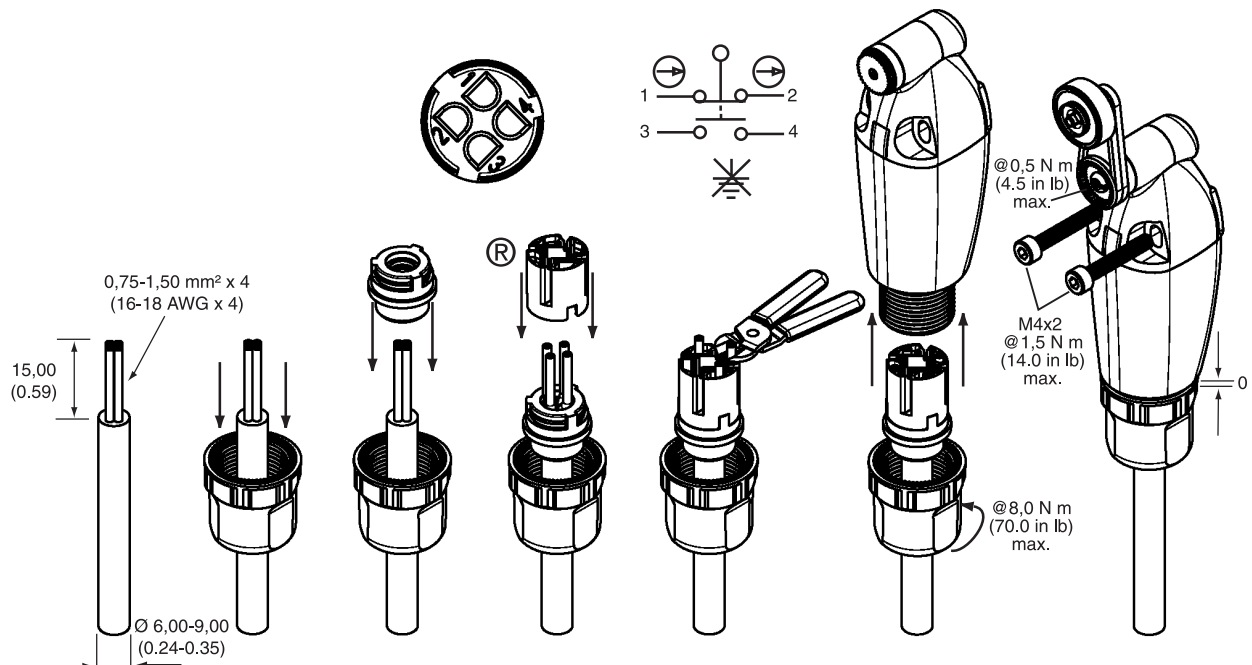
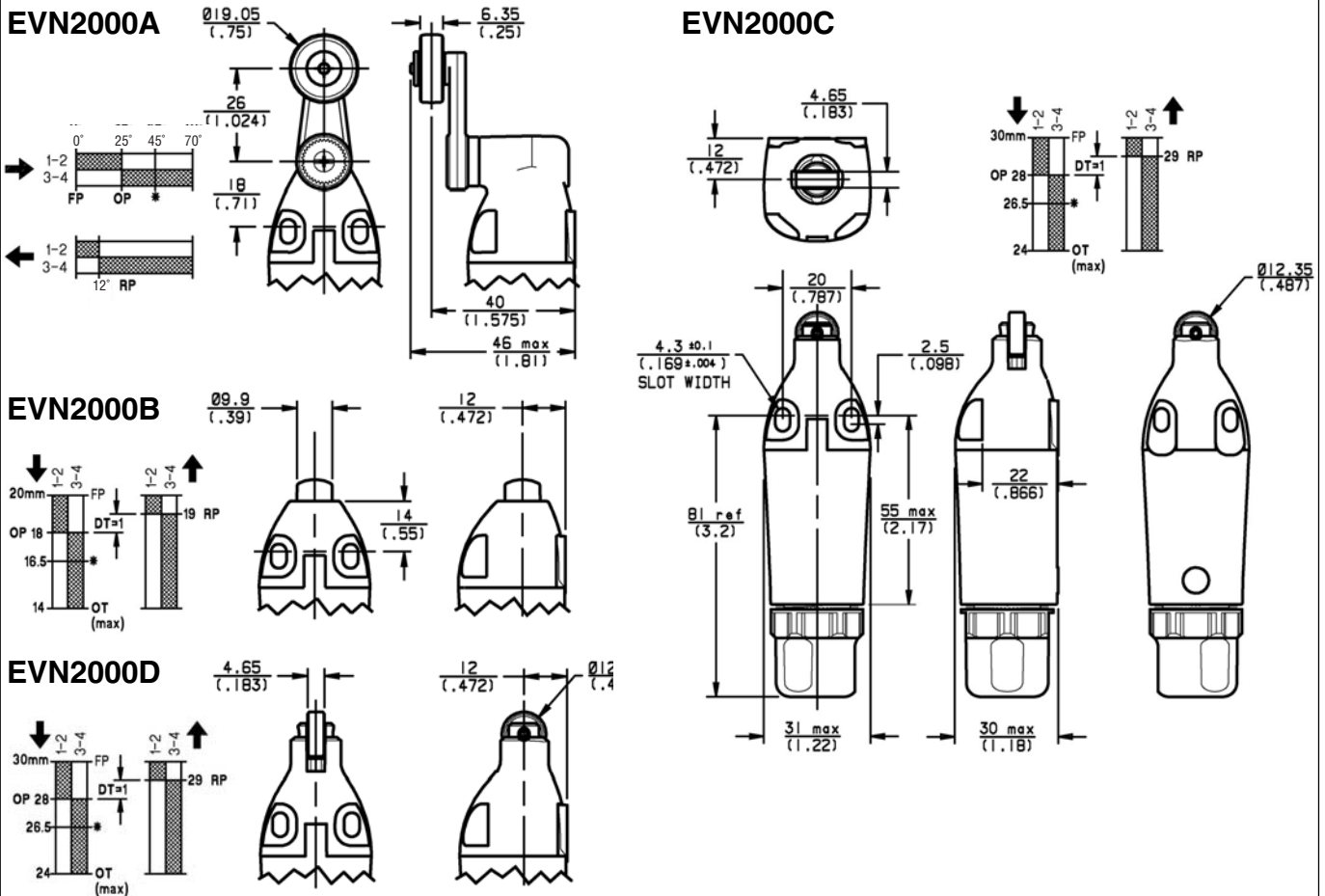
Mechanical life:	up to 10 million operations		
Degree of protection:	IP 66/67, EN 60529 NEMA/UL type 1, 12, 13		
Operating temperature:	-25 °C to 85 °C (-13 °F to 185 °F)		
Storage temperature:	-40 °C to 85 °C (-40 °F to 185 °F)		
Standards/approvals:	IEC/EN 60947-5-1 - European standard for electromechanical industrial control equipment EN 50047 - European standard for designing limit switches UL 508 - US standard for industrial control equipment UL 746C - US standard for plastic enclosures EN 60529 - European standard for IP codes EN 81-1 - European standard for electrical lifts		
Electrical rating: IEC/EN 60947-5-1	Rated operational current I _e (A) at rated operational voltage U _e		VA rating
	120 V	240 V	Make
	6	3	7200
	125 V	250 V	Break
AC15, A300	0.55	0.27	69
DC13, Q300			69
Rated insulation voltage : (Dielectric)	320 V		
Rated impulse withstand:	2500 V		
Polution degree:	3		
Thermal current:	10 A		
Short circuit withstand:	SCPD 10 A quick acting fuse (IEC 269.1 gG-type)		
Contact material:	Silver		
Circuit type:	1NO/1NC Direct opening Single pole, single throw, double break Contact type Zb - the 2 contact elements are electrically separated		
Cable/leadwire:	Outside cable Ø 6.0 mm to 9.0 mm (0.24 in to 0.35 in) Leadwire 0,75 mm ² to 1,5 mm ² (16-18 AWG)		
Shock:	50 g conforming to IEC 68-2-27 (BS 2011, Part 2.1 Ea) (actuator not fitted)		
Vibration:	10 g conforming to IEC 68-2-6 (BS 2011, Part 2.1 Fc) (actuator not fitted)		
Bump:	40 g conforming to IEC 68-2-29 (BS 2011, Part 2 LeB)		

Order guide

Description	Catalogue Listing
Side Rotary Lever	EVN2000A
Top Pin Plunger	EVN2000B
Top Roller Plunger, Parallel	EVN2000C
Top Roller Plunger, Perpendicular	EVN2000D

EVN2000 Series Limit Switch

Mounting drawings in mm and (inches)



Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective material and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during that period of coverage, Honeywell will repair or replace without charge those items it finds defective. **The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

While we provide application assistance, personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change at any time without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

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MICRO SWITCH™

GLL Series

Limit Switches




DESCRIPTION

Honeywell MICRO SWITCH™ GLL Series limit switches are part of the OEM set of miniature limit switches. They combine and enhance MICRO SWITCH™ GLS and SZL-VL switches into one common family, competitively priced for OEM applications.

The double insulated compact housing conforms to EN500047 and makes GLL Series switches often ideal for mounting where space is at a premium. These products feature direct opening normally closed circuits.

FEATURES

- Double break, direct-opening snap action contacts conform to IEC 60947-5-1-3 
- EN50047 mounting
- 20 mm and 1/2 in NPT conduit options
- Galvanically isolated contacts
- Double insulated plastic housing
- Snap action and slow action circuitry
- Contact block integral to switch housing
- Hinge cover for easy wiring access
- 50 mm rubber rollers ideal for elevator applications
- Sealing IP66; NEMA 1, 12, 13
- c-UL-US, CE, CCC
- rOhs compliant

The MICRO SWITCH™ GLL Series is available in a variety of actuator styles required for OEM applications. Designed to the IEC electrical standard, GLL is suitable for world-wide use and also meets globally accepted mounting standards.

The GLL Series provides a cost-effective solution for OEM high volume applications and enables manufacturers to be competitive in today's demanding business environment.

POTENTIAL APPLICATIONS

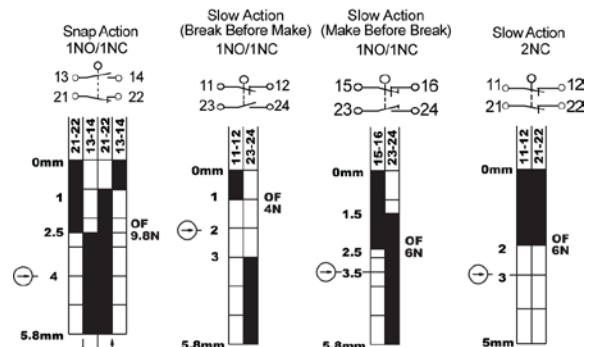
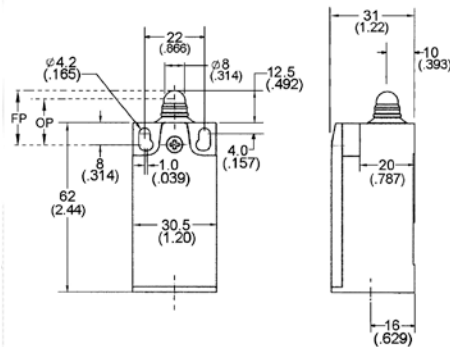
- Elevators
- Escalators
- Aerial/platform lifts
- Industrial doors
- Packaging equipment

MICRO SWITCH™ GLL Series

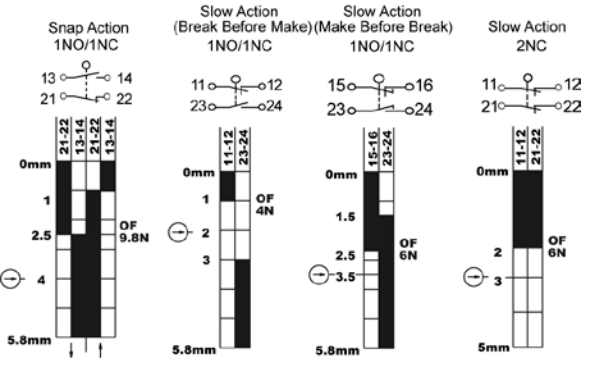
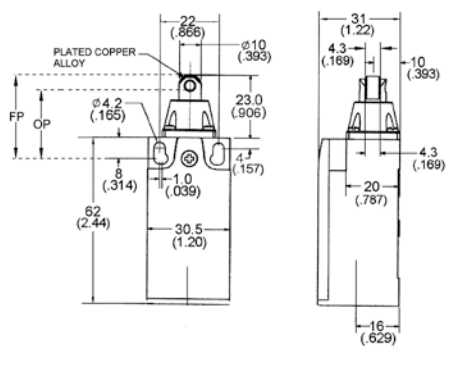
SPECIFICATION DATA

Circuitry	1 NO 1 NC direct opening snap action, slow action (BBM), slow action (MBB); 2NC slow action
Ampere rating	10 A (Thermal)
Supply voltage	300 Vac and 250 Vdc max.
Housing material	Plastic
Termination type	12,7 mm [0.5 in] conduit; 20 mm [0.79 in] conduit
Housing type	EN 50047
Shock	50 g per PEC 68-2-27c (w/o actuator)
Vibration	10 g per IEC 68-2-6 (w/o actuator)
Sealing	IP66; NEMA 1, 12, 13
Approvals	c-UL-US, CE, CCC
Mechanical life	5 million operations
Operating temperature range	-10 °C to 80 °C [14 °F to 176 °F]

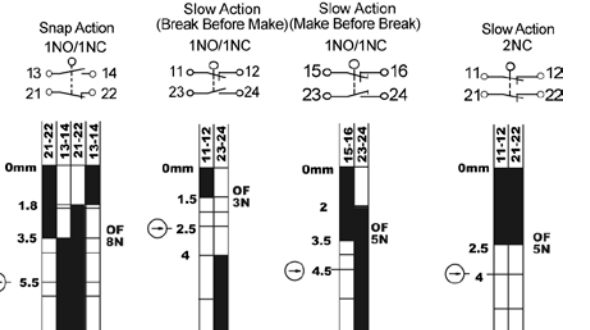
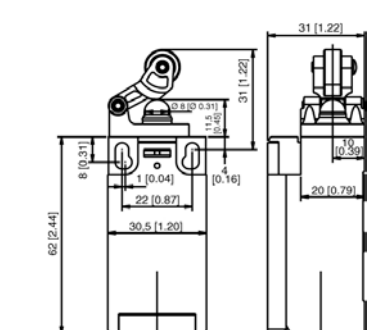
GLLA**B, GLLC**B



GLLA**C, GLLC**C

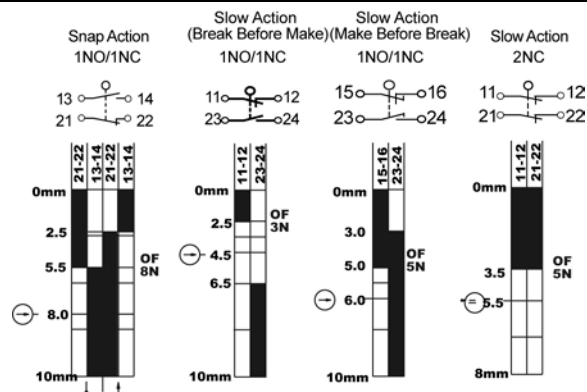
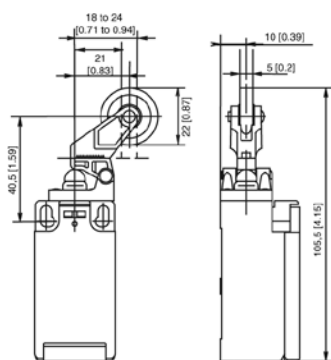


GLLA**D, GLLC**D

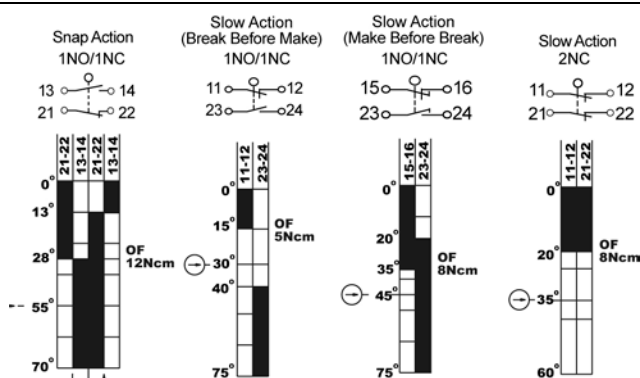
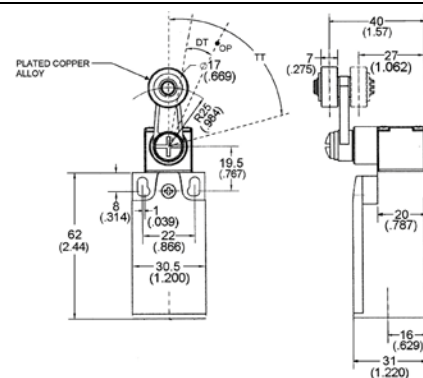


Limit Switches

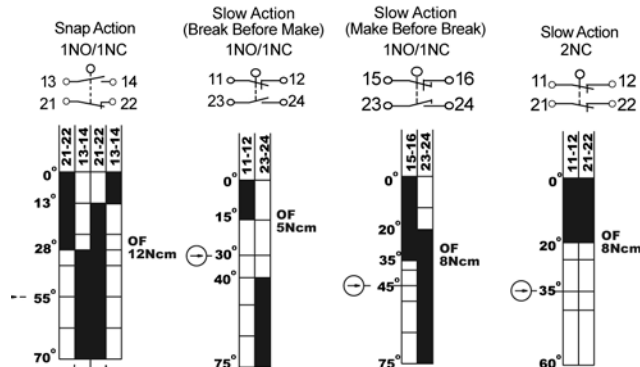
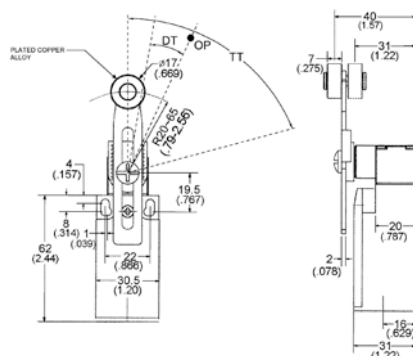
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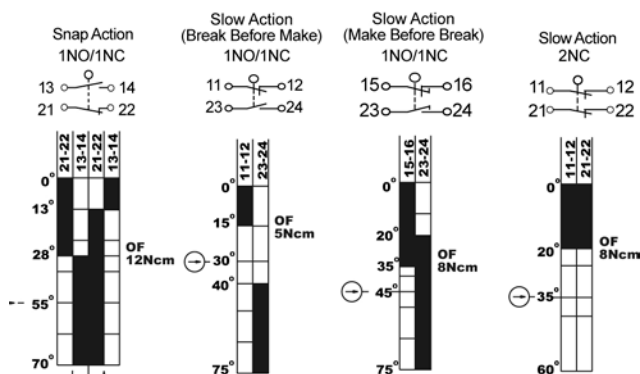
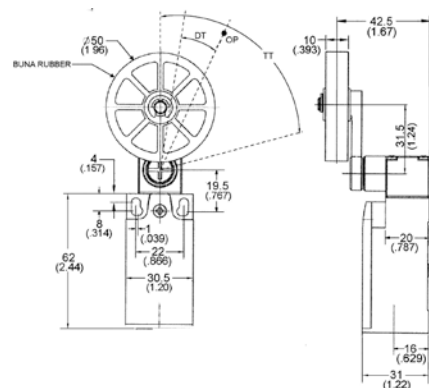
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GLLA**A2B, GLLC**A2B

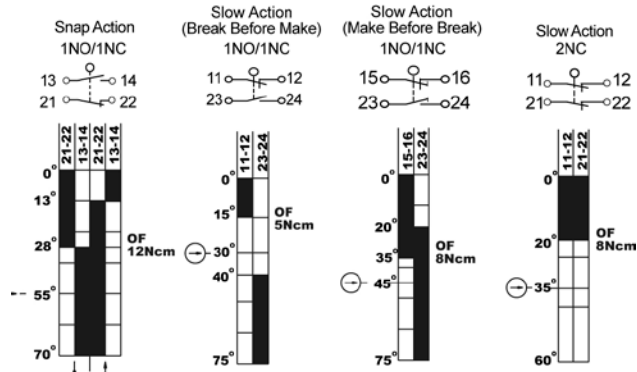
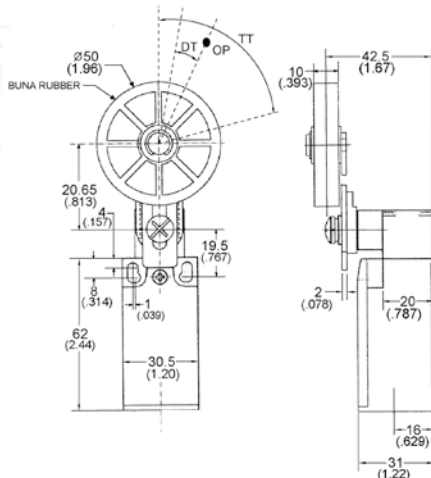


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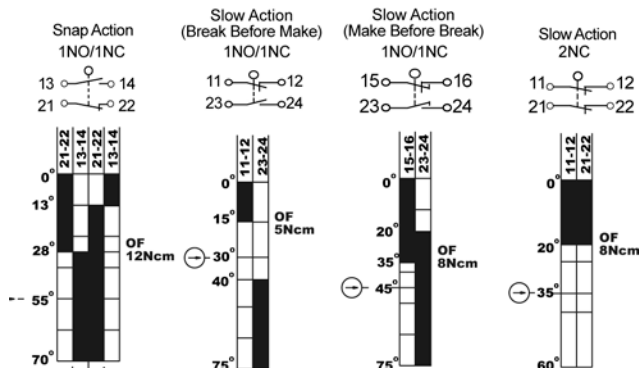
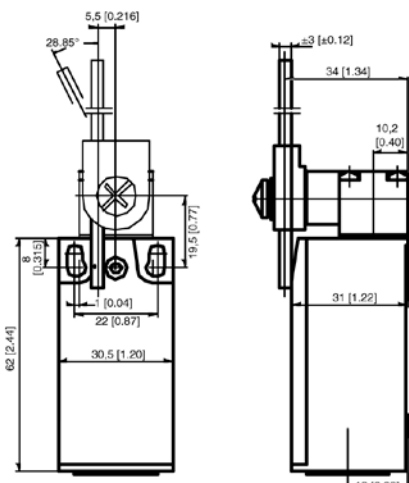


MICRO SWITCH™ GLL Series

GLLA**A2Y, GLLC**A2Y

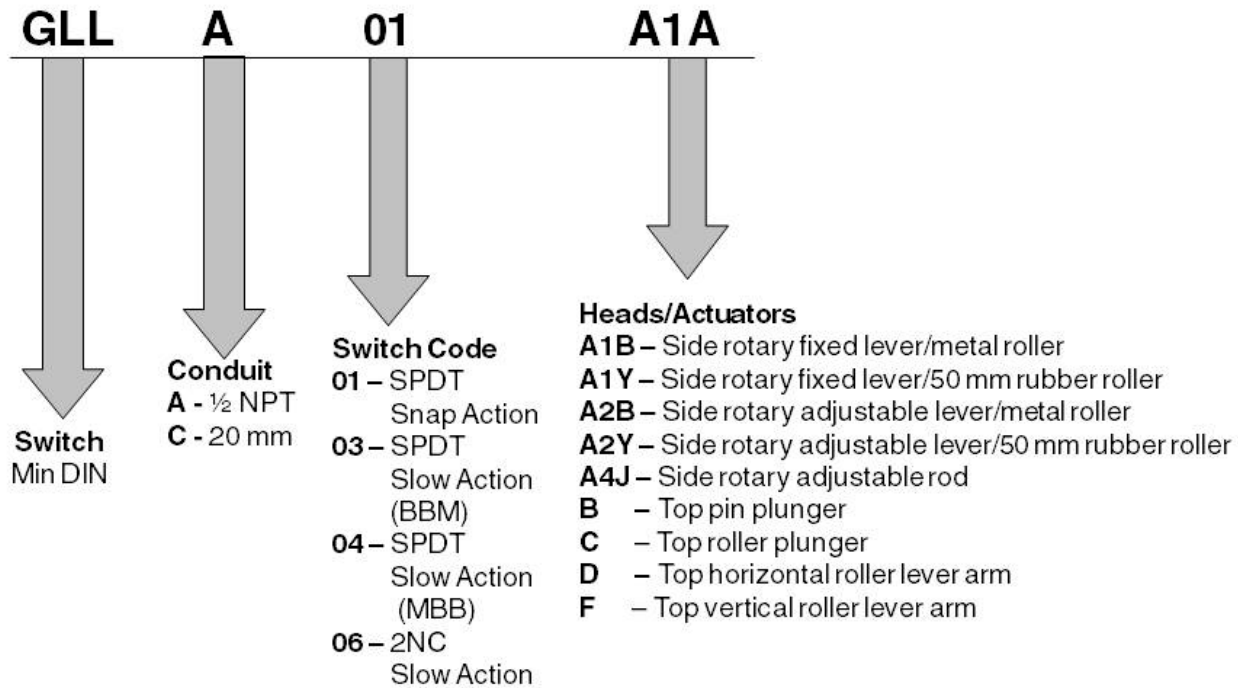


GLLA**A4J, GLLC**A4J



Limit Switches

MICRO SWITCH™ GLL MIN-DIN (EN500047) PLASTIC



WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

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Honeywell

MICRO SWITCH™ GLS Series

Miniature Global Limit Switch



DESCRIPTION

GLS miniature limit switches are designed to provide a complete range of globally approved products. These rugged and reliable limit switches are often suitable for most industrial applications.

Side rotary versions offer a unique dual-bearing design which prevents side loading during application. The compact housing size makes them often ideal for mounting where space is at a premium. The extensive product range offers the user a choice of plastic, metal, and three conduit version housing, which are all mounting compatible to EN50047. A wide range of actuator and circuitry options makes it easy for the user to customize a switch to the particular application.

FEATURES

- Double break, direct-opening contacts conform to IEC 60947-5-1-3 (except on 2NO models)
- Dual bearing design on side rotary shaft
- Choice of rugged metal or double-insulated plastic housings
- Full range of actuator heads and levers
- Snap action, slow action basic switches
- Gold contact versions available
- Galvanically isolated contacts (Form Zb)
- Sealing up to IP67/NEMA 4
- CE, UL, CSA, CCC
- -40 °C [-40 °F] standard construction for side rotary and plunger styles

POTENTIAL APPLICATIONS

- Elevators and moving stairs
- Scissor/platform lifts
- Material handling
- Packaging machinery
- Agricultural and machine tool equipment

LOW-ENERGY SWITCHING

In today's demanding age of low-energy controls, electromechanical switches are frequently used to interface directly with PLCs and other low-energy devices. To accommodate this requirement, GLS offers a gold-plated version of the standard basic switch. This improves reliability of switching at low currents and voltages by protecting the contact surfaces from contamination during operation or storage prior to use. Standard silver contacts have the disadvantage in that the contact surface may tarnish under certain environmental conditions (e.g., presence of moisture). Low energy basic switches are rated as follows:

Operating Voltage U_e 1 Vac/Vdc to 50 Vac/Vdc
Operating Current I_e 1 microamp to 100 mA

Electrical Ratings

IEC 947-5-1 / EN 90947-5-1									
Designation & Utilization Category		Rated operational current I_e (A) at rated operational voltage U_e						VA Rating	
		120 V	240 V	380 V	480 V	500 V	600 V	Make	Break
AC15	A600	6	3	1.9	1.5	1.4	1.2	7200	720
AC15	A300	6	3	—	—	—	—	7200	720
AC15	B300	3	1.5	—	—	—	—	3600	360
AC14	D300	0.6	0.3	—	—	—	—	432	72
		125 V	250 V						
DC13	Q300	0.55	0.27					69	69
DC13	R300	0.22	0.1					28	28

BENEFITS

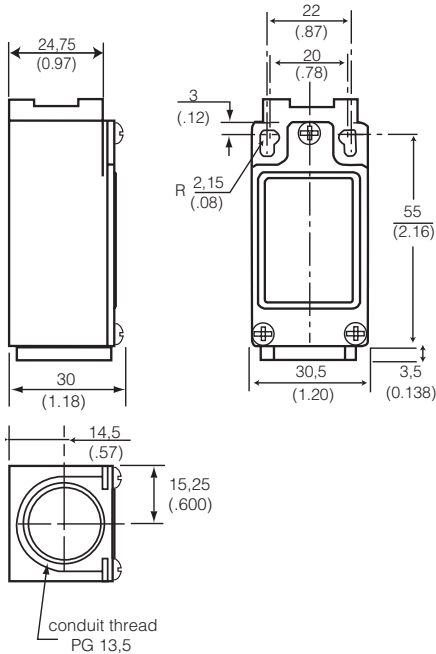
- Forced opening of the normally closed circuitry in the event of contacts welding (on all models except 2NO)
- Meets globally accepted mounting standards
- Prevents side loading
- Design flexibility
- Can be applied for both logic level and power-duty loads
- Each contact throw can accept a different voltage (SPDT versions)
- Suitable for outdoor environments
- Designed to IEC electrical standard for world-wide use



GLC EN 50047 Metal standard

Technical data

Mechanical life	up to 15 million operations
Degree of protection	IP67 (wobble IP66) NEMA/UL type 1, 4, 12, 13
Temperature range	Operating : -40 °C to 85 °C [-40 °F to 185 °F] Storage : -40 °C to 85 °C -40 °F to 185 °F
Approvals	IEC 60947-5-1 EN 60947-5-1 AC15 A300 DC13 Q300 UL & CSA
Vibration	10 g conforming to IEC 68-2-6
Shock	50 g conforming to IEC 68-2-27 Terminal marking to EN 50013



Conduit thread

A	= 1/2 in NPT adaptor
B	= PG 13,5
C	= 20 mm

Ordering :

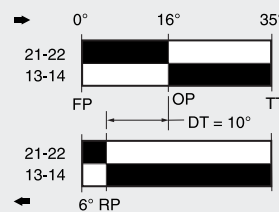
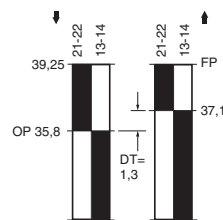
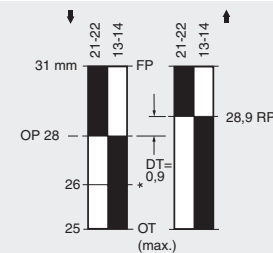
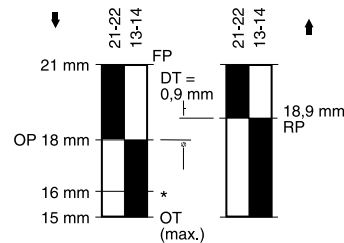
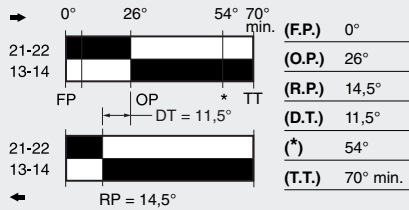
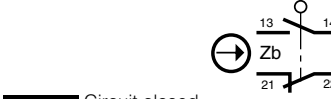
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2 Honeywell • Sensing and Control

Snap-Action Contacts

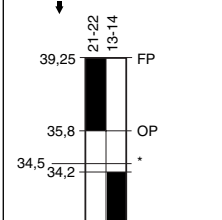
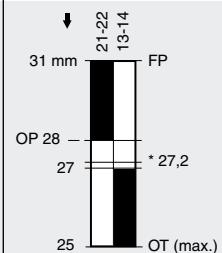
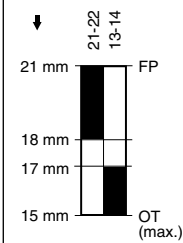
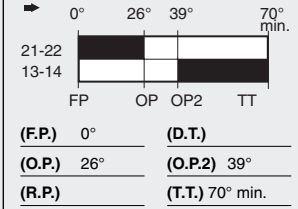
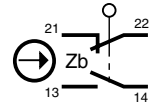
1 NORMALLY CLOSED / 1 NORMALLY OPEN



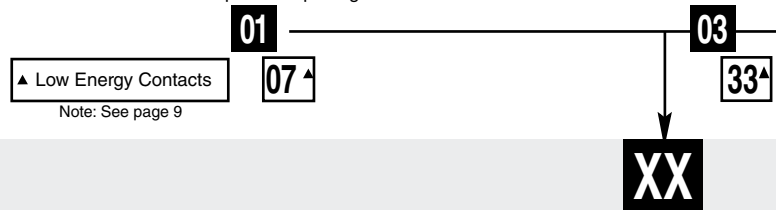
Slow-Action Contacts

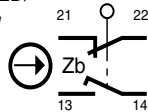
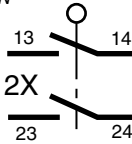
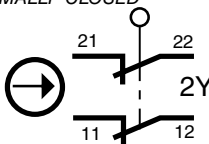
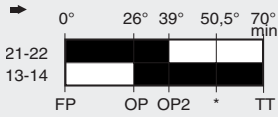
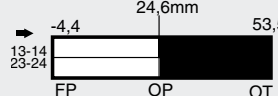
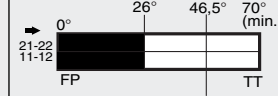
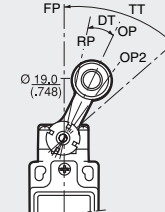
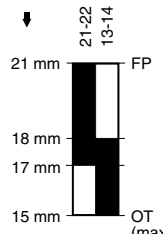
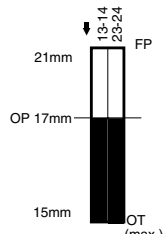
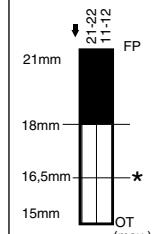
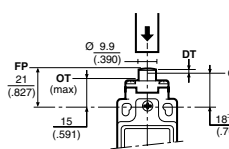

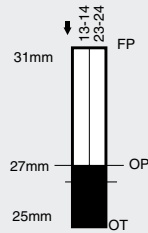
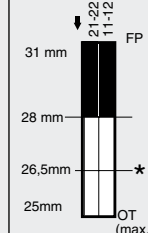
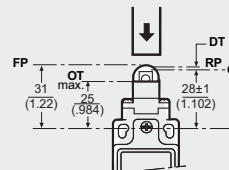
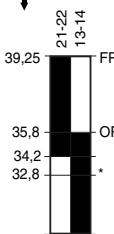
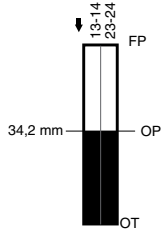
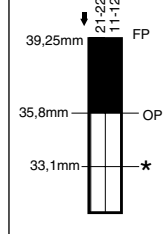
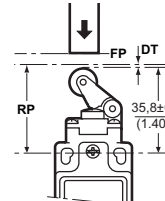
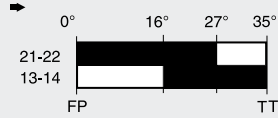
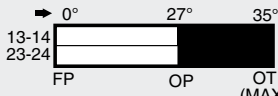
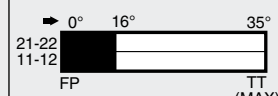
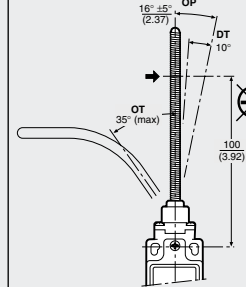
BREAK-BEFORE-MAKE

1 NORMALLY CLOSED /
1 NORMALLY OPEN



* Point from which the positive opening is assured



Slow-Action Contacts	Slow-Action Contacts	Slow-Action Contacts		Actuator Types
MAKE BEFORE BREAK 1 NORMALLY CLOSED/ 1 NORMALLY OPEN 	2 NORMALLY OPEN 	2 NORMALLY CLOSED 	Operating Torque	
 (F.P.) 0° (D.T.) (O.P.) 26° (O.P.2) 39° (R.P.) (T.T.) 70° min. (*) 50,5	 (F.P.) 0° (O.P.) 36° (O.T.) 61° to 75°	 (F.P.) 0° (D.T.) (O.P.) 26° (*) 46.5° (R.P.) (O.T.) 70° min.	0,330 Nm [2.90 lb]	 A1B Side Rotary, Metal Roller
			16,0 Nm [3.60 lb]	 B Top Pin Plunger
			16,0 Nm [3.60 lb]	 C Top Roller Plunger
			9,5 Nm [2.10 lb]	 D Top Roller Lever
			0,1 Nm [0.90 lb]	 E7B Coil Wobble Stick

04

34^Δ

05

35^Δ

06

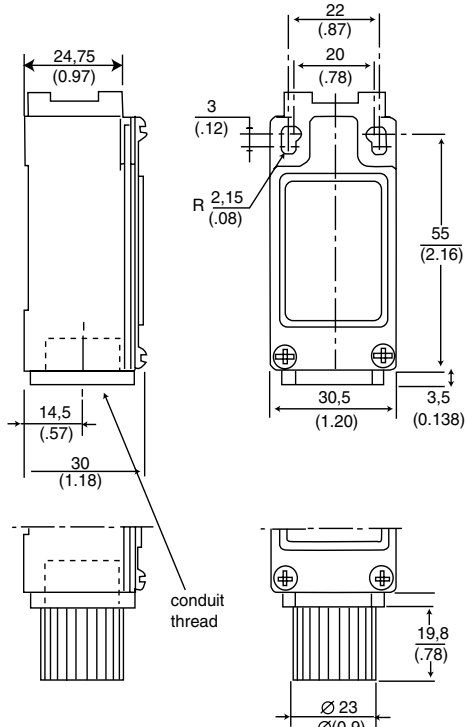
36^Δ

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GLD EN 50047 Double insulated standard

Technical data

Mechanical life	up to 15 million operations
Degree of protection	IP66, IP67 NEMA/UL type 1, 4X (indoor use), 12, 13
Temperature range	Operating : -40 °C to 85 °C [-40 °F to 185 °F] Storage : -40 °C to 85 °C -40 °F to 185 °F
Approvals	IEC/EN 60947-5-1 EN 60947-5-1 AC15 A300 DC13 Q300 UL & CSA
Vibration	10 g conforming to IEC 68-2-6
Shock	50 g conforming to IEC 68-2-27 Terminal marking to EN 50013



Conduit thread

- A** = 1/2 in NPT adaptor
- B** = PG 13,5
- C** = 20 mm

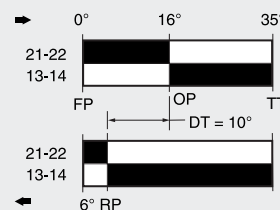
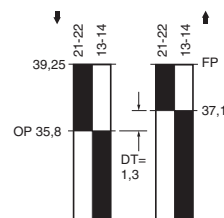
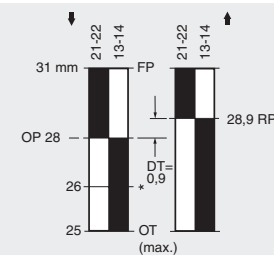
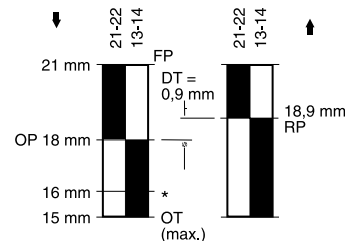
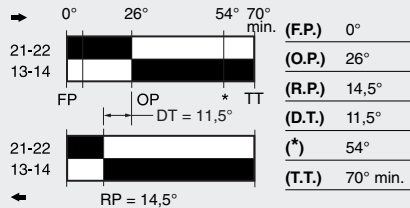
Ordering :

GLD

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Snap-Action Contacts

1 NORMALLY CLOSED / 1 NORMALLY OPEN



* Point from which the positive opening is assured

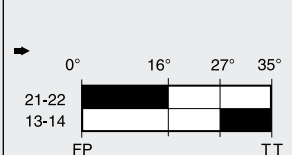
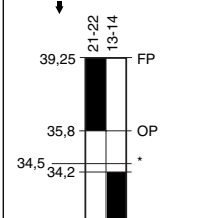
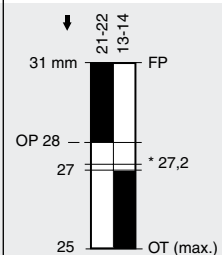
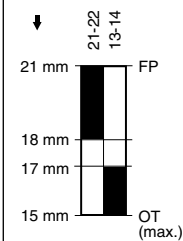
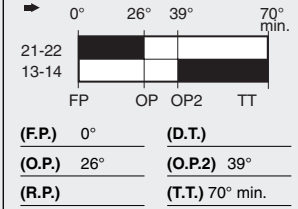
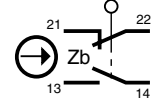
▲ Low Energy Contacts

Note: See page 9

Slow-Action Contacts

BREAK-BEFORE-MAKE

1 NORMALLY CLOSED /
1 NORMALLY OPEN



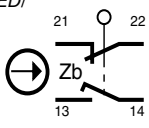
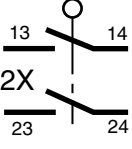
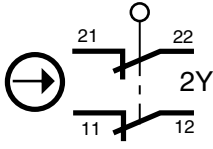
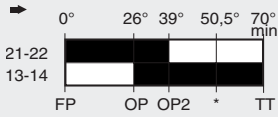
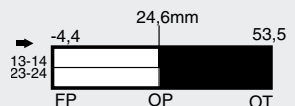
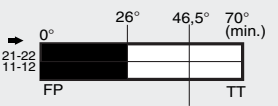
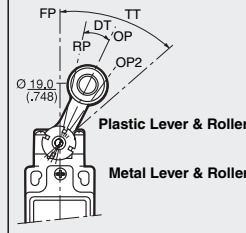
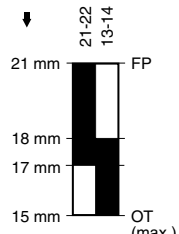
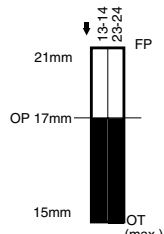
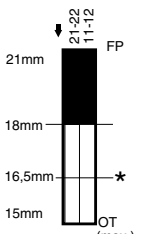
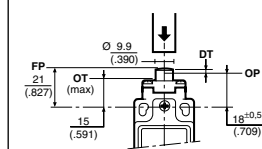

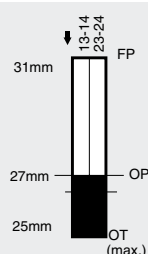
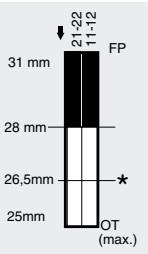
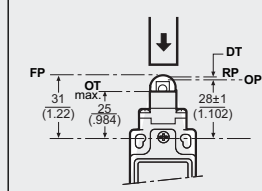
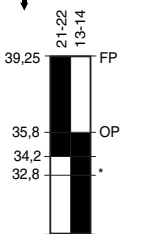
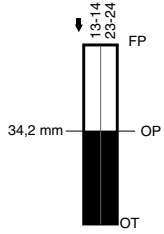
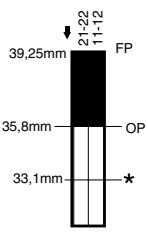
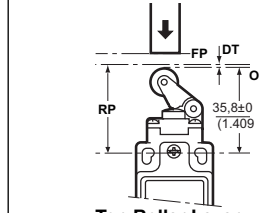
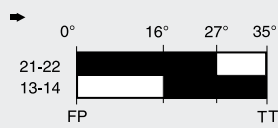
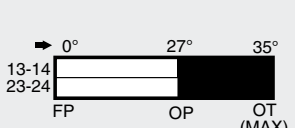
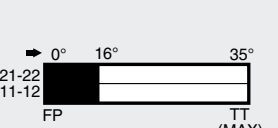
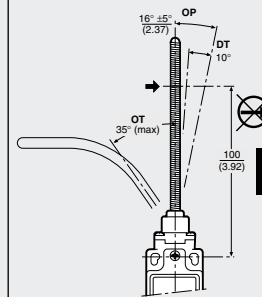
01

03

07

33

XX

Slow-Action Contacts	Slow-Action Contacts	Slow-Action Contacts		Actuator Types
MAKE BEFORE BREAK 1 NORMALLY CLOSED/ 1 NORMALLY OPEN 	2 NORMALLY OPEN 	2 NORMALLY CLOSED 	Operating Torque	
 (F.P.) 0° (D.T.) (O.P.) 26° (O.P.2) 39° (R.P.) (T.T.) 70° min. (*) 50,5	 (F.P.) 0° (O.P.) 36° (O.T.) 61° to 75°	 (F.P.) 0° (D.T.) (O.P.) 26° (*) 46.5° (R.P.) (O.T.) 70° min.	0,330 Nm [2.90 lb]	 A1A A1B
			16,0 Nm [3.60 lb]	 B
			16,0 Nm [3.60 lb]	 C
			9,5 Nm [2.10 lb]	 D
			0,1 Nm [0.90 lb]	 E7B

04

34[▲]

05

35[▲]

06

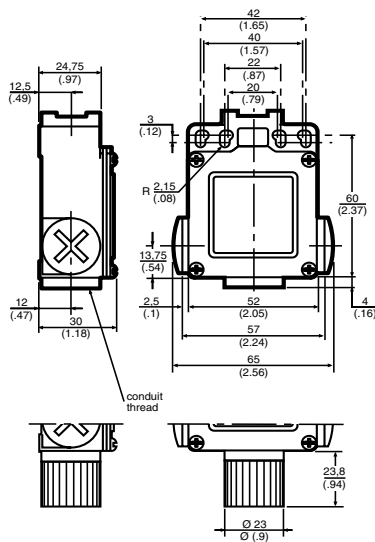
36[▲]

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GLE EN 50047 Compatible 3 conduit metal standard

Technical data

Mechanical life	up to 15 million operations
Degree of protection	IP67 (wobble IP66) NEMA/UL type 1, 4, 12, 13
Temperature range	Operating : -40 °C to 85 °C [-40 °F to 185 °F] Storage : -40 °C to 85 °C -40 °F to 185 °F
Approvals	IEC 60947-5-1 EN 60947-5-1 AC15 A300 DC13 Q300 UL & CSA
Vibration	10 g conforming to IEC 68-2-6
Shock	50 g conforming to IEC 68-2-27 Terminal marking to EN 50013



Conduit thread

A = 1/2 in NPT adaptor

B = PG 13,5

C = 20 mm

Ordering :

GLE **X**

6 Honeywell • Sensing and Control

Snap-Action Contacts	Slow-Action Contacts	Slow-Action Contacts																																								
1 NORMALLY CLOSED/ 1 NORMALLY OPEN	BREAK-BEFORE-MAKE 1 NORMALLY CLOSED / 1 NORMALLY OPEN	MAKE BEFORE BREAK 1 NORMALLY CLOSED/ 1 NORMALLY OPEN																																								
<p>Circuit closed * Positive opening to IEC/EN 60947-5-1-3</p>																																										
<table><tr><td>(F.P.)</td><td>0°</td><td>(D.T.)</td><td>11,5°</td></tr><tr><td>(O.P.)</td><td>26°</td><td>(*)</td><td>54°</td></tr><tr><td>(R.P.)</td><td>14,5°</td><td>(T.T.)</td><td>70° min.</td></tr></table>	(F.P.)	0°	(D.T.)	11,5°	(O.P.)	26°	(*)	54°	(R.P.)	14,5°	(T.T.)	70° min.	<table><tr><td>(F.P.)</td><td>0°</td><td>(D.T.)</td><td></td></tr><tr><td>(O.P.)</td><td>26°</td><td>(O.P.2)</td><td>39°</td></tr><tr><td>(R.P.)</td><td></td><td>(T.T.)</td><td>70° min.</td></tr></table>	(F.P.)	0°	(D.T.)		(O.P.)	26°	(O.P.2)	39°	(R.P.)		(T.T.)	70° min.	<table><tr><td>(F.P.)</td><td>0°</td><td>(D.T.)</td><td></td></tr><tr><td>(O.P.)</td><td>26°</td><td>(O.P.2)</td><td>39°</td></tr><tr><td>(R.P.)</td><td></td><td>(T.T.)</td><td>70° min.</td></tr><tr><td>(*)</td><td>50,5</td><td></td><td></td></tr></table>	(F.P.)	0°	(D.T.)		(O.P.)	26°	(O.P.2)	39°	(R.P.)		(T.T.)	70° min.	(*)	50,5		
(F.P.)	0°	(D.T.)	11,5°																																							
(O.P.)	26°	(*)	54°																																							
(R.P.)	14,5°	(T.T.)	70° min.																																							
(F.P.)	0°	(D.T.)																																								
(O.P.)	26°	(O.P.2)	39°																																							
(R.P.)		(T.T.)	70° min.																																							
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(O.P.)	26°	(O.P.2)	39°																																							
(R.P.)		(T.T.)	70° min.																																							
(*)	50,5																																									

* Point from which the positive opening is assured

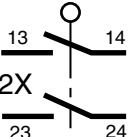
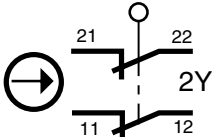
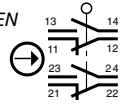
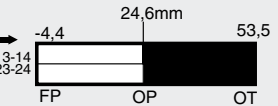
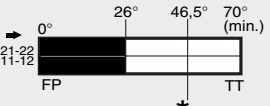
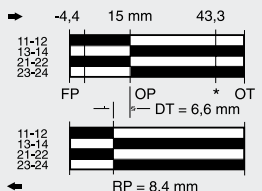
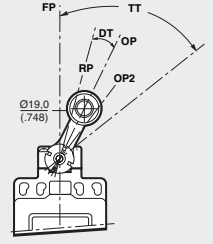
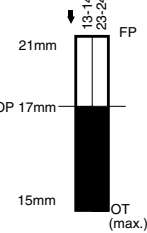
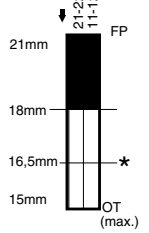
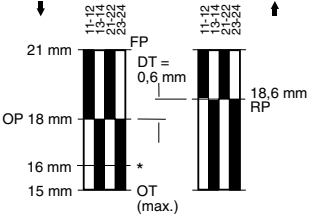
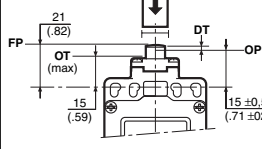
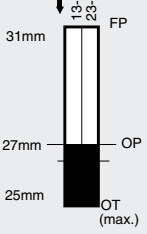
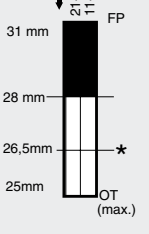
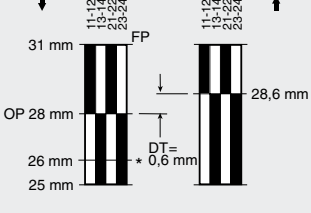
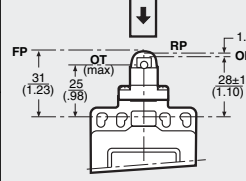
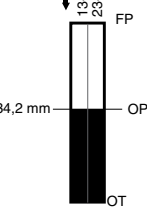
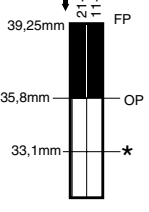
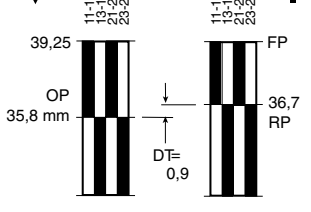
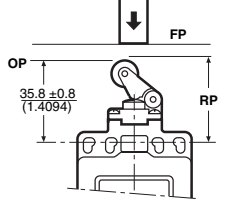
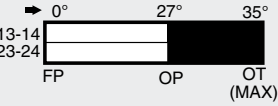
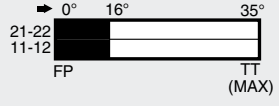
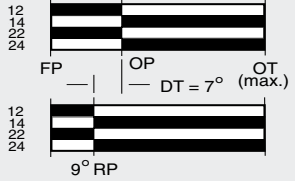
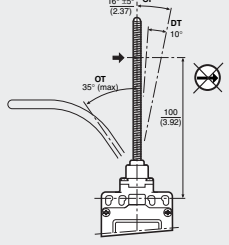
▲ Low Energy Contacts
Note: See page 9

01
07

03
33

04
34

XX

Slow-Action Contacts	Slow-Action Contacts	Snap-Action Contacts	Operating torque/force	Actuator Types
2 NORMALLY OPEN 	2 NORMALLY CLOSED 	DOUBLE POLE 2 2 NORMALLY CLOSED/ 2 NORMALLY OPEN 	SPDT DPDT	
 (F.P.) 0° (O.P.) 36° (O.T.) 61° to 75°	 (F.P.) 0° (O.P.) 26° (R.P.) (D.T.) 70° min.	 (F.P.) 0° (O.P.) 26° (R.P.) 180° (D.T.) 8°	0,330 Nm [2.90 lb] 0,120 Nm [1.10 lb]	 Side Rotary, Metal Roller
			16,0 Nm [3.60 lb] 16,0 Nm [3.60 lb]	 Top Pin Plunger
			16,0 Nm [3.60 lb] 16,0 Nm [3.60 lb]	 Top Roller Plunger
			9,5 Nm [2.10 lb] 11,0 Nm [2.4 lb]	 Top Roller Lever
			0,1 Nm [0.90 lb] 1,3 Nm [0.29 lb]	 Coil Wobble Stick

05

35^A

06

36^A

24

32^A

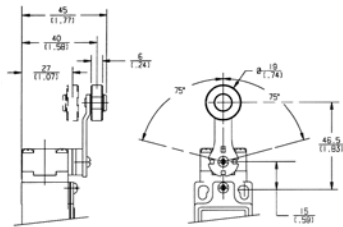
XXX

Additional lever types

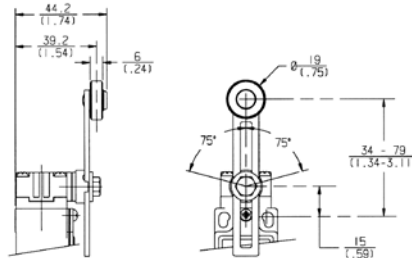
For use with all Side Rotary Head Styles.

Figure 1 illustrates miniature product lever types conforming to EN 50047 while **Figure 2** illustrates standard product lever types with conform to EN 50041. All dimensions are in mm/inches).

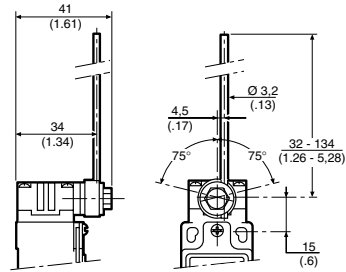
GLC, GLD, GLE (EN 50047)



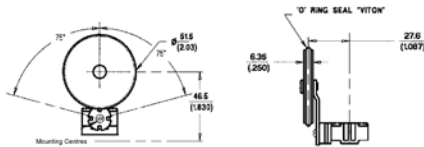
Side Rotary Roller Lever; A1A Plastic Roller
A1B Metal Roller



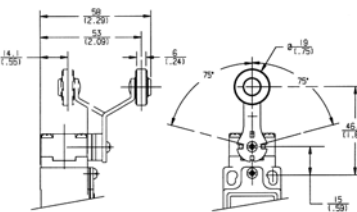
Side Rotary Adjustable Lever; A2A Plastic
Roller; A2B Metal Roller



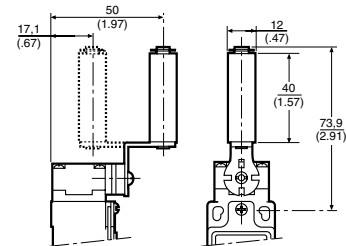
Side Rotary Adjustable Rod
A4J Metal Rod Head



A1Y Large Fixed Plastic Roller
(Suitable for Elevator Applications)



Offset Side Rotary Roller Lever; A5A Plastic
Roller; A5B Metal Roller Head



Side Rotary Conveyor Lever
A9A Ceramic Roller

Replacement Parts - basic switches

Body type	Basic Switch									
	01	02	03	04	05	06	12	13	20	24
GLC	GLZ301		GLZ303	GLZ304		GLZ306				
GLD	GLZ301		GLZ303	GLZ304		GLZ306				
GLE	GLZ301		GLZ303	GLZ304		GLZ306				GLZ324

Sensing and Control
Honeywell
1985 Douglas Drive North
Golden Valley, MN 55422 USA
+1-815-235-6847
www.honeywell.com/sensing

107147-12-EN IL50 GLO
October 2009
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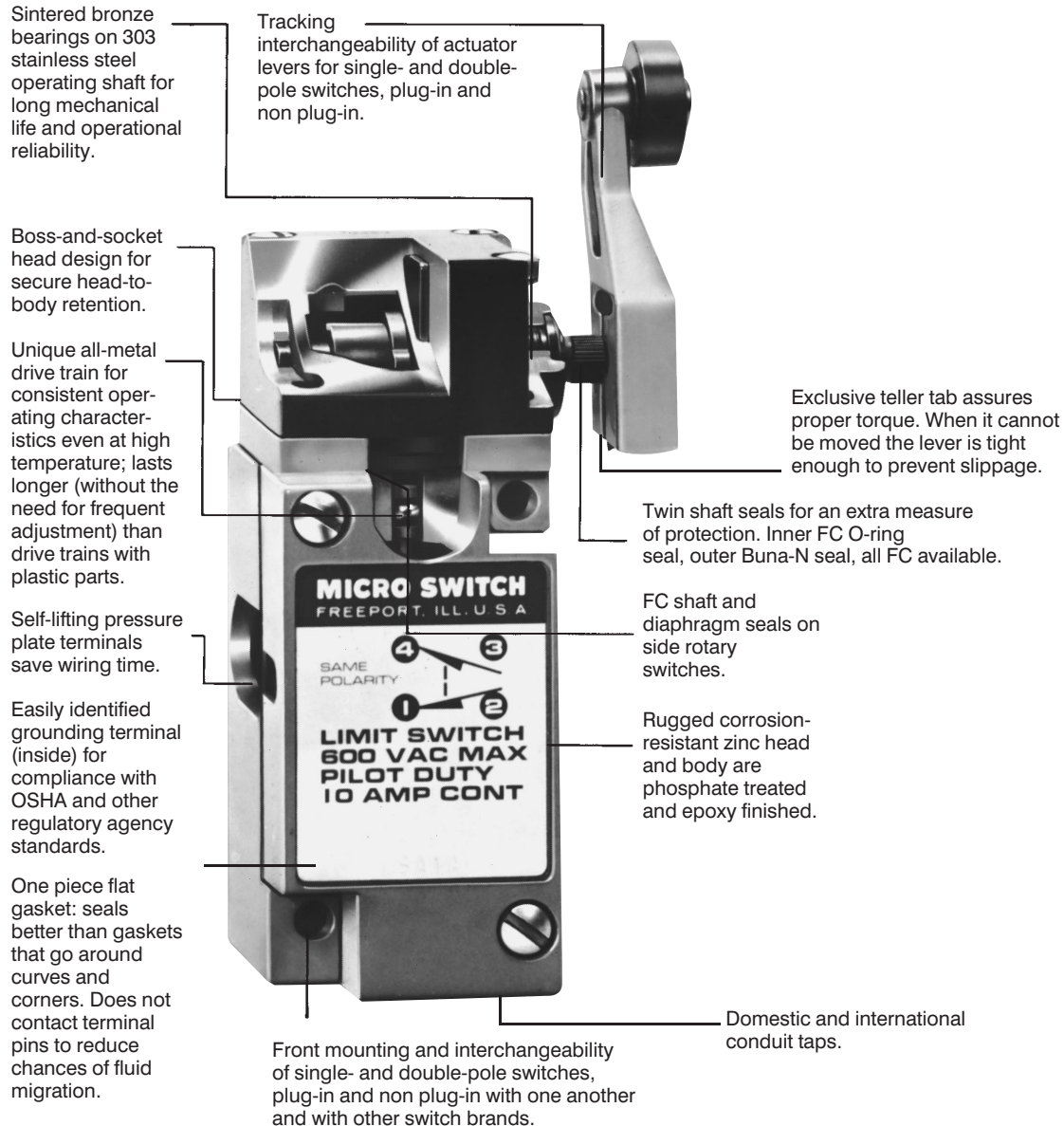
Honeywell

Heavy Duty Limit Switches

ADDITIONAL FEATURES AND OPTIONS

- Wide variety of operating heads
- Field adjustable operating modes, for reduced inventory
- Convenience of on-the-spot adjustment instructions
- Complete choice of circuitry and electrical rating options, including solid state switching
- Plug-in and non plug-in versions have identical operating characteristics and are dimensionally interchangeable
- Manifold (rear-wire) version
- NEMA 1, 3, 4, 4X, 6, 6P, and 13*
- UL Listed, file #E37138
- CSA Certified, file #LR57326
- Explosion-proof version page A113
- Low temperature versions to -40°F (-40°C) page A42
- Captive head and body screws
- Designed to withstand seismic shock
- Stainless steel (NEMA 4X) version page A47
- Prelead cable or prewired connector types page A42
- Epoxy filled wash down (NEMA 6P) types page A44
- Completely fluorocarbon (FC) sealed versions page A42

* Depending on operating head, prewired connector or cable, enclosure ratings may vary. For enclosure rating information on specific catalog listings, contact the 800 number.



Heavy Duty Limit Switches

ROTARY OPERATING HEADS

The head type is designated by the first three letters in the catalog listing, i.e., **LSA1A-1A** has an **LSA** standard side rotary head. See order guides for details. All are momentary action, except the maintained contact LSN head.



Side rotary



Top rotary

SIDE ROTARY

LSA — Standard

Overtravel 60° minimum, pretravel 15° maximum, differential travel 5° (single-pole) and 7° (double-pole) maximum.

LSP — Low Differential Travel

Overtravel 68° minimum, pretravel 9° maximum, differential travel 3° (single-pole) and 4° (double-pole) maximum.

LSR — Low Operating Torque

Overtravel 60° minimum, pretravel 15° maximum, operating torque 1.7 in. lbs. (0,19 Nm) maximum.

LSH — Low Torque, Low Differential Travel

Overtravel 68° minimum, operating torque 1.7 in. lbs. (0,19 Nm) maximum, differential travel 3° (single-pole) and 4° (double-pole) maximum.

LSS — Gravity Return

Operating torque 5 in.-oz.

LST — Extra Low Torque

Operating torque 12 in.-oz.

LSL — Sequence Action

Delayed action between operation of two poles, in each direction. Overtravel 48° minimum.

LSM — Center Neutral

One set of contacts operates on clockwise rotation, another set on counterclockwise rotation. Overtravel 53° minimum.

LSN — Maintained Contact

Operation is maintained on counterclockwise rotation, reset on clockwise rotation, and vice versa. Overtravel 20° minimum.

TOP ROTARY

LSB — High Overtravel

Top rotary actuation is ideal when increased overtravel is required (100° minimum.) Uses same levers as side rotary switches.

ROTARY LEVERS

Shown below are typical lever series for side and top rotary switches. Additional versions are described in the lever order guides.

LSZ51 — Standard Roller Lever (1.5")

LSZ55 — Offset Roller Lever

LSZ53 — Yoke Roller Lever

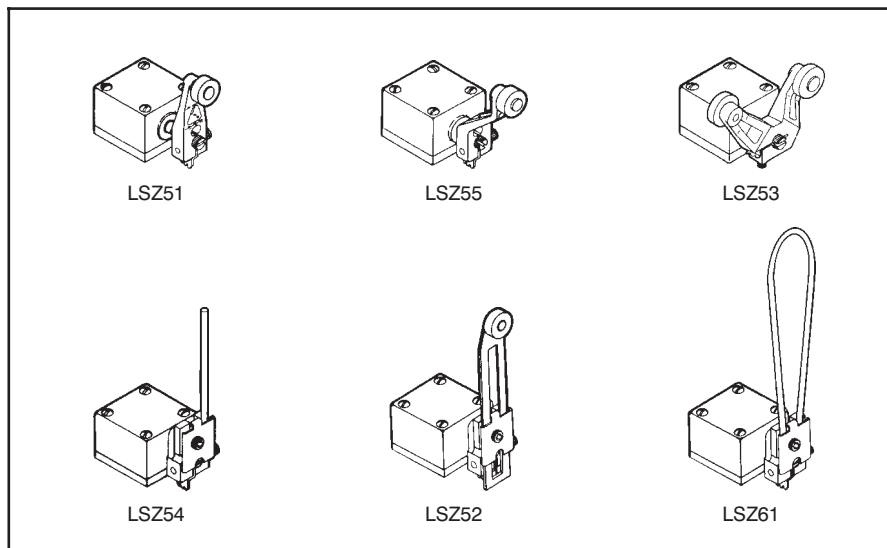
For use with LSN maintained contact switches.

LSZ52 — Adjustable Length Roller Lever

LSZ54 — Rod Lever

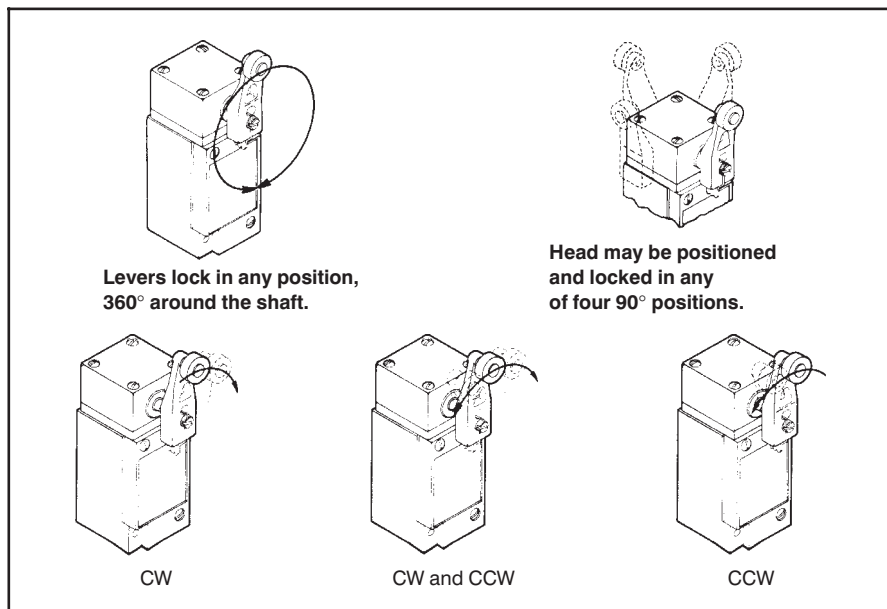
May be cut or formed by user. Available in flexible versions.

LSZ61 — Adjustable Loop Lever



Field adjustable to match application needs

Actuation is adjustable for operation clockwise, counterclockwise, or in both directions. Adjusting instructions are cast into the internal lid of side rotary heads for convenient reference.



Limit/Enclosed

Heavy Duty Limit Switches

PLUNGER OPERATING HEADS

All plungers are momentary action, except the LSG maintained contact version. Over-travel is .190 inch (4.83 mm) minimum. The plungers are sealed with an oiltight boot. A gasket seal is between the head and housing. Plungers are corrosion resistant steel.

TOP PLUNGERS

LSC — Top Plain Plunger

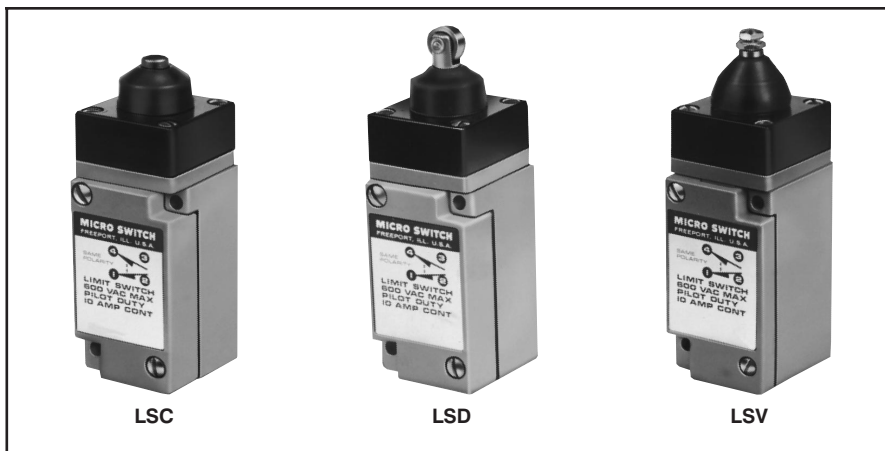
For in-line operating motion.

LSD — Top Roller Plunger

Can be set at 90° increments to accept cam or slide actuation.

LSV — Adjustable Top Plain Plunger

Simplifies installation, since switch operating point can be adjusted from 2.085 to 2.335 inch.



SIDE PLUNGERS

Side plungers fit in close quarters. The heads may be positioned to accept actuation from any of four directions, 90° apart.

LSE — Side Plain Plunger

For in-line actuating motion

LSF — Side Roller Plunger

Roller may be set in vertical or horizontal position for cam or slide actuation.

LSW — Adjustable Side Plain Plunger

Adjustable operating point, 1.615 to 1.865 inch.

LSG — Maintained Contact Side Plain Plunger

Transfer of switch contacts is maintained after either of the two plungers is operated. Operation of other plunger resets switch for next cycle.



WOBBLE LEVER OPERATING HEAD

Switches with wobble lever heads are operated by any movement, except direct pull.

LSJ1A-7M — Spring Wire Lever

May be formed by user to meet special needs.

LSJ1A-7A — Plastic Rod Lever

Use to avoid scratching or marring by actuator.

LSJ1A-7N — Flexible Cable Lever

LSK1A-8C — Stainless Steel Coil Spring Lever

LSK1A-8A — Cat Whisker

For low operating force applications

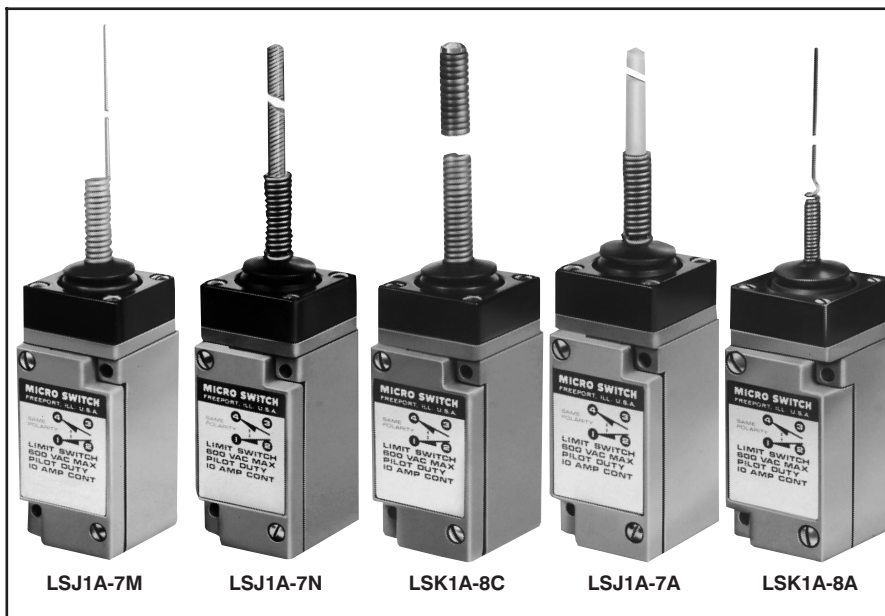
CONDUIT OPENINGS

For conduit openings other than 1/2-NPT and 3/4-NPT, substitute the following for LS in the catalog listing:

PG13,5 — LS3

2mm — LS4

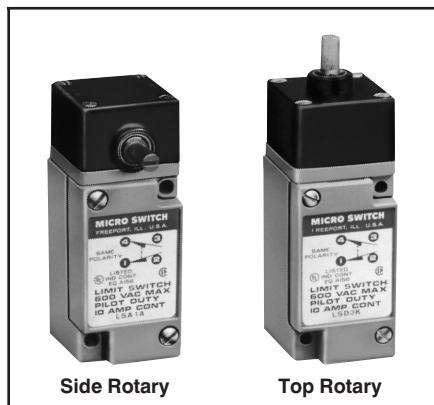
PF1/2 — LS5



Limit and Enclosed Switches

Rotary Actuated Switches

HDLS Series



Side Rotary

Top Rotary

Order guides below and on page A35 provide specification and pricing information for side and top rotary switches.

Plug-in body style catalog listings consist of the complete plug-in base receptacle.

Levers are ordered separately. See pages A37-A39 for lever selection.

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

For low temperature, high temperature or preleading see page A42.

ASSEMBLED CONDITIONS

Catalog listings in order guide below are factory assembled with:

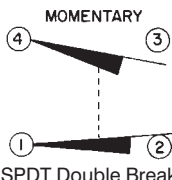
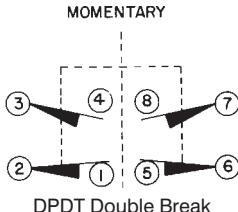

- Shaft of side rotary heads facing front of switch (label side).
- Head adjusted for both clockwise and counterclockwise operation.
- Light on indicator versions wired to N.O. circuit.

Refer to facing page to specify modifications to these assembled conditions.

PRELEADED OR CONNECTORIZED VERSIONS

Refer to page A42.

ORDER GUIDE (Momentary action. UL listed, CSA certified, CE approved. Levers not included. Order separately pages A37-A39.)

Circuitry	Electrical Rating	Body** Style	Catalog Listings					
			Standard	Low Differential	5° Pretravel	Low Torque	Low Differential Low Torque	Top Rotary High Overtravel
Silver contacts	A	Plug-in 1/2" Conduit	LSA1A	LSP1A	LSU1A	LSR1A	LSH1A	LSB1A
Gold cross point contacts	C	Plug-in 1/2" Conduit	LSA1J		LSU1J	—	—	LSB1J
Gold plated contacts	C		LSA1E	LSP1E	—	LSR1E	LSH1E	—
Silver contacts	A*	120 V Ind. lite Plug-In* 1/2" Conduit	LSA5A	LSP5A	LSU5A	LSR5A	LSH5A	LSB5A
	A*	240 V Ind. lite Plug-In 1/2" Conduit	LSA8A	LSP8A	LSU8A	LSR8A	LSH8A	LSB8A
	A*	24 V LED lite 1.5mA max. Auto polarity Plug-in 1/2" Conduit	LSA9A	LSP9A	LSU9A	LSR9A	LSH9A	LSB9A
 SPDT Double Break	A	Non plug-in 1/2" Conduit	LSA3K	LSP3K	LSU3K	LSR3K	LSH3K	LSB3K
Silver contacts	B	Plug-in 3/4" Conduit	LSA2B	LSP2B	LSU2B	LSR2B	LSH2B	LSB2B
 DPDT Double Break	B	Plug-in 1/2" Conduit	LSA6B	LSP6B	LSU6B	LSR6B	LSH6B	LSB6B
	B	120 V Ind. lite Plug-in 3/4" Conduit	LSA2R	LSP2R	LSU2R	LSR2R	LSH2R	LSB2R
	B	Non plug-in 3/4" Conduit	LSA4L	LSP4L	LSU4L	LSR4L	LSH4L	LSB4L
	B	Non plug-in 1/2" Conduit	LSA7L	LSP7L	LSU7L	LSR7L	LSH7L	LSB7L
 SPNC Direct Acting	D	Non plug-in 1/2" Conduit	LSA3N			LSR3N		LSB3N

*Use at voltage indicated for light. Wired to N.O. circuit.

Upper temperature limit for lighted units is 200°F (93°C).

**Plug-in listings include base receptacle.

OPERATING CHARACTERISTICS

Pretravel (degrees max.)		15	9	5	15	9	25
Differential Travel (degrees max.)	SPDT	5	3	3	5	3	10
	DPDT	7	4	4	7	4	12
Overtravel (degrees min.)		60	66	70	60	66	110
Operating Torque (max.)	NM = Newton meters	0,45 Nm 4 in. lbs.	0,45 Nm 4 in. lbs.	0,45 Nm 4 in. lbs.	0,19 Nm 1.7 in. lbs.	0,19 Nm 1.7 in. lbs.	0,28 Nm 2.5 in. lbs.
Operating Temperature Range***		10°F to 250°F -12° to 121°C			30°F to 250°F -1° to 121°C		

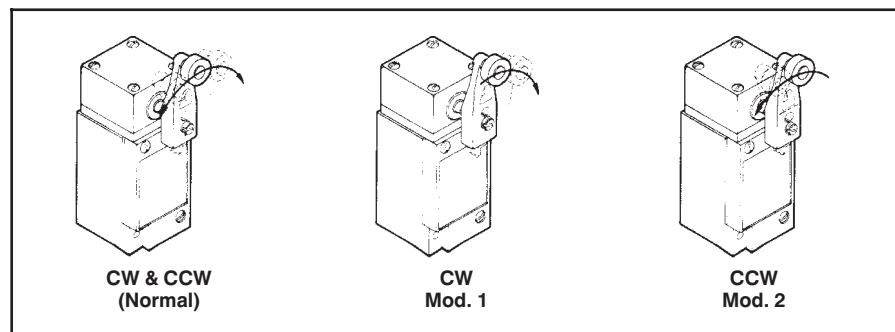
***Completely fluorocarbon-sealed switches are preferred for use in temperatures above 200°F (93°C). Refer to page A42.

Limit/Enclosed

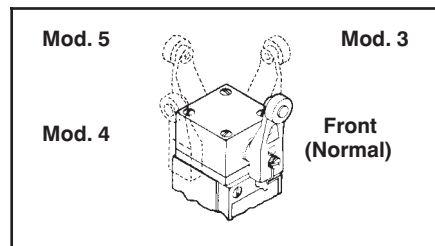
Rotary Actuated Switches

ACTUATION DIRECTION

(Drawings apply to listings on facing page only).



HEAD ORIENTATION



ASSEMBLY MODIFICATIONS

How to order

Momentary action rotary switches can be furnished in other than the normal assembled conditions described on the facing page. To specify modifications, add the number(s) shown below to the catalog listings. Prices are the same as their counterparts shown in the order guide.

Modification number suffixes are:

- 1 Clockwise operation only
- 2 Counterclockwise operation only
- 3 Shaft to right of switch front
- 4 Shaft to left of switch front
- 5 Shaft to back of switch
- 7 Indicator light wired to N.C. circuit

Examples:

Catalog Listing LSA1A23 is an LSA1A switch adjusted for counterclockwise operation only. The operating shaft is to the right side of the switch when viewing it from the front (label side). No lever.

Catalog Listing LSA8A7 is an LSA8A switch with the 240 volt indicator light wired to the N.C. circuit. No lever.

Switches with assembly modifications are not normally stocked and may extend delivery leadtimes.

LEVERS

Levers for rotary actuated switches are normally ordered as separate catalog listings. They also may be ordered by including a suffix to the switch catalog listing and adding the lever price. See pages A34-A39.

SWITCHES FOR SPECIAL APPLICATIONS

HDLS limit switches for special application needs are described on pages A42 and A43. They include: manifold mount, low temperature, complete fluorocarbon-sealed, gravity return, extra low torque and 20 Amp switches.

Adapter plates for interchanging HDLS with LS/200LS limit switches are described on page A49.

ELECTRICAL RATINGS

10 amps continuous carry (except for electrical rating "C"). Circuits on any one pole must be the same polarity.

AC Volts

Pilot duty: 600 VAC, 720VA

Electrical Rating	Circuitry	VAC	Amps at 0.35 Power Factor	
			Make	Break
A*	Single-Pole Double-Throw	120	60	6
		240	30	3
		480	15	1.5
		600	12	1.2
B	Double-Pole Double-Throw	120	30	3
		240	15	1.5
		480	7.5	0.75
		600	6	0.60
D	Single-Pole Single-Throw Normally Closed	120	60	6
		240	30	3
		480	15	1.5
		600	12	1.2
C**	Single-Pole Double-Throw	250 VAC or 60 VDC, .050 amp max.		

DC Volts

Pilot duty: 240 VDC, 30 watts

Electrical Rating	Circuitry	VDC	Make and Break Amps	
			Inductive	Resistive
A*	Single-Pole Double-Throw	120	0.25	0.8
		240	0.15	0.4
B	Double-Pole Double-Throw	120	0.25	0.8
		240	0.15	0.4
D	Single-Pole Single-Throw Normally Closed	30	4.3	4.3
		120	1.1	1.1
C**	Single-Pole Double-Throw	250 VAC or 60 VDC, .050 amp max.		

*For switches with indicator light, use only at voltage stated for indicator light.

**These switches have either gold plated or gold cross point contacts. Cross point contacts improve high reliability of contact make when particle contamination is a problem or low energy loads must be carried.

Rotary Actuated Switches

ADDITIONAL CIRCUITRY/ACTION OPTIONS



ASSEMBLY MODIFICATIONS

Switches in the order guide, below, have the operating shaft facing front. If another orientation is desired, add a number from the drawing to the catalog listing.

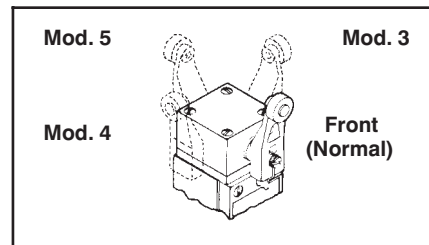
To specify the indicator light wired to the N.C. circuit, add **7** to the catalog listing.

Example:

Catalog Listing **LSN5A37** is an LSN5A switch with the shaft facing right and the indicator light wired to the N.C. circuit.

HEAD ORIENTATION

(Drawing applies to this page only.)



Lever ordering information is shown on pages A36-A39.

ORDER GUIDE

Maintained, center neutral, or sequential action. UL listed, CSA certified. Levers not included (see pages A36-A39).

For low temperature, all Viton or preloaded versions see page A42.

Circuitry	Elec. Rating Page A23	Body** Style	Maintained† 360° Alternate Action	2 Position Standard	Center Neutral (Pole 1 operates CCW Pole 2 operates CW)	Sequential (Pole 1 operates before Pole 2, either CW or CCW or both)
 SPDT Double Break Maintained	A	Plug-in 1/2" Conduit	LSQ300	LSN1A	 CENTER NEUTRAL (Momentary)	 SEQUENCE (Momentary)
	A*	120V Ind. Lite Plug-in 1/2" Conduit		LSN5A		
	A*	240V Ind. Lite Plug-in 1/2" Conduit		LSN8A		
	A	Non plug-in 1/2" Conduit	LSQ310	LSN3K		
 DPDT Double Break Maintained	B	Plug-in 3/4" Conduit		LSN2B	LSM2D	LSL2C
	B	Plug-in 1/2" Conduit		LSN6B	LSM6D	LSL6C
	B	Non plug-in 3/4" Conduit	LSQ320	LSN4L	LSM4N	LSL4M
	B	Non plug-in 1/2" Conduit		LSN7L	LSM7N	LSL7M
 SP Normally Closed Direct Acting	D	Non plug-in 1/2" Conduit		LSN3N		

* Use at voltage indicated for light. Wired to N.O. circuit.
Upper temperature for lighted units is 200°F (93°C).

** Plug-in listings include base receptacle.

† Total travel is approximately 80° max. Maintained contact switch normally used with LSZ53 yoke actuator.

OPERATING CHARACTERISTICS

Pretravel (degrees max.)	SPDT	65	Not Applicable	Not Applicable
Note: Mechanical trip before electrical trip	DPDT	65	18	1st Pole 15 2nd Pole 10 additional (max.)
Differential Travel (degrees max.)	SPDT	40	Not Applicable	Not Applicable
	DPDT	40	10	For each pole — 5 degrees
Overtravel (degrees min.)		20	57	48
Operating Torque (max.)	Nm = Newton meters	0,45 Nm 4 in. lbs.	0,45 4 in. lbs.	0,45 4 in. lbs.
Operating Temperature Range***		30°F to 250°F -1 to 121°C		10°F to 250°F -12 to 121°C

*** Completely fluorocarbon-sealed switches are preferred for temperatures above 200°F (93°C). Refer to page A42.

Limit/Enclosed

Levers for Rotary Actuated Switches

Levers for use with side or top rotary actuated switches are available in a wide choice of sizes and materials, as shown in the order guides on the following pages. Rollers may be on either side of the lever to best match the external actuating mechanism. They permit a wide range of cam tracking possibilities (see drawings below).

LSZ51 standard rollers and **LSZ55** offset roller levers have a fixed 1.5 inch (38,1 mm) radius.

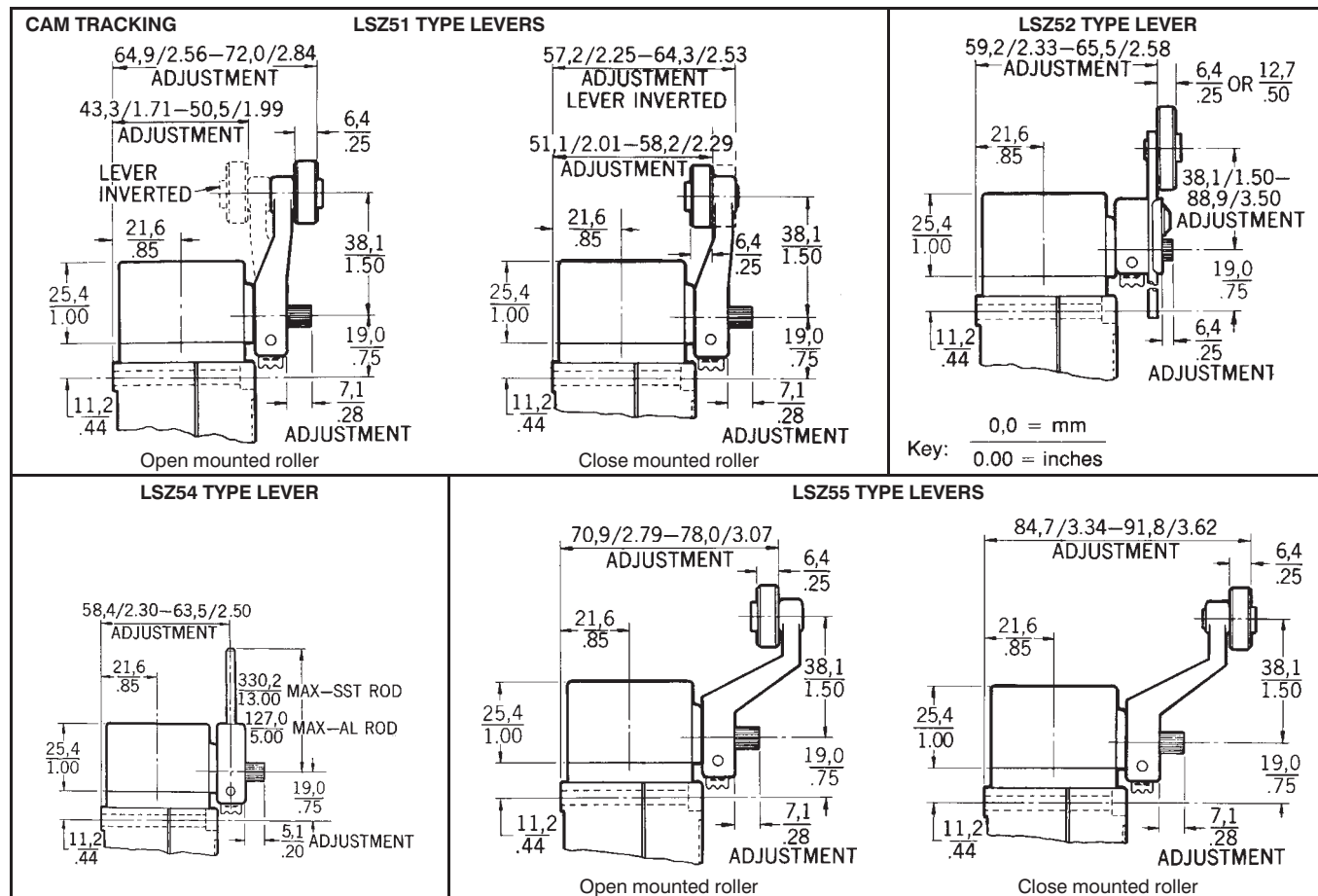
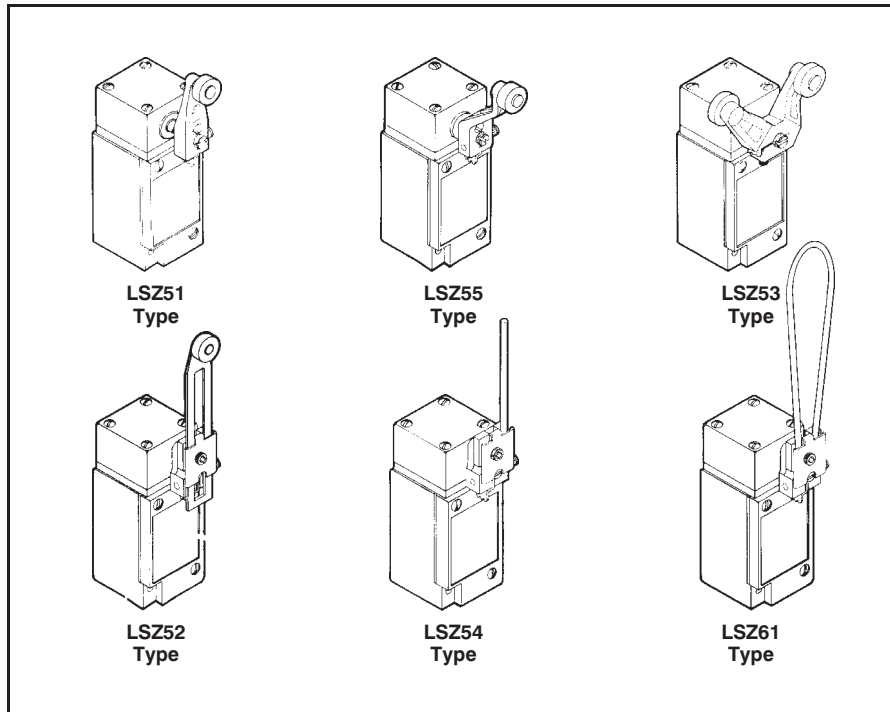
LSZ53 yoke roller levers are used with side rotary maintained switches, where a reciprocating actuator operates the switch in one direction and reverses it when moving in the other direction.

LSZ52 adjustable length roller levers are universally adaptable to many application needs.

LSZ54 rod levers may be formed by the user. The hub permits adjusting of lever length. Also available in flexible versions.

LSZ61 is an adjustable loop lever.

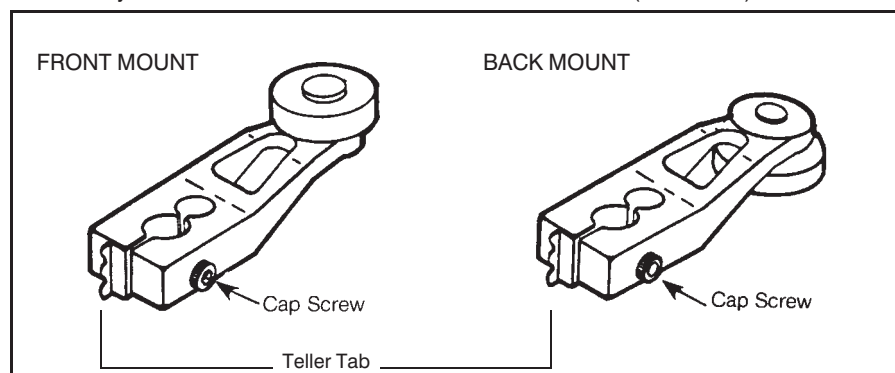
For lever order guides, refer to the following pages.



NOTE: Shaft dia. is .29 in.

Levers for Rotary Actuated Switches

Rollers may be mounted on the front or back side of the lever. (See below).



Levers shown in the order guides are furnished with cap screws which accommodate a 5/64-inch allen wrench.

Teller tab assures proper torque. When it cannot be moved, the lever is tight enough to prevent slippage.

TO ORDER LEVERS SEPARATELY

Catalog listings in the shaded column of the order guides are used when ordering levers as separate items, i.e., LSZ51A, LSZ53B, etc.

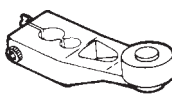
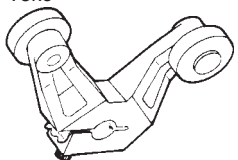

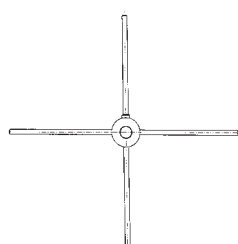
TO ORDER LEVERS WITH SWITCHES

Refer to the lefthand shaded column with dash-number suffixes to order lever and switches together. Add the appropriate suffix to the switch catalog listing.

Example:

Catalog Listing LSA1A-1B is an LSA1A switch with a standard lever which has the steel roller mounted on the front side.

ORDER GUIDE

Type	Radius (in.)	Roller Mounted On This Side Of Lever	Dia. in.	Width in.	Material	To Order Lever With Switch, Add Suffix To Switch Catalog Listing	Use These Catalog Listings To Order Levers Separately
 LSZ51 Series Std. Roller Lever	1.5	Front	.75	.25	Nylon	-1A	LSZ51A
	1.5	Front	.75	.25	Steel	-1B	LSZ51B
	1.5	Back	.75	.25	Nylon	-1C	LSZ51C
	1.5	Back	.75	.25	Steel	-1D	LSZ51D
	1.5	Front	1.0	.50	Nylon	-1F	LSZ51F
	1.5	Front	1.5	.25	Nylon	-1G	LSZ51G
	1.5	Back	1.0	.50	Nylon	-1J	LSZ51J
	1.5	Back	.75	.25	Ball Bearing	-1L	LSZ51L
	1.5	Back	.75	1.30	Nylon	-1M	LSZ51M
	1.5	Back	.75	.375	Stainless	-1T	LSZ51T
	1.5	Front	.75	.50	Nylon	-1P	LSZ51P
	1.5	Front	1.59	.25	Nylon	-1R	LSZ51R
	1.5	—	—	—	Less Roller	—	LSZ51
 LSZ53 Series Yoke Back view of LSZ53E	1.5	Front-Back	.75	.25	Nylon	-3A	LSZ53A
	1.5	Front-Back	.75	.25	Steel	-3B	LSZ53B
	1.5	Front-Front	.75	.25	Steel	-3D	LSZ53D
	1.5	Back-Front	.75	.25	Nylon	-3E	LSZ53E
	1.5	Back-Back	.75	.25	Nylon	-3S	LSZ53S
	1.5	Back-Back	.75	.25	Steel	-3P	LSZ53P
	1.5	Back-Front	.75	.25	Steel	-3U	LSZ53U
	1.5	Back-Front	.75	1.25	Nylon	-3M	LSZ53M
	1.5	—	—	—	Less Rollers	—	LSZ53
 LSZ55 Series Offset	1.5	—	—	—	Less Roller	—	LSZ55
	1.5	Back	.75	.25	Nylon	-5A	LSZ55A
	1.5	Back	.75	.25	Steel	-5B	LSZ55B
	1.5	Front	.75	.25	Nylon	-5C	LSZ55C
	1.5	Front	.75	.25	Steel	-5D	LSZ55D
	1.5	Front	.75	.50	Nylon	-5E	LSZ55E
	1.5	Front	1.5	.25	Nylon	-5K	LSZ55K
	1.5	Front	1.0	.50	Nylon	-5F	LSZ55F
 LSZ69 Series* Spoke	—	—	6.0	—	Stainless (fixed)	—	LSZ69AA
	—	—	6.0	—	Stainless (spokes replaceable)	—	LSZ69BA

*For use with LSQ300 Series. Hub is aluminum. See page A59 for dimensions.

Limit/Enclosed

Levers for Rotary Actuated Switches

METRIC CONVERSION

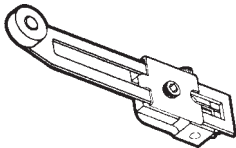
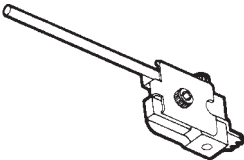
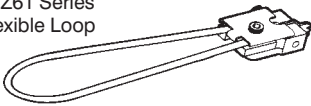
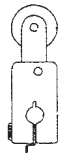
.25 in.	=	6,35 mm
.5 in.	=	12,7 mm
.625 in.	=	15,9 mm
.75 in.	=	19,1 mm
1.0 in.	=	25,4 mm
1.5 in.	=	38,1 mm
2.0 in.	=	50,8 mm
2.5 in.	=	63,5 mm
3.0 in.	=	76,2 mm
4.8 in.	=	122 mm
5.0 in.	=	127 mm
6.0 in.	=	152 mm
12.0 in.	=	305 mm

LOW TORQUE APPLICATION CONSIDERATION

When heavier levers (such as LSZ52 series and LSZ54 series, below), are used with low torque LSH, LSR, LSS and LST switches, it is desirable to mount the switch with the lever down. In this way, gravity will assist in restoring levers to the free position.

Conversely, when these switches are mounted with the lever upright, gravity tends to work to prevent lever return after switching actuation. By counterbalancing the lever or adding an auxiliary extension spring, this problem may be overcome. Contact the 800 number for application assistance.

ORDER GUIDE

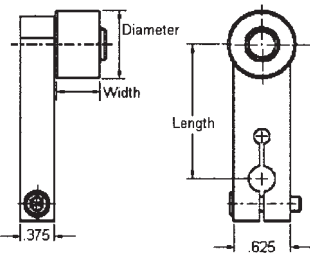
Type	Radius (in.)	Roller Mounted On This Side Of Lever	Dia. in.	Width in.	Material	To Order Lever With Switch, Add Suffix To Switch Catalog Listing	Use These Catalog Listings To Order Levers Separately	
	LSZ52 Series	1.5-3.5	Back	.75	.25	Nylon	-2A	LSZ52A
	Adjustable	1.5-3.5	Back	.75	.25	Steel	-2B	LSZ52B
	Radius	1.5-3.5	Front	.75	.25	Nylon	-2C	LSZ52C
		1.5-3.5	Front	.75	.25	Steel	-2D	LSZ52D
		1.5-3.5	Front	.75	1.30	Nylon	-2E	LSZ52E
		1.5-3.5	Front	1.0	.5	Nylon	-2J	LSZ52J
		1.5-3.5	Front	1.5	.25	Nylon	-2K	LSZ52K
		1.5-3.5	Front	.75	.25	Ball Bearing	-2L	LSZ52L
		1.5-3.5	Front	2.0	.25	Nylon	-2M	LSZ52M
		1.5-3.5	Front	.75	.5	Nylon	-2N	LSZ52N
					Less Roller Hub Only	—	LSZ52	
						—	LSZ54	
LSZ68 Series	12.0	—	.25	—	Delrin Rod w/Spring	—	LSZ68	
Spring/Rod	16.0	—	.25	—	Delrin Rod w/Spring	—	LSZ617	
	LSZ54 Series	5.5	—	—	Aluminum	-4M	LSZ54M	
	Rod	13.0	—	—	Stainless Steel	-4N	LSZ54N	
		20.0	—	—	Delrin Rod	-4P	LSZ54P	
		12.0	—	—	Spring Wire	-4R	LSZ54R	
		4.8	—	—	Flexible Cable	-4V	LSZ54V*	
					Hub Only	—	LSZ54	
	LSZ61 Series	6" Flexible Loop/Cap Screw				Nylatron	—	LSZ61
	Flexible Loop	9.5" Flexible Loop/Cap Screw				Hub Only	—	LSZ618
		(measured from center line of shaft hole to tip of actuator)					—	LSZ54
	LSZ60 Series	Front	.75	.25	Nylon	—	LSZ60A	
	One Way Roller Lever	Front	.75	.25	Steel	—	LSZ60B	

See page A60 for dimensions.

* Hub not available separately.

Levers for Rotary Actuated Switches

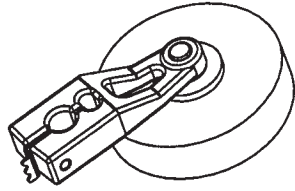
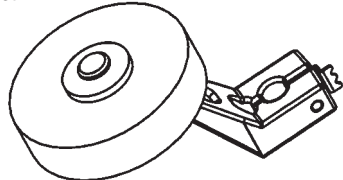
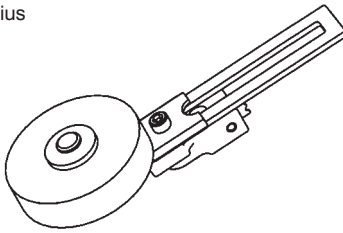
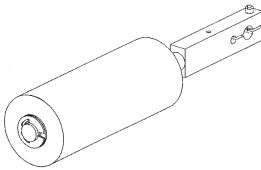
FIXED LENGTH LEVERS ORDER GUIDE

Fixed Length Levers LSZ65 Series	Lever Length (in.)	Lever Listing	For a complete listing add your choice of roller suffix			
			Roller Suffix	Dia. in.	Width in.	Material
	.88	LSZ65A	A	.75	.25	Nylon
	1.38	LSZ65B	B	.75	.25	Steel
	1.25	LSZ65L				
	1.50	LSZ65C	C	.75	.50	Nylon
	1.75	LSZ65D	D	.75	1.30	Nylon
	2.00	LSZ65E	E	1.00	.50	Nylon
	2.50	LSZ65F	F	1.50	.25	Nylon
	3.00	LSZ65G				
	4.00	LSZ65H				
	5.00	LSZ65J				
	6.00	LSZ65K				
	Example: LSZ65AB is a .88" long lever with a steel .75" diameter, .25" wide roller.					

RUBBER ROLLER LEVERS

Ideal for elevator or conveyor applications requiring quiet operation or protection of delicate surfaces.

ORDER GUIDE

Type	Radius (in.)	Roller Mounted On This Side Of Lever	Dia. in.	Width in.	Material	Catalog Listing
LSZ51 Series Std. Roller Lever 	1.5 1.5	Front Front	1.6 2.0	.5 .5	Rubber Rubber	LSZ51W LSZ51Y
LSZ55 Series Offset 	1.5 1.5	Front Front	1.6 2.0	.50 .50	Rubber Rubber	LSZ55W LSZ55Y
LSZ52 Series Adjustable Radius 	1.5 to 3.5 1.5 to 3.5	Front Front	1.6 2.0	.50 .50	Rubber Rubber	LSZ52W LSZ52Y
LSZ67 Series Conveyor Roller 	—	—	1.5	3.8	Plastic	LSZ67AA

Limit/Enclosed

Plunger Actuated Switches

ASSEMBLED CONDITIONS

Catalog listings in order guide below are factory assembled with:

- Side plungers facing front (label side) of switch. Rollers on side plungers are in horizontal position.

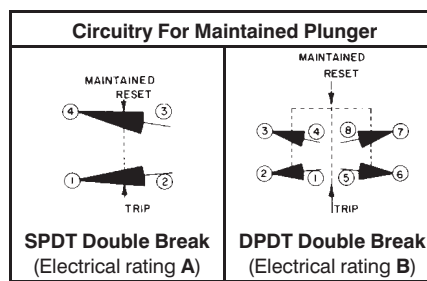
- Roller on top plungers are parallel to mounting surface.
- Lights on indicator versions are wired to N.O. circuit.

Refer to facing page to specify modifications to these assembled conditions.

For low temperature, high temperature or preleaded versions see page A42.

ORDER GUIDE

Momentary action, except for maintained contact LSG version. UL listed, CSA certified.



Circuits on any one pole must be the same polarity.

Catalog listings in this chart are complete switches.			Catalog Listings						
			Top Plungers			Side Plungers			Maintained (Circuitry Shown Above)
Circuitry	Elec. Rating Page A34	Body** Style	Plain	Roller	Adjustable	Plain	Roller	Adjustable	
Silver contacts	A	Plug-in 1/2" Conduit	LSC1A	LSD1A	LSV1A	LSE1A	LSF1A	LSW1A	LSG1A
Gold cross pt.	C	Plug-in 1/2" Conduit	LSC1J	LSD1J	LSV1J	LSE1J	LSF1J	LSW1J	—
Gold plated	C	—	—	LSD1E	—	—	LSF1E	LSW1E	—
 SPDT Double Break	A*	120 V. Ind. Lite Plug-in 1/2" Conduit*	LSC5A	LSD5A	LSV5A	LSE5A	LSF5A	LSW5A	LSG5A
	A*	240 V. Ind. Lite Plug-in 1/2" Conduit*	LSC8A	LSD8A	LSV8A	LSE8A	LSF8A	LSW8A	LSG8A
	A	Non plug-in 1/2" Conduit	LSC3K	LSD3K	LSV3K	LSE3K	LSF3K	LSW3K	LSG3K
 DPDT Double Break	B	Plug-in 3/4" Conduit	LSC2B	LSD2B	LSV2B	LSE2B	LSF2B	LSW2B	LSG2B
	B	120 V Ind. Lite Plug-in 3/4" Conduit	LSC2R	LSD2R	LSV2R	LSE2R	LSF2R	LSW2R	LSG2R
	B	Plug-in 1/2" Conduit	LSC6B	LSD6B	LSV6B	LSE6B	LSF6B	LSW6B	LSG6B
	B	Non plug-in 3/4" Conduit	LSC4L	LSD4L	LSV4L	LSE4L	LSF4L	LSW4L	LSG4L
	B	Non plug-in 1/2" Conduit	LSC7L	LSD7L	LSV7L	LSE7L	LSF7L	LSW7L	LSG7L
 SPNC Direct Acting	D	Non plug-in 1/2" Conduit	—	—	—	LSE3N	LSF3N	LSW3N	LSG3N

*Use at voltage indicated for light. Upper operating temperature limit for lighted units is 200°F. Wired to N.O. circuit.

** Plug-in listings include base receptacle.

OPERATING CHARACTERISTICS

mm Pretravel (in. max.)	1,78 .070	1,78 .070	1,78 .070	2,54 .100	2,54 .100	2,54 .100	4,32 .170
Differential mm Travel (in. max.)	0,38 .015	0,38 .015	0,38 .015	0,64 .025	0,64 .025	0,64 .025	2,29 .090
	0,51 .020	0,51 .020	0,51 .020	0,89 .035	0,89 .035	0,89 .035	2,29 .090
mm Overtravel (in. min.)	4,83 .190	4,83 .190	4,83 .190	4,83 .190	4,83 .190	4,83 .190	2,0 .080
Newton Operating Force (lb. max.)	17,8 4	17,8 4	17,8 4	26,7 6	26,7 6	26,7 6	44,5 10
Operating Point mm (in.)	45,8 ±0,76 1.805 ±.030	55,9 ±1,02 2.200 ±.040	53,0 to 59,3 2.085 to 2.335	33,0 ±0,76 1.300 ±.030	44,1 ±1,02 1.735 ±.040	41,0 to 47,4 1.615 to 1.865	37,6 ±0,76 1.480 ±.030
Operating Temperature Range	10°F to 200°F -12 to 93°C		10°F to 200°F -12 to 93°C		10°F to 200°F -12 to 93°C		30°F to 200°F -1 to 93°C

Plunger Actuated Switches/Assembly Modifications

ASSEMBLY MODIFICATIONS

How to order

To specify other than the normal assembled conditions described on facing page, add the following modification numbers to the catalog listing in the plunger switch order guide.

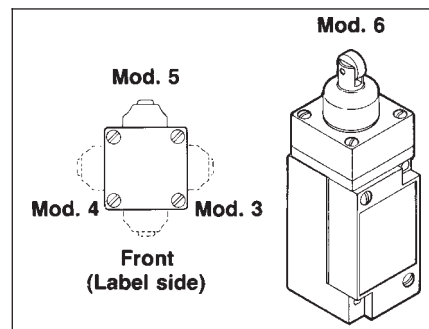
Mod.

- 3 Side plunger to right of switch front
- 4 Side plunger to left of switch front

- 5 Side plunger to back of switch
- 6 Roller on top plungers perpendicular to mounting surface
- 7 Light on indicator versions wired to N.C. circuit
- 8 Roller on side plungers in vertical position.

Example:

LSF1A3 is an LSF1A with the side roller plunger to the right side.






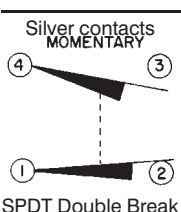
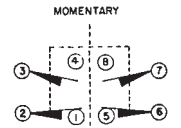


Wobble Actuated Switches

Wobble actuated switches have flexible levers which may be operated with any movement, except direct pull.

ORDER GUIDE

Momentary action. UL listed, CSA certified

			Catalog Listings				
Catalog listings in this chart are complete switches.							
Lever lengths measured from top mounting hole			5.5"	13"	5.5"	5.5"	5.5"
Circuitry	Elec. Rating Page A34	Body** Style	Delrin Rod	Spring Wire	Cat*** Whisker	Cable	Coil Spring
Silver contacts	A	Plug-in 1/2" Conduit	LSJ1A-7A	LSJ1A-7M	LSK1A-8A	LSJ1A-7N	LSK1A-8C
Gold cross point	C	Plug-in 1/2" Conduit	LSJ1J-7A	LSJ1J-7M	LSK1J-8A	LSJ1J-7N	LSK1J-8C
Gold plated contacts	C		—	LSJ1E-7M	—	—	—
 SPDT Double Break	A*	120 V. Ind. Lite Plug-in 1/2" Conduit*	LSJ5A-7A	LSJ5A-7M	LSK5A-8A	LSJ5A-7N	LSK5A-8C
	A*	240 V. Ind. Lite Plug-in 1/2" Conduit*	LSJ8A-7A	LSJ8A-7M	LSK8A-8A	LSJ8A-7N	LSK8A-8C
	A	Non plug-in 1/2" Conduit	LSJ3K-7A	LSJ3K-7M	LSK3K-8A	LSJ3K-7N	LSK3K-8C
 DPDT Double Break	B	Plug-in 3/4" Conduit	LSJ2B-7A	LSJ2B-7M	LSK2B-8A	LSJ2B-7N	LSK2B-8C
	B	120 V Ind. Lite Plug-In 3/4" Conduit	LSJ2R-7A	LSJ2R-7M	LSK2R-8A	LSJ2R-7N	LSK2R-8C
	B	Plug-in 1/2" Conduit	LSJ6B-7A	LSJ6B-7M	LSK6B-8A	LSJ6B-7N	LSK6B-8C
	B	Non plug-in 3/4" Conduit	LSJ4L-7A	LSJ4L-7M	LSK4L-8A	LSJ4L-7N	LSK4L-8C
	B	Non plug-in 1/2" Conduit	LSJ7L-7A	LSJ7L-7M	LSK7L-8A	LSJ7L-7N	LSK7L-8C

OPERATING CHARACTERISTICS

mm Pretravel (approx. in. radius)	25,4 1	102 4	51 2	38 1.5	51 2
Newton Operating Force (oz. max.)	2,78 10	1,39 5	1,39 5	1,95 7	1,95 7
Operating Temperature Range	10°F to 200°F 12 to 93°C				

* Use at voltage indicated for light. Upper operating temperature limit for lighted units is 200°F.

** Plug-in listings include base receptacle.

*** These cat whiskers have 5 1/2 inch long levers. To specify 7 1/2 inch length, substitute -8B for -8A.

Limit/Enclosed

Limit and Enclosed Switches

Switches for Special Applications

HDLS Series



NOTE: LSS1H and LST1H switches are usually mounted with the lever down. Heavier levers, such as the LSZ54N (shown) and LSZ52D, should be used to enable gravity to help restore them to the free position. These levers are described on page A38.

SPECIFYING GUIDE FOR:

HIGH TEMPERATURE-CHEMICAL RESISTANT SWITCHES

Completely fluorocarbon (FC)-sealed HDLS limit switches have a full FC body gasket covering the switch cavity. Rotary types have an extra FC seal on the operating shaft, while plunger versions have FC boot seals.

They are for use in applications where the environment includes fire-resistant synthetic fluids. In addition to most all fluids, the FC sealed switches may be used with such industrial fluids as Cellulube, Fyrquell, Houghto-Safe, Pydraul, and other special cutting and hydraulic oils. **For seal performance chart see page A56.** The additional FC seals also promote longer operating life for rotary actuated HDLS switches in applications where the temperatures are normally 10° to 250°F (–12 to 121°C). If prewired with cable, then temperature limits are 221°F (105°C) dry and 140°F (60°C) wet.

How to order

Insert the additional letters **Y** and **C** in the appropriate places in the standard catalog listing as shown in the example below.

Example:

LSA1A — standard side rotary plug-in switch

LSYAC1A — Completely FC-sealed version of LSA1A

GRAVITY RETURN SIDE ROTARY SWITCHES

LSS1H gravity return side rotary limit switches have no return spring mechanism. The weight of the actuating lever must provide the force to restore it to the free position.

The extremely light 5 in. oz. max. operating torque is useful in conveyor applications, since it enables operation by small

or lightweight objects. Because the head is unsealed, the LSS1H is classed as NEMA 1. However, the switch cavity is sealed to protect the contacts.

The LSS1H has the plug-in body style, with a ½ in. conduit opening.

Circuitry is SPDT double break. Refer to electrical rating **B**, page A34.

ORDER GUIDE (Momentary action)

Operating Torque Max.	Differential Travel Max.	Total Travel No Stop	Catalog Listing
0,035 Nm 5 in. oz.	12°	360°	LSS1H

Nm = Newton meters

EXTRA LOW TORQUE SIDE ROTARY SWITCHES

LST1H extra low torque side rotary limit switches have a low force return spring and a maximum operating torque of 12 in. oz. It is NEMA 1, because of an unsealed head. But, as with the LSS1H, the switch cavity is sealed.

The LST1H has a plug-in body style, with a ½ in. conduit opening.

Circuitry is SPDT double break. Refer to electrical rating **B**, page A34.

ORDER GUIDE (Momentary action)

Operating Torque max.	Pre-Travel max.	Over-Travel min.	Differential Travel max.	Total Travel ref.	Catalog Listing
0,085 Nm 12 in. oz.	15°	60°	5°	85° nom.	LST1H

Nm = Newton meters

LOW TEMPERATURE SWITCHES

All forms of HDLS limit switches are also available in low temperature construction.

Design changes include fluorosilicone diaphragm, shaft seals, and external boot seal (where applicable) plus a low temperature lubricant. If prewired with cable, temperature limits are 14°F (–10°C) flex and 22°F (–30°C) no flex. **The temperature ranges for specific switches see page A56.**

How to order

A low temperature version of any HDLS limit switch shown in the order guide can be specified by inserting the additional letters **Y** and **B** into the appropriate place in the standard switch listing as shown in the example below.

Example:

LSA1A — standard side rotary plug-in switch

LSYAB1A — low temperature version of LSA1A

FACTORY SEALED PRE-WIRED LIMIT SWITCHES

FEATURES

- Prewired with 6 ft STOOW-A cable or 4, 5 or 9-pin connectors (other lengths available)
- Wire entry area completely factory sealed
- (Cable version) NEMA 1, 6, 6P, 12
- (Connector version) NEMA 1, 6, 6P, 12 13

How to order

To order factory sealed switches, add the modification codes shown below to standard HDLS listings:

Circuitry	Cable	½" Connector
SPDT	C	A (4 pin mini) B (5 pin mini) DD (4 pin micro)
DPDT	M	R (9 pin)

Example: LSA1AC — LSA1A with 6 ft of 5 conductor STOOW-A cable.
LSJ2BM-7N — LSJ2B-7N with 6 ft of 9 conductor STOOW-A cable.
LSA1AB — LSA1A with 5 pin receptacle.
LSA1ADD — 4 pin micro-change connector.

NOTE: Connector versions available with ½ in. conduit tap only.

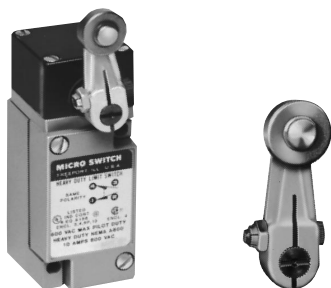
Refer to page A46 for pin-out and mating connector. Refer to page A58 for dimensions.

Limit and Enclosed Switches

HDLS Series

Switches for Special Applications

HIGH CAPACITY LIMIT SWITCH



This series has a wide gap contact block that handles a higher make/break DC load. In addition, a special lever arm has a serrated shaft hole and a capscrew with locking nut for attaching the lever to the rotary shaft. (See inset.) This assures a firm grip on the operating shaft and positive retention of the lever adjustment.

FEATURES

- High DC current ratings
- 20 amp rating at 120 VAC (single pole)
- Plug in or non-plug in
- Positive retention lever arm

The need for precise operation, coupled with severe environmental conditions places rigid demands on any control. MICRO SWITCH satisfies these demands with its high capacity Heavy Duty Limit Switch, which is designed to perform reliably under these conditions.

ELECTRICAL RATINGS

Circuitry	Voltage	Single Pole		Double Pole	
 DPDT Double Break		Resistive Load	Inductive Load	Resistive Load	Inductive Load
	125 VDC	2.0A	1.0A	1.0A	0.4A
	250 VDC	0.7A	0.4A	0.4A	0.2A
	120 VAC	20A	20A	10A	10A
 SPDT Double Break	240 VAC	15A	15A	7.5A	7.5A
	480 VAC	10A	10A	5A	5A
	600 VAC	5A	5A	2.5A	2.5A

Maximum operating rate - 15 operations per minute

ORDER GUIDE INCLUDING LEVER

Catalog Listing	Description
LSQ051	Double pole, non-plug-in 3/4" Conduit opening
LSQ052	Double pole, plug-in 3/4" Conduit opening
LSQ053	Single pole, non-plug-in 1/2" Conduit opening
LSQ054	Single pole, plug-in 1/2" Conduit opening
LSZ616	Replacement lever for above listings

Limit/Enclosed

MANIFOLD MOUNT SWITCHES



Manifold mount HDLS limit switches have an opening for the lead wires through the gasketed mounting base. The gasket maintains the oil tightness when the switch is surface mounted.

The manifold mount switches are available in either single-pole or double-pole forms of the plug-in types only. Mounting and wiring of the single-pole and double-pole forms is completely interchangeable. Any operating head type can be provided.

Catalog listings of plug-in HDLS switches in the order guides can be converted to specify manifold mount versions.

SINGLE-POLE CATALOG LISTINGS

Convert a single-pole, standard duty rated switch listing to specify manifold mount by changing the fifth character in the catalog listing to **F**.

Example:

LSA1A — standard side rotary plug-in switch

LSA1F — above switch in manifold mount

Convert a single-pole, electronic duty switch listing by changing the fifth character in the catalog listing to **G**.

Example:

LSA1J — standard side rotary plug-in switch

LSA1G — above switch in manifold mount

LSZ4015 — plug-in base only.

DOUBLE-POLE CATALOG LISTINGS

Convert double-pole catalog listings (except LSL sequential action and LSM center neutral types) to specify manifold mount by changing the fourth and fifth characters in the catalog listing to **2F**.

Example:

LSA2B — standard side rotary plug-in switch

LSA2F — above switch in manifold mount

Change the fourth and fifth characters of LSM listings to **2H**.

Example:

LSM2D — center neutral switch

LSM2H — above switch in manifold mount

Change the fourth and fifth characters of LSL listings to **2G**.

Example:

LSL2C — sequential action switch

LSL2G — above switch in manifold mount

LSZ4016 — plug-in base only.

Limit and Enclosed Switches

Harsh Duty Epoxied Limit Switch

HDLS Series



Replacement head part number is metal stamped; won't wash off

Fulfills your actuation criteria
Wide variety of operating heads

Fluorocarbon diaphragm seal

Eliminate fluid infiltration
Epoxied construction

Try your "step test"
Zinc diecast housing, head & body

Additional body seal
Fluorocarbon sealed cover

High compression ridge

Your choice of termination options

No adjustment required over life of switch
All metal drive train

Superior sealing, keeps shaft moving freely
Twin fluorocarbon shaft seals
Superior corrosion resistance
Type 303 stainless steel shaft

Anti-corrosion
Phosphate sealed epoxy finish

Valuable trouble shooting tool
120 VAC neon or 24 V LED indicators available

Exceeds NEMA 6P

Machine processes and their associated fluids demand **more** than the standard NEMA 6P switch provides.

The Harsh Duty Limit Switch meets the environmental challenges found in actual automotive production facilities and food and beverage lines.

The MICRO SWITCH Harsh Duty Limit Switch is **made** for environments that surpass NEMA 6P test criteria.

Limit and Enclosed Switches

Fully Potted Limit Switches

HDLS Series



FEATURES

- Excellent sealing capability for withstanding Harsh Duty food and beverage wash downs and severe machine tool environments.
- Switch cavity epoxy filled
- Extra diaphragm sealing
- 12' STOOW-A cable or connector version (other lengths available)
- (Cable versions) NEMA 1, 6, 6P, 12
- (Connector versions) NEMA 1, 6, 6P, 12, 13
- All fluorocarbon seals (low temp. available)
- Exceeds NEMA 6P
- UL Listed, file #E37138
- CSA Certified, file #LR57326

The Totally Potted HDLS provides an extra degree of protection in harsh environments by sealing the basic switch cavity with epoxy. These switches are the same as the non plug-in HDLS except that the entire switch cavity is filled with epoxy in addition to the conduit entrance, and the switches are preleaded, either with cable or connectors.

HOW TO ORDER

Only the non plug-in HDLS switches can be converted to a Fully-Potted HDLS.

All indicators are wired to the N.O. terminals. (N.C. indicator available page A34.)

Limit/Enclosed

ORDER GUIDE – ROTARY ACTUATED SWITCHES

Circuitry	Body Style	Catalog Listing						
		Side Rotary						
		Standard	Low D.T.	5° P.T.	Low Torque	Low D.T. Low Torque	Maintained	Top Rotary High O.T. (1)
 SPDT Double-Break Elect. Rating: A	Preleaded w/cable	LSYAC3KP-FP	LSYPC3KP-FP	LSYUC3KP-FP	LSYRC3KP-FP	LSYHC3KP-FP	LSYNC3KP-FP	LSYBC3KP-FP
	Pre-wired w/connector	LSYAC3KQ-FP	LSYPC3KQ-FP	LSYUC3KQ-FP	LSYRC3KQ-FP	LSYHC3KQ-FP	LSYNC3KQ-FP	LSYBC3KQ-FP
	Preleaded w/cable 120 VAC Neon	LSYAC5KP-FP	LSYPC5KP-FP	LSYUC5KP-FP	LSYRC5KP-FP	LSYHC5KP-FP	LSYNC5KP-FP	LSYBC5KP-FP
	Pre-wired w/connector 120 VAC Neon	LSYAC5KQ-FP	LSYPC5KQ-FP	LSYUC5KQ-FP	LSYRC5KQ-FP	LSYHC5KQ-FP	LSYNC5KQ-FP	LSYBC5KQ-FP
 DPDT Double-Break Elect. Rating: B	Preleaded w/cable	LSYAC4LX-FP	LSYPC4LX-FP	LSYUC4LX-FP	LSYRC4LX-FP	LSYHC4LX-FP	LSYNC4LX-FP	LSYBC4LX-FP
	Pre-wired w/connector	LSYAC7LR-FP	LSYPC7LR-FP	LSYUC7LR-FP	LSYRC7LR-FP	LSYHC7LR-FP	LSYNC7LR-FP	LSYBC7LR-FP

(1) Top rotary version

ORDER GUIDE – SIDE ROTARY (Continued)

Circuitry	Body Style	Catalog Listing
 SPDT Double Break each direction Electrical Rating: B	Preleaded w/cable	LSYMC4NX-FP
	Pre-wired w/connector	LSYMC7NR-FP

ORDER GUIDE – SIDE ROTARY (Continued)

Circuitry	Body Style	Catalog Listing
 (2) SPDT Double Break with 10° between operation Electrical Rating: B	Preleaded w/cable	LSYLC4MX-FP
	Pre-wired w/connector	LSYLC7MR-FP

For low temperature applications, substitute “Y_B” for the “Y_C”.

See page A42 for temperature ratings.

See pages A57-A63 for drawings.

See pages A33 and A35 for operating characteristics.

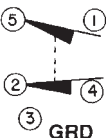
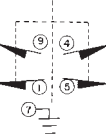
Other styles of fully potted limit switches are available than shown in this catalog. Consult the 800 number for further information.

Limit and Enclosed Switches

HDLS Series

Fully Potted Limit Switches

ORDER GUIDE – TOP PLUNGERS AND WOBBLE ACTUATORS

Circuitry	Body Style	Catalog Listing			
		Plain	Roller	Adjustable	Wobble Actuators
 <p>GRD SPDT Double-Break Elect. Rating: A</p>	Preleaded w/cable	LSYCC3KP-FP	LSYDC3KP-FP	LSYVC3KP-FP	LSYJC3KP-**FP
	Pre-wired w/connector	LSYCC3KQ-FP	LSYDC3KQ-FP	LSYVC3KQ-FP	LSYJC3KQ-**FP
	Preleaded w/cable 120 VAC Neon	LSYCC5KP-FP	LSYDC5KP-FP	LSYVC5KP-FP	LSYJC5KP-**FP
	Pre-wired w/connector 120 VAC Neon	LSYCC5KQ-FP	LSYDC5KQ-FP	LSYVC5KQ-FP	LSYJC5KQ-**FP
 <p>DPDT Double-Break Elect. Rating: B</p>	Preleaded w/cable	LSYCC4LX-FP	LSYDC4LX-FP	LSYVC4LX-FP	LSYJC4LX-**FP
	Pre-wired w/connector	LSYCC7LR-FP	LSYDC7LR-FP	LSYVC7LR-FP	LSYJC7LR-**FP

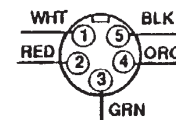
**WOBBLE ACTUATOR CODE:

		Head Style
7A	Delrin Rod	J
7M	Spring Wire	J
8A	Cat Whisker	K
7N	Cable	J
8C	Coil Spring	K

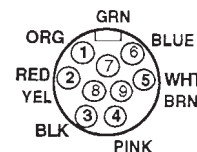
WIRING DIAGRAMS

Connectors = Numbers
Cables = Colors

Single-Pole



Double-Pole



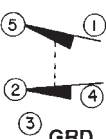
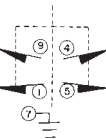
Pin numbers in wiring diagrams correspond to terminal numbers in circuitry diagrams on pages A45 and A46 only.

Electrical Ratings: Connector Versions

Mini	600 VAC, 7A
Micro	300 VAC, 3A

For cable versions see page A34.

ORDER GUIDE – SIDE PLUNGERS

Circuitry	Body Style	Catalog Listing			
		Plain	Roller	Adjustable	Maintained
 <p>GRD SPDT Double-Break Elect. Rating: A</p>	Preleaded w/cable	LSYEC3KP-FP	LSYFC3KP-FP	LSYWC3KP-FP	LSYGC3KP-FP
	Pre-wired w/connector	LSYEC3KQ-FP	LSYFC3KQ-FP	LSYWC3KQ-FP	LSYGC3KQ-FP
	Preleaded w/cable 120 VAC Neon	LSYEC5KP-FP	LSYFC5KP-FP	LSYWC5KP-FP	LSYGC5KP-FP
	Pre-wired w/connector 120 VAC Neon	LSYEC5KQ-FP	LSYFC5KQ-FP	LSYWC5KQ-FP	LSYGC5KQ-FP
 <p>DPDT Double-Break Elect. Rating: B</p>	Preleaded w/cable	LSYEC4LX-FP	LSYFC4LX-FP	LSYWC4LX-FP	LSYGC4LX-FP
	Pre-wired w/connector	LSYEC7LR-FP	LSYFC7LR-FP	LSYWC7LR-FP	LSYGC7LR-FP

MOUNTING DIMENSIONS (For reference only) see page A58

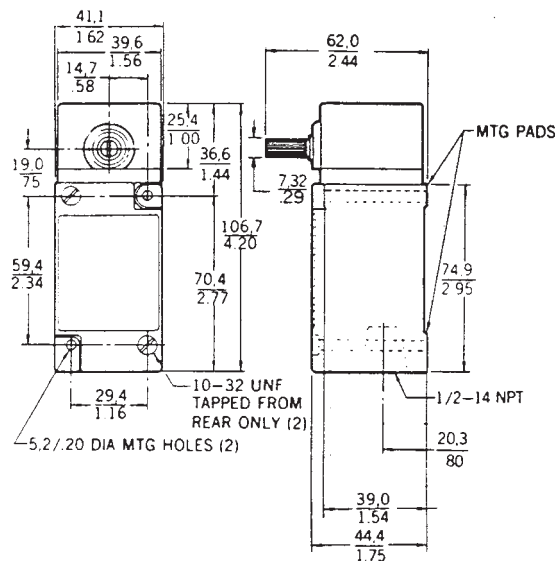
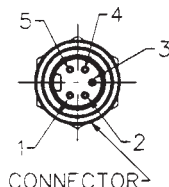
(2) All indicators wired to N.O. terminals.

Temperature Ratings:

	Dry	Wet
Connector version:	250° F (121° C)	212° F (100° C)
Cable version:	221° F (105° C)	140° F (60° C)

Mating Female Connectors

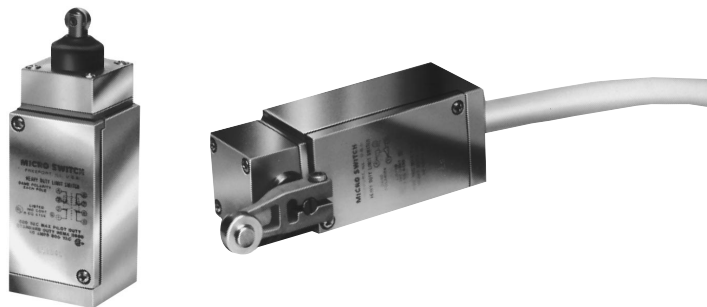
5 Pin		9 Pin
41306	3' cable	47001
41307	6' cable	47002
41308	12' cable	47003



Limit and Enclosed Switches

Stainless Steel

HDLS Series



FEATURES

- Corrosion-resistant stainless steel non-plug in body, head and rotary shaft
- Stainless steel levers
- Fluorocarbon seals
- -12°C to +121°C (10°F to +250°F)
- UL Listed, file #E37138
- CSA Certified, file #LR57326
- NEMA 1, 3, 3R, 4 4X, 6, 6P, and 13

The HDLS is available in all stainless steel versions. These switches are designed for use in highly corrosive environments such as petrochemical plants, food processing plants, shipboard, and dockside locations. The type 316 cast stainless steel body is designed to minimize crevices where food particles could become trapped. The actuator, operating head, and screws are also stainless steel. All seals are fluorocarbon to provide excellent chemical resistance and to withstand operating temperatures up to 121°C (250°F) and pressurized steam cleaning. Preleaded and epoxy filled versions are also available. Contact Freeport or nearest branch office for details. Interchangeable with standard HDLS mounting.

Limit/Enclosed

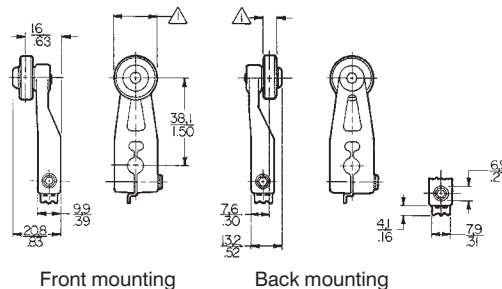
ORDER GUIDE STAINLESS STEEL SWITCHES

Head Type	Action	Circuitry	Catalog Listing*
Side rotary standard	Momentary	SPDT (1 N.O.-1 N.C.)	LS2A4K
Side rotary standard	Momentary	SPDT (1 N.O.-1 N.C.)	LS2YAB4K (Low Temp)
Side rotary low torque	Momentary	SPDT (1 N.O.-1 N.C.)	LS2H4K
Side rotary standard	Momentary	DPDT (2 N.O.-2 N.C.)	LS2A4L
Side rotary low torque	Momentary	DPDT (2 N.O.-2 N.C.)	LS2H4L
Side rotary standard	Momentary	SPNC (1 N.C. Direct Acting)	LS2A3N
Side rotary low torque	Momentary	SPNC (1 N.C. Direct Acting)	LS2H3N
Side rotary Center neutral standard	Momentary	SPDT each dir. (1 N.O.-1 N.C.) CW (1 N.O.-1 N.C.) CCW	LS2M4N
Side rotary	Maintained	SPDT (1 N.O.-1 N.C.)	LS2N3K (½" conduit)
Side plunger	Momentary	SPDT (1 N.O.-1 N.C.)	LS2E4K
Side plunger	Momentary	DPDT (2 N.O.-2 N.C.)	LS2E4L
Side roller plunger	Momentary	SPDT (1 N.O.-1 N.C.)	LS2F4K
Side roller plunger	Momentary	DPDT (2 N.O.-2 N.C.)	LS2F4L
Top roller plunger	Momentary	SPNC (1 N.C. Direct Acting)	LS2D3N
Top roller plunger	Momentary	SPDT (1 N.O.-1 N.C.)	LS2D4K
Top roller plunger	Momentary	DPDT (2 N.O.-2 N.C.)	LS2D4L

*SPDT 6 foot preleaded versions: add a **C** to the catalog listing. DPDT 6 foot preleaded versions; add **M** to the catalog listing. Example: LS2A4KC. For custom lead lengths, contact the 800 number.

ORDER GUIDE STAINLESS STEEL LEVERS

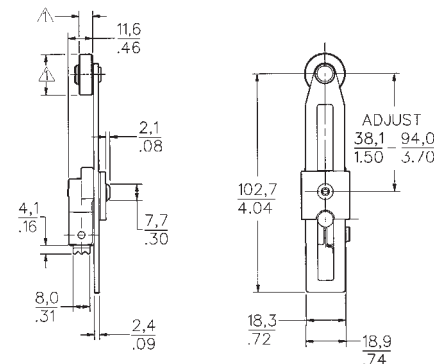
	Radius (In.)	Dia. (In.)	Width (In.)	Catalog Listing
Std. Roller Lever	1.5	.75	.25	LS2Z51B
Adjustable Radius	1.5-3.5	.75	.25	LS2Z52B
Rod	13.0	—	—	LS2Z54N



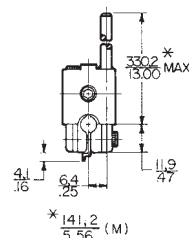
Front mounting

Back mounting

LS2Z52B



LS2Z54N



For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

Stainless Steel

OPERATING CHARACTERISTICS

	Head Type				
	Side Rotary Standard	Low Torque	Side Plunger Plain	Roller	Top Roller Plunger
Pretravel (max.)	15°	—	2,54 mm 1.00 in.	2,54 mm 1.00 in.	1,78 mm 0.70 in.
Differential Travel (max.)	SPDT 5° DPDT 7°	SPDT 3° DPDT 4°	0,64 mm .025 in.	0,64 mm .025 in.	0,38 mm .015 in.
Overtravel (min.)	60°	68°	4,83 mm .190 in.	4,83 mm .190 in.	4,83 mm .190 in.
Operating Force (max.)	—	—	26,7 Nm 6.0 lb.	26,7 Nm 6.0 lb.	17,8 Nm 4.0 lb.
Operating Torque (max.)	,45 Nm 4 in.lb.	,19 Nm 1.7 in.lb.	—	—	—
Operating Point	—	—	33 ± 76 mm 1.3 ± .03 in.	44,1 ± 1,02 mm 1.73 ± .04 in.	55,9 ± 1,02 mm 2.20 ± .04 in.

ELECTRICAL RATINGS

10 amps continuous carry

AC Volts

Pilot duty: 600 VAC, 720 VA

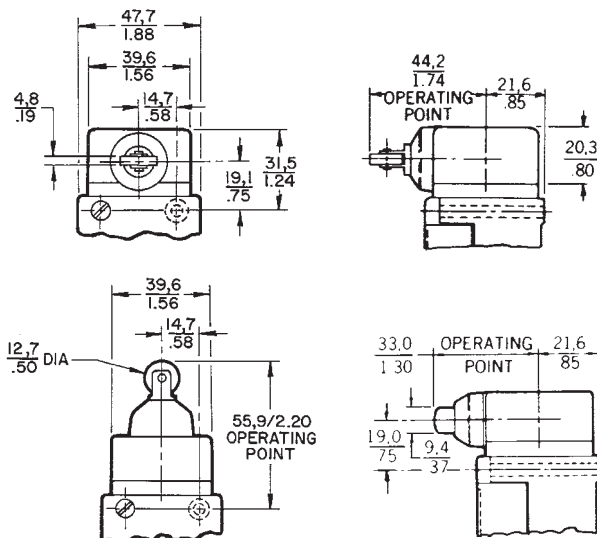
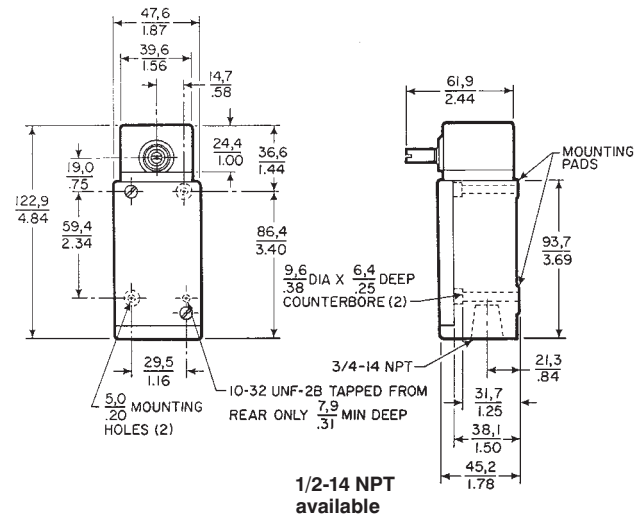
Electrical Rating	Circuitry	VAC	Amps at 0.35 Power Factor	
			Make	Break
A	Single-Pole Double-Throw	120	60	6
		240	30	3
		480	15	1.5
		600	12	1.2
B	Double-Pole Double-Throw	120	30	3
		240	15	1.5
		480	7.5	0.75
		600	6	0.60
D	Single-Pole Single-Throw Normally Closed	120	60	6
		240	30	3
		480	15	1.5
		600	12	1.2

DC Volts

Pilot duty: 240 VDC, 30 watts

Electrical Rating	Circuitry	VDC	Make and Break Amps	
			Inductive	Resistive
A	Single-Pole Double-Throw	120	0.25	0.8
		240	0.15	0.4
B	Double-Pole Double-Throw	120	0.25	0.8
		240	0.15	0.4
D	Single-Pole Single-Throw Normally Closed	30	4.3	4.3
		120	1.1	1.1

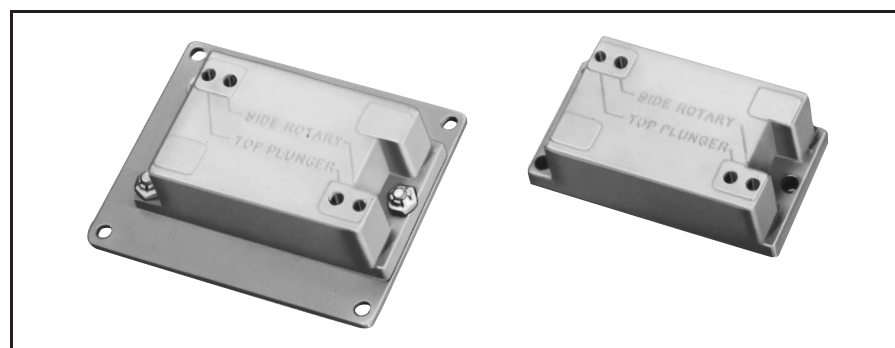
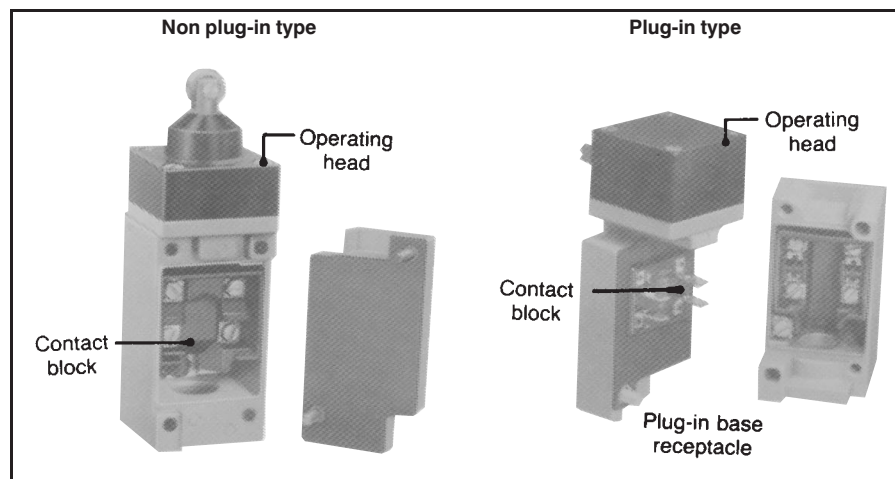
MOUNTING DIMENSIONS (For reference only)








Limit and Enclosed Switches

Modification and Replacement Parts

HDLS Series



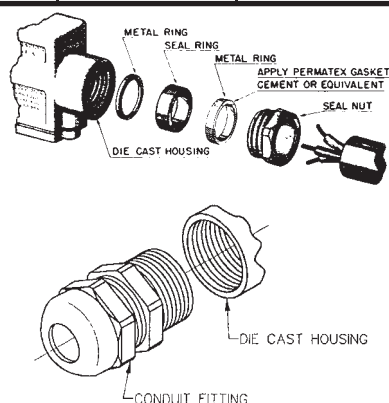
REPLACEMENT WOBBLE ACTUATORS

Catalog Listing				
				
Delrin Rod	Spring Wire	Cable	Cat Whisker	Coil Spring
LSZ4009	LSZ4010	LSZ4011	LSZ4012*	LSZ4014

*5½ inch long. For 7½" length, order LSZ4013.

MICRO SWITCH conduit sealing packets can be used with limit or enclosed switches. This includes the HDLS, Compact LS, ML, E6, V6, BAF1 or OP series switches.

The conduit sealing packets are not suitable for use with explosion-proof switches.



PLUG IN RECEPTACLES

Type	Catalog Listing
Single-Pole	LSZ4001
Double-Pole ¾ in. Conduit	LSZ4002
Double-Pole ½ in. Conduit	LSZ4006
Single-Pole Manifold Mount	LSZ4015
Double-Pole Manifold Mount	LSZ4016

ADAPTER PLATES

These adapter plates enable HDLS plug-in switches to retrofit 200LS series (single-pole) and 300LS series (double-pole) plug-in switches.

Type	Catalog Listing
Adapts 200LS series mounting to accept HDLS	LSZ4003
Adapts 300LS series mounting to accept HDLS	LSZ4004

INDICATOR LIGHTS/SEAL RING

Type	Catalog Listing
120V	LSZ4007
240V	LSZ4008

ADJUSTING TOOL KIT

This tool kit is used if readjustment of switches is necessary when heads and/or contact blocks are replaced.

Catalog Listing
LSZ4005

REPLACEMENT LEVERS

To order replacement levers, specify the same part number that is metal stamped on either the lever or lever hub.

For a complete list of HDLS replacement parts, refer to the charts on the following pages.

CONDUIT SEALING PACKETS

Catalog Listing Packet	Cable O.D. Inches
2PA6	.400" - .435"
2PA16	.435" - .470"
2PA1	.530" - .570"

LIQUID TIGHT CONDUIT FITTING

2PA17	.200" - .345" ½ NPT
2PA18	.270" - .460" ½ NPT
2PA19	.455" - .625" ¾ NPT
2PA20	.545" - .705" ¾ NPT

Limit/Enclosed

Limit and Enclosed Switches

HDLS Series

Replacement Parts

For low temperature or high temperature options, refer to example in LSA1A block.

PLUG-IN TYPE	1	2	3	4	5
Catalog Listing* On Switch Nameplate	Complete Plug-in Unit Less Base Receptacle	Plug-in Base Receptacle Only	Operating Head Only†	Contact Block Only	Actuator Only
Std. LSA1A Low Temp. LSYAB1A High Temp. LSYAC1A	LSZ7A1A LSZ7YAB1A LSZ7YAC1A	LSZ4001 LSZ4001 LSZ4001	LSZ1A LSZ1AB LSZ1AC	LSZ3A LSZ3A LSZ3A	
LSA5A	LSZ7A5A	LSZ4001	LSZ1A	LSZ3A	
LSA8A	LSZ7A8A	LSZ4001	LSZ1A	LSZ3A	
LSA1J	LSZ7A1J	LSZ4001	LSZ1A	LSZ3J	
LSA2B	LSZ7A2B	LSZ4002	LSZ1A	LSZ3B	
LSA6B	LSZ7A6B	LSZ4006	LSZ1A	LSZ3B	
LSB1A	LSZ7B1A	LSZ4001	LSZ1B	LSZ3A	
LSB1J	LSZ7B1J	LSZ4001	LSZ1B	LSZ3J	
LSB5A	LSZ7B5A	LSZ4001	LSZ1B	LSZ3A	
LSB8A	LSZ7B8A	LSZ4001	LSZ1B	LSZ3A	
LSB2B	LSZ7B2B	LSZ4002	LSZ1B	LSZ3B	
LSB6B	LSZ7B6B	LSZ4006	LSZ1B	LSZ3B	
LSC1A	LSZ7C1A	LSZ4001	LSZ1C	LSZ3A	
LSC1J	LSZ7C3J	LSZ4001	LSZ1C	LSZ3J	
LSC5A	LSZ7C5A	LSZ4001	LSZ1C	LSZ3A	
LSC8A	LSZ7C8A	LSZ4001	LSZ1C	LSZ3A	
LSC2B	LSZ7C2B	LSZ4002	LSZ1C	LSZ3B	
LSC6B	LSZ7C6B	LSZ4006	LSZ1C	LSZ3B	
LSD1A	LSZ7D1A	LSZ4001	LSZ1D	LSZ3A	
LSD1J	LSZ7D1J	LSZ4001	LSZ1D	LSZ3J	
LSD2B	LSZ7D2B	LSZ4002	LSZ1D	LSZ3B	
LSD5A	LSZ7D5A	LSZ4001	LSZ1D	LSZ3A	
LSD8A	LSZ7D8A	LSZ4001	LSZ1D	LSZ3A	
LSD6B	LSZ7D6B	LSZ4006	LSZ1D	LSZ3B	
LSE1A	LSZ7E1A	LSZ4001	LSZ1E	LSZ3A	

*Only partial listings are shown and necessary to determine replacement parts catalog listing. The listings with -7A, -7M, -7N, -8A, -8B and -8C are complete catalog listings.

Note: Complete units consist of Columns 1 and 2.

†For low temperature replacement heads add B. Example LSZ1AB. For fluorocarbon seal replacement heads add C. Example LSZ1AC.

Replacement Parts

PLUG-IN TYPE (Continued)

Limit/Enclosed

† For low temperature replacement heads add B. Example LSZ1AB. For fluorocarbon seal replacement heads add C. Example LSZ1AC.

Replacement Parts

PLUG-IN TYPE (Continued)

*Only partial listings are shown and necessary to determine replacement parts catalog listing. The listings with -7A, -7M, -7N, -8A, -8B and -8C are complete catalog listings.

Limit and Enclosed Switches

HDLS Series

Replacement Parts

PLUG-IN TYPE (Continued)					
Catalog Listing* On Switch Nameplate	Complete Plug-in Unit Less Base Receptacle	Plug-in Base Receptacle Only	Operating Head Only†	Contact Block Only	Actuator Only
LSL2C	LSZ7L2C	LSZ4002	LSZ1L	LSZ3C	
LSL6C	LSZ7L6C	LSZ4006	LSZ1L	LSZ3C	
LSM2D	LSZ7M2D	LSZ4002	LSZ1M	LSZ3C	
LSM6D	LSZ7M6D	LSZ4006	LSZ1M	LSZ3C	
LSN1A	LSZ7N1A	LSZ4001	LSZ1N		
LSN2B	LSZ7N2B	LSZ4002	LSZ1N		
LSN5A	LSZ7N5A	LSZ4001	LSZ1N		
LSN8A	LSZ7N8A	LSZ4001	LSZ1N		
LSN6B	LSZ7N6B	LSZ4006	LSZ1N		
LSP1A	LSZ7P1A	LSZ4001	LSZ1P	LSZ3A	
LSP1J	LSZ7P1J	LSZ4001	LSZ1P	LSZ3J	
LSP2B	LSZ7P2B	LSZ4002	LSZ1P	LSZ3B	
LSP5A	LSZ7P5A	LSZ4001	LSZ1P	LSZ3A	
LSP8A	LSZ7P8A	LSZ4001	LSZ1P	LSZ3A	
LSP6B	LSZ7P6B	LSZ4006	LSZ1P	LSZ3B	
LSR1A	LSZ7R1A	LSZ4001	LSZ1R	LSZ3A	
LSR2B	LSZ7R2B	LSZ4002	LSZ1R	LSZ3B	
LSR6B	LSZ7R6B	LSZ4006	LSZ1R	LSZ3B	
LSR5A	LSZ7R5A	LSZ4001	LSZ1R	LSZ3A	

*Only partial listings are shown and necessary to determine replacement parts catalog listing. The listings with -7A, -7M, -7N, -8A, -8B and -8C are complete catalog listings.

Note: Complete units consist of Columns 1 and 2.

† For low temperature replacement heads add B. Example LSZ1AB. For fluorocarbon seal replacement heads add C. Example LSZ1AC.

Limit/Enclosed

PLUG-IN TYPE (Continued)					
1		2		3	
4		5			
Catalog Listing* On Switch Nameplate	Complete Plug-in Unit Less Base Receptacle	Plug-in Base Receptacle Only	Operating Head Only†	Contact Block Only	Actuator Only
LSR8A	LSZ7R8A	LSZ4001	LSZ1R	LSZ3A	
LSS1H	LSZ7S1H	LSZ4001	LSZ1S	LSZ3H	
LSU1A	LSZ7U1A	LSZ4001	LSZ1U	LSZ3A	
LST1H	LSZ7T1H	LSZ4001	LSZ1T	LSZ3H	
LSU5A	LSZ7U5A	LSZ4001	LSZ1U	LSZ3A	
LSV1A	LSZ7V1A	LSZ4001	LSZ1V	LSZ3A	
LSV1J	LSZ7V1J	LSZ4001	LSZ1V	LSZ3J	
LSV5A	LSZ7V5A	LSZ4001	LSZ1V	LSZ3A	
LSV8A	LSZ7V8A	LSZ4001	LSZ1V	LSZ3A	
LSV2B	LSZ7V2B	LSZ4002	LSZ1V	LSZ3B	
LSV6B	LSZ7V6B	LSZ4006	LSZ1V	LSZ3B	
LSW1A	LSZ7W1A	LSZ4001	LSZ1W	LSZ3A	
LSW1J	LSZ7W1J	LSZ4001	LSZ1W	LSZ3J	
LSW5A	LSZ7W5A	LSZ4001	LSZ1W	LSZ3A	
LSW8A	LSZ7W8A	LSZ4001	LSZ1W	LSZ3A	
LSW2B	LSZ7W2B	LSZ4002	LSZ1W	LSZ3B	
LSW6B	LSZ7W6B	LSZ4006	LSZ1W	LSZ3B	

NON PLUG-IN TYPE (These parts will not form a complete switch)

Catalog Listing* On Switch Nameplate	Operating Head Only†	Contact Block Only	Actuator Only
LSA3K	LSZ1A	LSZ3K	
LSA4L	LSZ1A	LSZ3L	
LSA7L	LSZ1A	LSZ3L	
LSB3K	LSZ1B	LSZ3K	
LSB4L	LSZ1B	LSZ3L	
LSB7L	LSZ1B	LSZ3L	
LSC3K	LSZ1C	LSZ3K	
LSC4L	LSZ1C	LSZ3L	

Catalog Listing* On Switch Nameplate	Operating Head and Actuator‡	Contact Block Only	Actuator Only
LSJ7L-7A	LSZ1JGA	LSZ3L	LSZ4009
LSJ7L-7M	LSZ1JGM	LSZ3L	LSZ4010
LSJ4L-7N	LSZ1JGN	LSZ3L	LSZ4011
LSJ7L-7N	LSZ1JGN	LSZ3L	LSZ4011
LSK3K-8A	LSZ1KHA	LSZ3K	LSZ4012
LSK4L-8A	LSZ1KHA	LSZ3L	LSZ4012
LSK7L-8A	LSZ1KHA	LSZ3L	LSZ4012
LSK3K-8C	LSZ1KHC	LSZ3K	LSZ4014

*Only partial listings are shown and necessary to determine replacement parts catalog listing. The listings with -7A, -7M, -7N, -8A, -8B and -8C are complete catalog listings.

Note: Complete units consist of Columns 1 and 2.

‡ For low temperature replacement head and actuators add **B** between the fifth and sixth characters. Example LSZ1K**B**HA. For fluorocarbon seals add **C**. Example LSZ1K**C**HA.

Replacement Parts

NON PLUG-IN TYPE

Catalog Listing* On Switch Nameplate	Operating Head Only†	Contact Block Only	Actuator Only
LSC7L	LSZ1C	LSZ3L	
LSD3K	LSZ1D	LSZ3K	
LSD4L	LSZ1D	LSZ3L	
LSD7L	LSZ1D	LSZ3L	
LSE3K	LSZ1E	LSZ3K	
LSE4L	LSZ1E	LSZ3L	
LSE7L	LSZ1E	LSZ3L	
LSF3K	LSZ1F	LSZ3K	
LSF4L	LSZ1F	LSZ3L	
LSF7L	LSZ1F	LSZ3L	
LSG3K	LSZ1G		
LSG4L	LSZ1G		
LSG7L	LSZ1G		
LSH3K	LSZ1H	LSZ3K	
LSH4L	LSZ1H	LSZ3L	
LSH7L	LSZ1H	LSZ3L	

Catalog Listing* On Switch Nameplate	Operating Head and Actuator‡	Contact Block Only	Actuator Only
LSJ3K-7A	LSZ1JGA	LSZ3K	LSZ4009
LSJ3K-7M	LSZ1JGM	LSZ3K	LSZ4010
LSJ3K-7N	LSZ1JGN	LSZ3K	LSZ4011
LSJ4L-7A	LSZ1JGA	LSZ3L	LSZ4009
LSJ4L-7M	LSZ1JGM	LSZ3L	LSZ4010
LSK4L-8C	LSZ1KHC	LSZ3L	LSZ4014
LSK7L-8C	LSZ1KHC	LSZ3L	LSZ4014

‡ For low temperature replacement head and actuators add **B** between the fifth and sixth characters. Example: LSZ1K**B**HA. For fluorocarbon seals add **C**. Example LSZ1K**C**HA.

Catalog Listing* On Switch Nameplate	Operating Head Only†	Contact Block Only	Actuator Only
LSL4M	LSZ1L	LSZ3M	
LSL7M	LSZ1L	LSZ3M	
LSM4N	LSZ1M	LSZ3M	
LSM7N	LSZ1M	LSZ3M	
LSN3K	LSZ1N		
LSN4L	LSZ1N		
LSN7L	LSZ1N		
LSP3K	LSZ1P	LSZ3K	
LSP4L	LSZ1P	LSZ3L	
LSP7L	LSZ1P	LSZ3L	
LSR3K	LSZ1R	LSZ3K	
LSR4L	LSZ1R	LSZ3L	
LSR7L	LSZ1R	LSZ3L	
LSV3K	LSZ1V	LSZ3K	
LSV4L	LSZ1V	LSZ3L	
LSV7L	LSZ1V	LSZ3L	
LSW3K	LSZ1W	LSZ3K	
LSW4L	LSZ1W	LSZ3L	
LSW7L	LSZ1W	LSZ3L	

REPLACEMENT PARTS FOR STAINLESS STEEL HDLS

Listing	Operating Head	Contact Block
LS2A3N	LS2Z1A	N/A
LS2A4K	LS2Z1A	LSZ3K
LS2A4L	LS2Z1A	LSZ3L
LS2D4K	LS2Z1D	LSZ3K
LS2D4L	LS2Z1D	LSZ3L
LS2E4K	LS2Z1E	LSZ3K
LS2E4L	LS2Z1E	LSZ3L
LS2F4K	LS2Z1F	LSZ3K
LS2F4L	LS2Z1F	LSZ3L
LS2H3K	LS2Z1H	LSZ3K
LS2H4K	LS2Z1H	LSZ3K
LS2H4L	LS2Z1H	LSZ3L
LS2M4N	LS2Z1M	LSZ3M
LS2N3K	LS2Z1N	LSZ3K

*Only partial listings are shown and necessary to determine replacement parts catalog listing. The listings with -7A, -7M, -7N, -8A, -8B and -8C are complete catalog listings.

† For low temperature replacement heads add **B**. Example LSZ1**B**A. For fluorocarbon seal replacement heads add **C**. Example LSZ1**C**A.

Limit/Enclosed

Limit and Enclosed Switches

HDLS Series

Temperature and Performance Data

TABLE 1—TEMPERATURE LIMITS

	Standard HDLS				Low Temperature HDLS				High Temperature HDLS (Fluorocarbon Sealed*)		
	Low Limit		High Limit		Low Limit		High Limit		Low Limit		High Limit
	10°F -12°C	30°F -1°C	200°F 93°C	250°F 121°C	-40°F -40°C	-20°F -29°C	200°F 93°C	250°F 121°C	10°F -12°C	30°F -1°C	250°F 121°C
LSA—Side Rotary Momentary	X			X	X			X	X		X
LSB—Top Rotary		X		X		X		X		X	X
LSC—Top Plain Plunger	X		X			X	X		X		X
LSD—Top Roller Plunger	X		X			X	X		X		X
LSE—Side Plain Plunger	X		X			X	X		X		X
LSF—Side Roller Plunger	X		X			X	X		X		X
LSG—Side Plunger Maintained		X	X			X	X			X	X
LSH—Side Rotary, Low P.T., Low Torque		X		X		X		X		X	X
LSJ—Wobble Stick	X		X		X			X	X		X
LSK—Cat Whisker	X		X			X		X	X		X
LSL—Side Rotary Sequence	X			X	X			X	X		X
LSM—Side Rotary Center Neutral		X		X	X			X		X	X
LSN—Side Rotary Maintained		X		X		X		X		X	X
LSP—Side Rotary, Low Pretravel	X			X	X			X	X		X
LSR—Side Rotary, Low Torque		X		X		X		X		X	X
LSV—Top Adjustable Plunger	X		X			X	X		X		X
LSW—Side Adjustable Plunger	X		X			X	X		X		X

*For HDLS application wherein the upper temperature limit is normally above 200°F (93°C), much longer switch life can be obtained by using completely fluorocarbon-sealed switches rather than the standard HDLS.

TABLE 2—ENVIRONMENTAL SEAL PERFORMANCE

Std. Seals	Cellulube	Detergent	5 Star	ASTM #1	ASTM #2	ASTM #3	ASTM #4	Houghto Safe 260, 271	Houghto Safe 1010, 1055, 1120	Mineral Oil	Petr. Oil Crude	Silicon Gr. & Oil	Sunsafe	Beer	Stoddard Solv.	Chlorinated Solvents	Citric Acids	Di-ester Syn. Lubricant	Ozone	Pydraul	Pyroguard	Petr. Base Hydraulic Oil	Lard Oil	Silicate Esters
LSA	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSB	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSC	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSD	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSE	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSF	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSG	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSH	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSJ	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSK	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSL	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSM	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSN	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSP	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSR	4	1	1	1	1	1	2	1	4	1	1	1	1	1	1	4	1	2	4	4	4	1	1	2
LSV	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2
LSW	4	2	2	1	2	4	4	2	4	2	2	1	2	1	2	4	1	4	3	4	4	2	2	2

All HDLS with seals of:

Fluorisilicone (Low Temp. HDLS)	4	1	1	1	1	1	2	2	4	1	1	1	1	1	1	1	1	2	1	4	4	1	1	1
Fluorocarbon (High Temp. HDLS)	1*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

*Fluorocarbon seals good for all Cellulubes Except A60.CODE:

1 = Satisfactory
2 = Fair

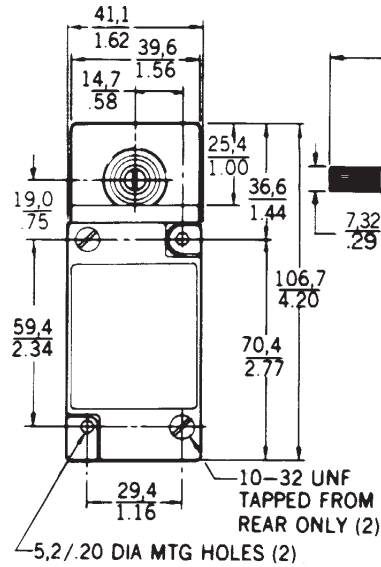
3 = Doubtful
4 = Unsatisfactory

Limit and Enclosed Switches

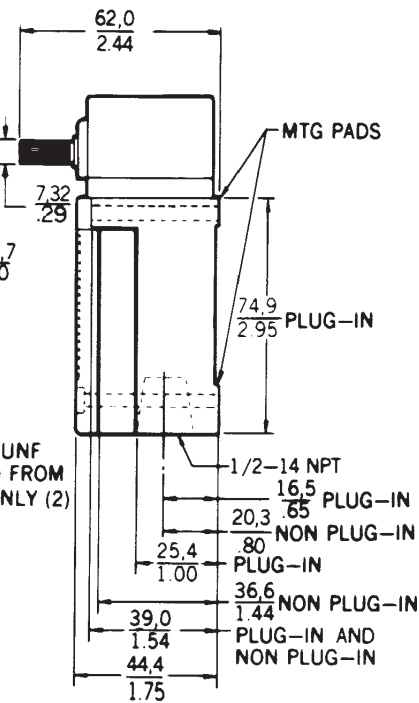
Mounting Dimensions (For reference only)

HDLS Series

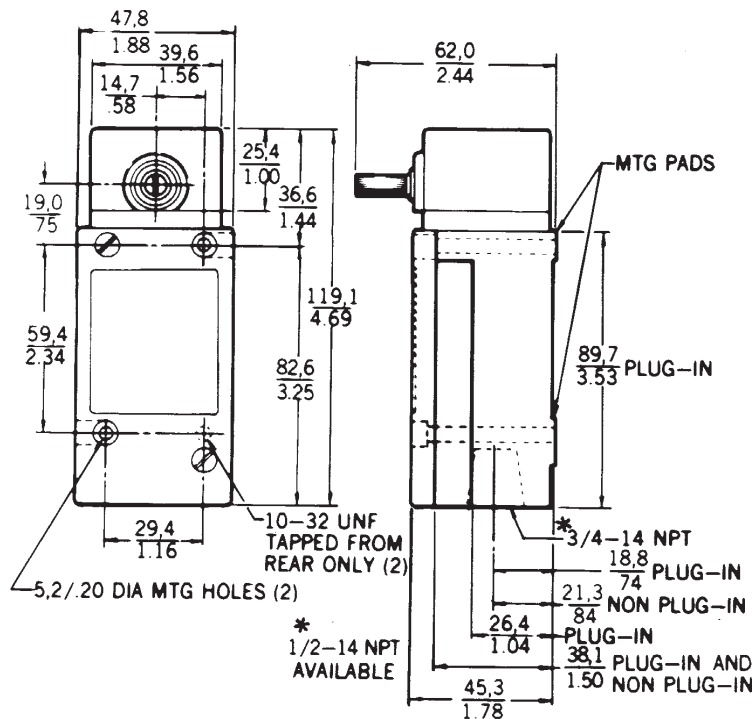
SIDE ROTARY



Single-pole



Double-pole



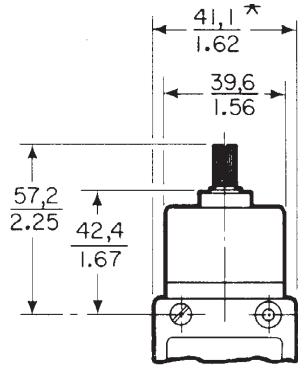
Limit/Enclosed

Limit and Enclosed Switches

HDLS Series

Mounting Dimensions (For reference only)

TOP ROTARY Single-pole

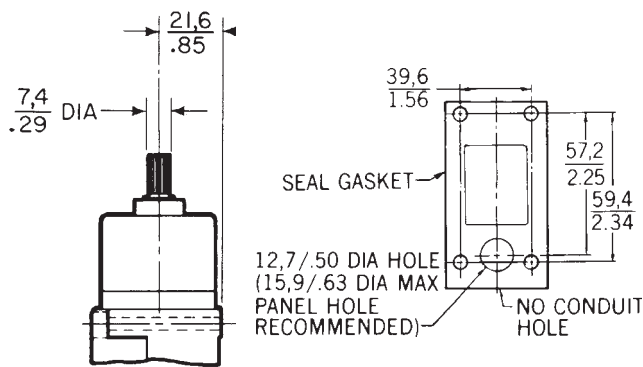


* 47.5
1.87

Single-Pole

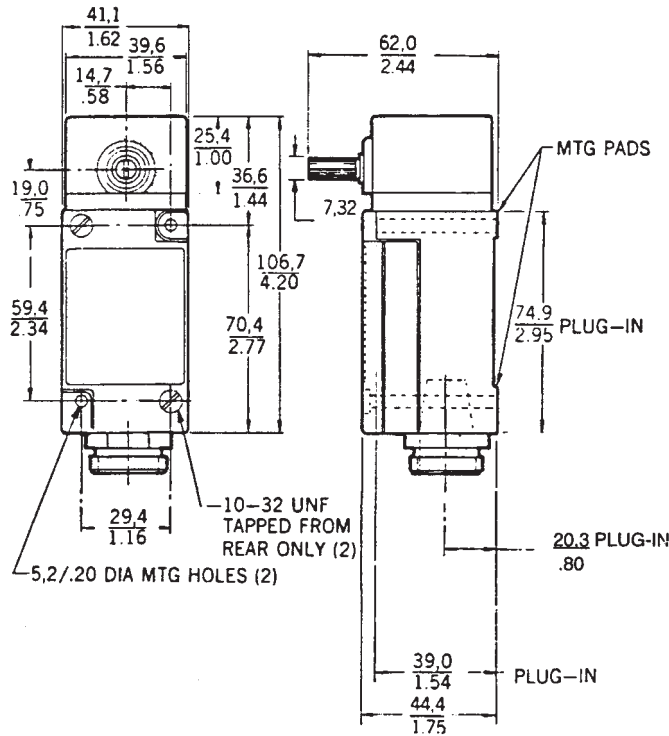
Double-Pole Dimension

MANIFOLD MOUNT (Plug-in only) Single-pole and double-pole



NEMA 6P PRE-WIRED SIDE ROTARY

Single-pole

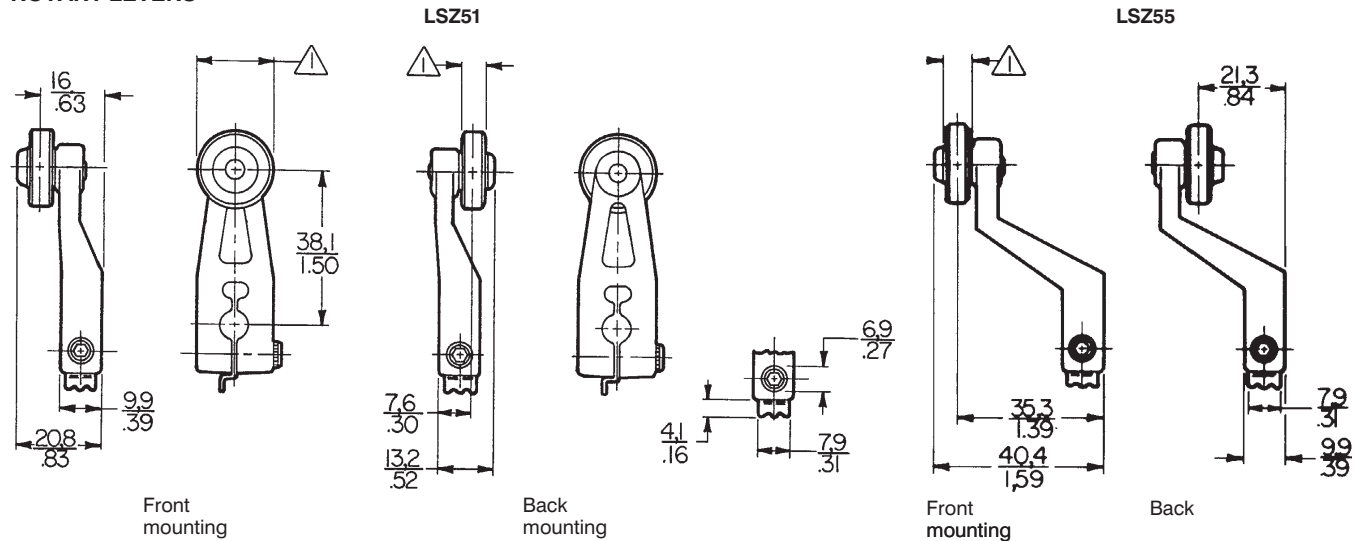


Limit and Enclosed Switches

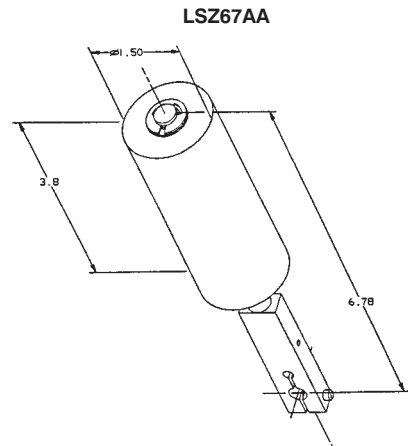
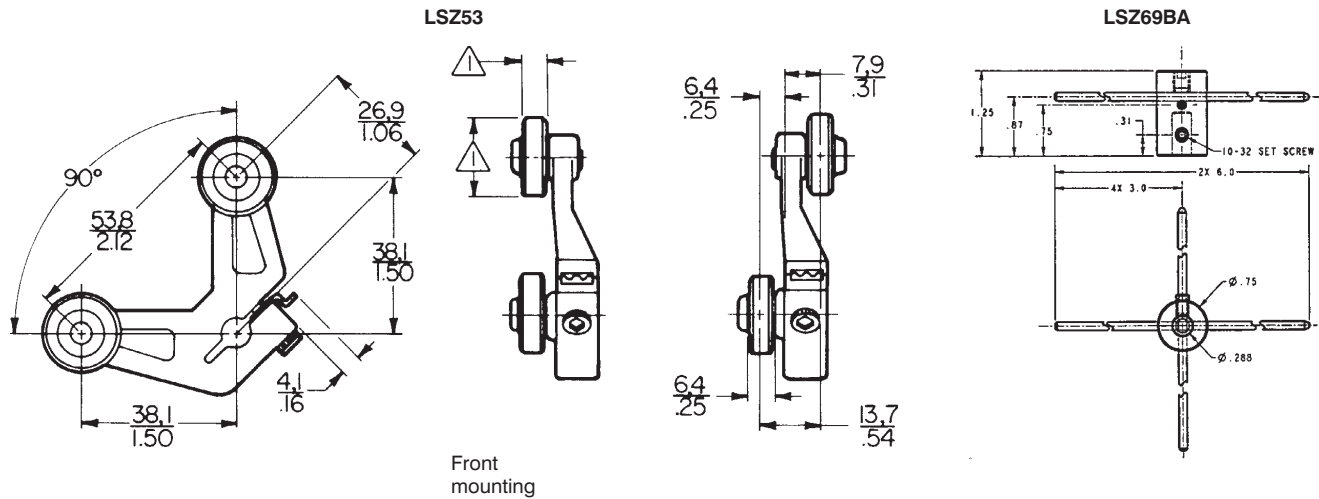
HDLS Series

Mounting Dimensions (For reference only)

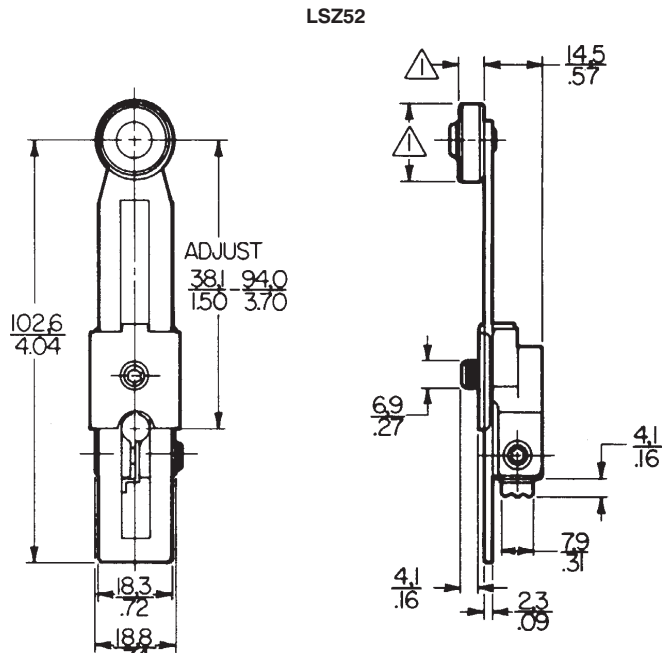
ROTARY LEVERS



Limit/Enclosed



See order guides for roller dimensions.

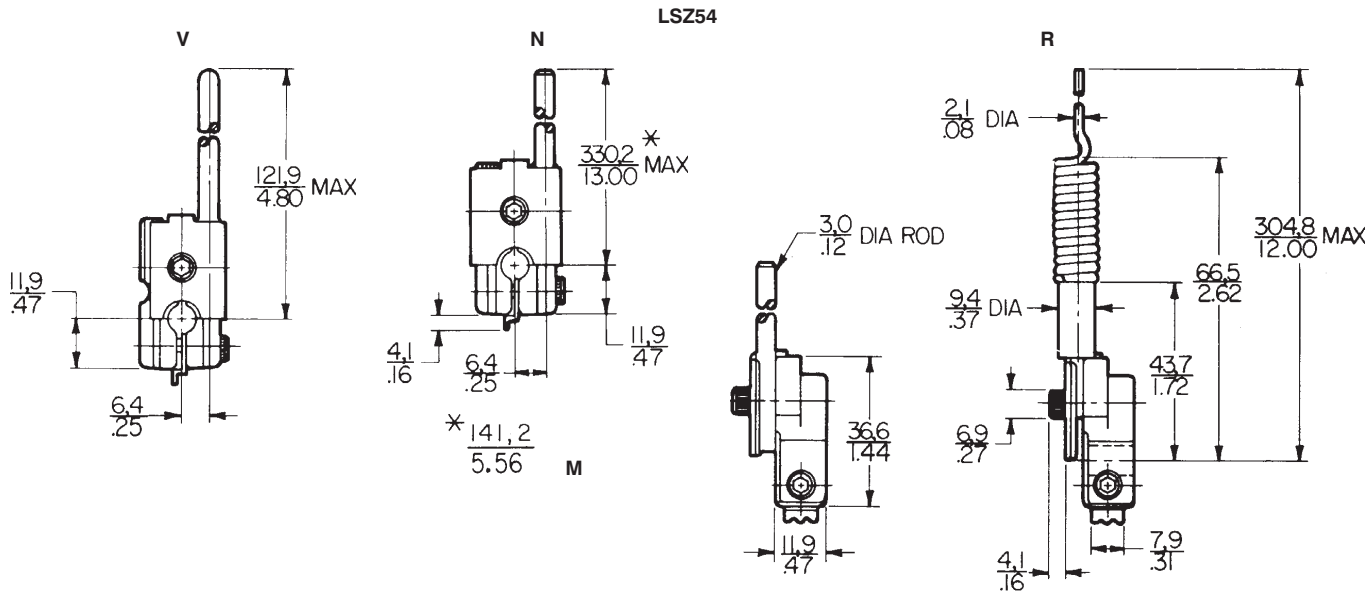


Limit and Enclosed Switches

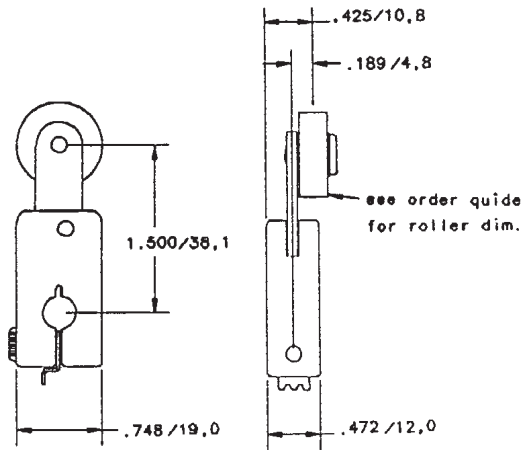
HDLS Series

Mounting Dimensions (For reference only)

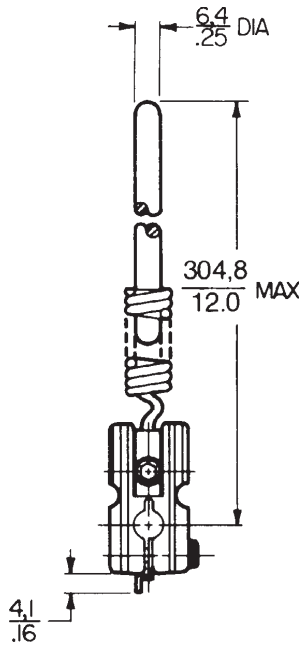
ROTARY LEVERS



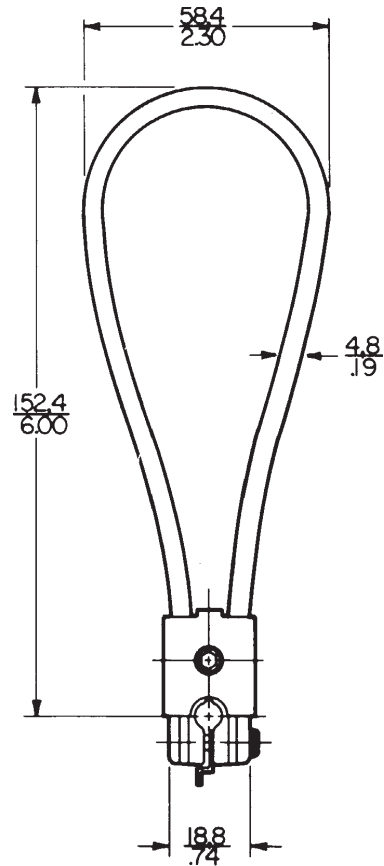
LSZ60



LSZ68



LSZ61



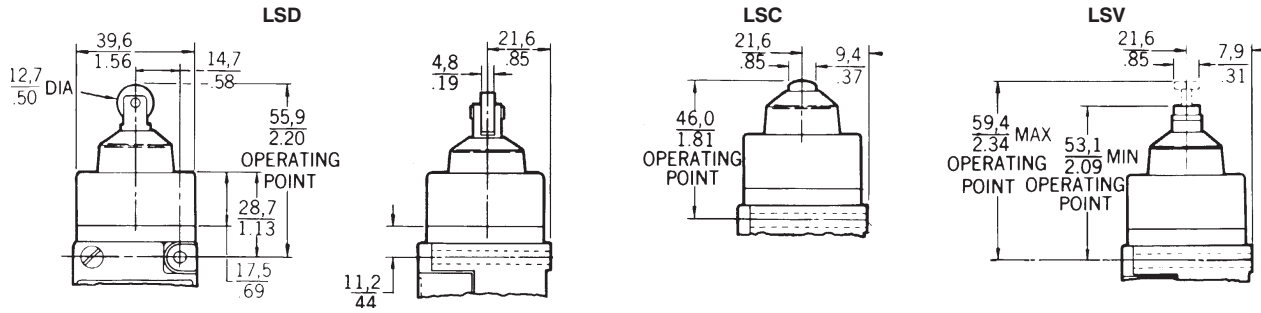
Limit and Enclosed Switches

HDLS Series

Mounting Dimensions (For reference only)

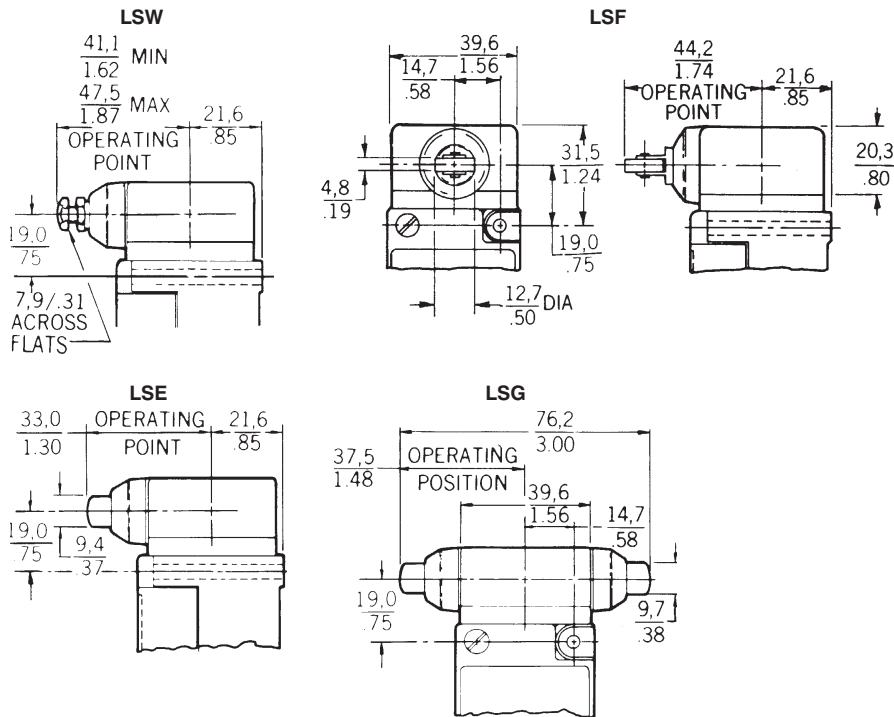
TOP PLUNGERS

Single-pole and double-pole



SIDE PLUNGERS

Single-pole and double-pole



Key: 0.0 = mm
0.00 = inches

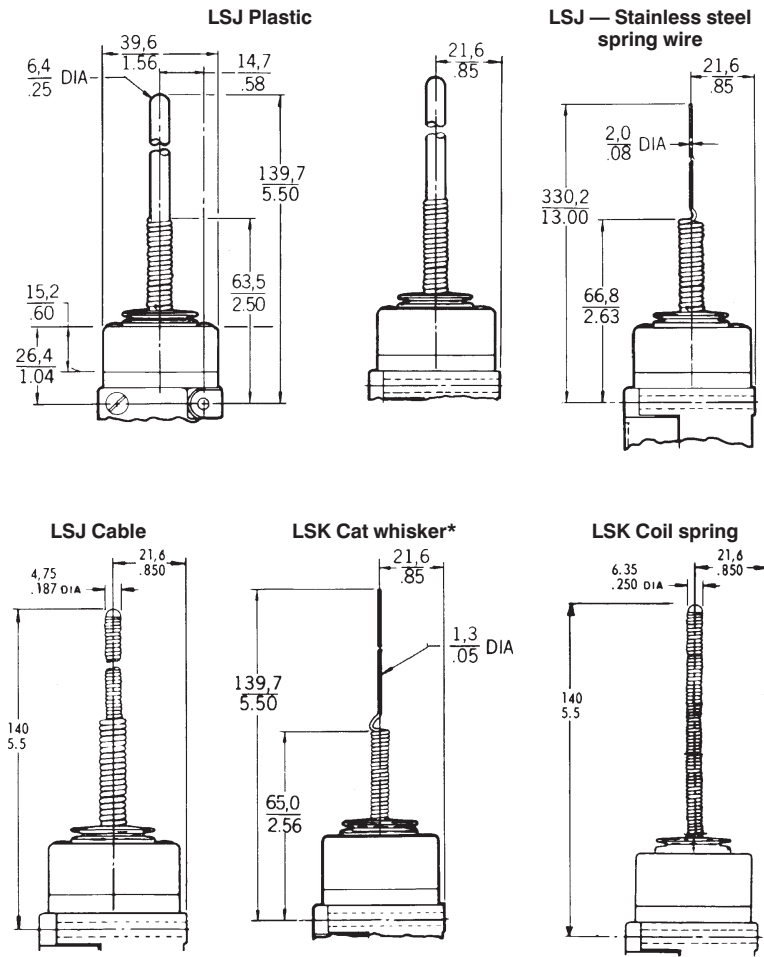
Limit/Enclosed

Limit and Enclosed Switches

HDLS Series

Mounting Dimensions (For reference only)

WOBBLE LEVERS



* Also available with 7½" actuator.

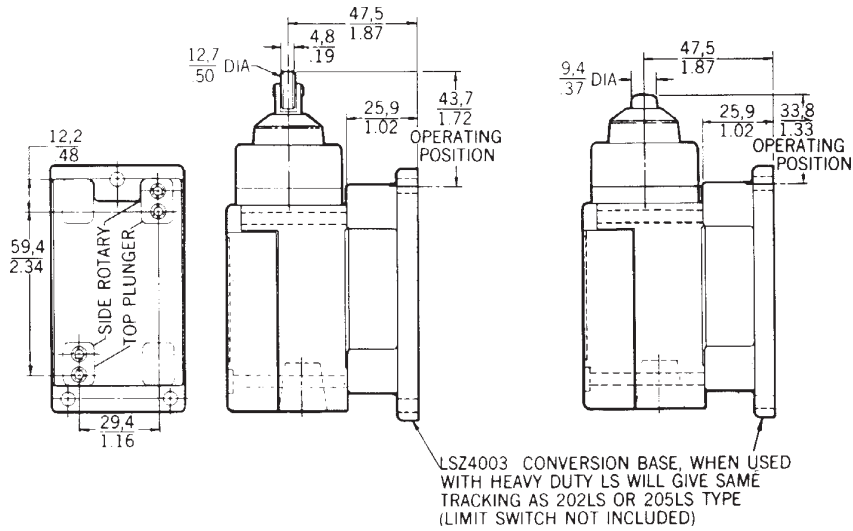
Key: 0,0 = mm
0.00 = inches

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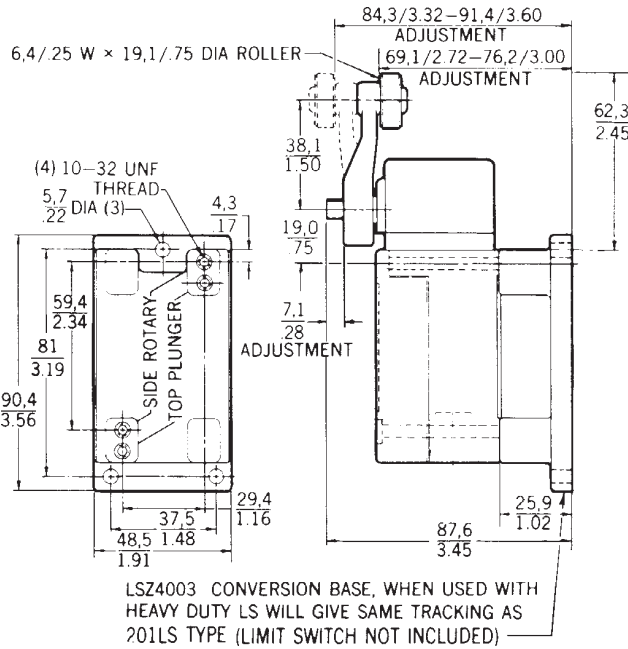
Mounting Dimensions (For reference only)

CONVERSION BASES

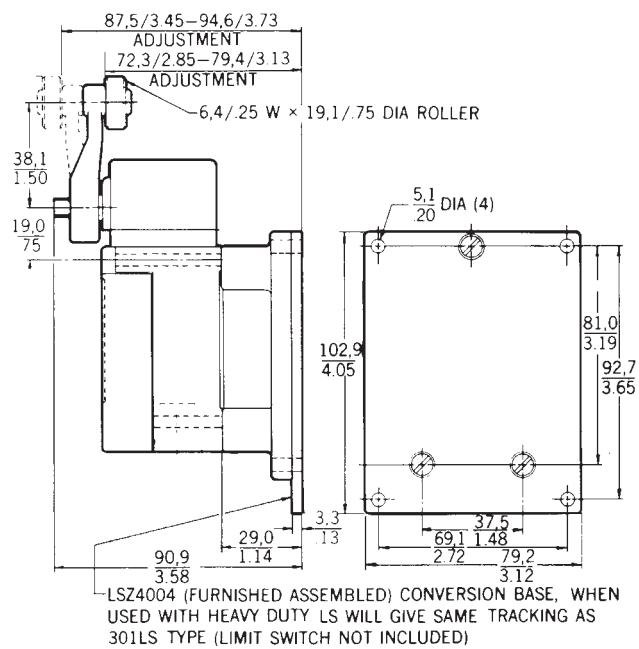
SINGLE-POLE TOP PLUNGER LSZ4003



SINGLE-POLE SIDE ROTARY LSZ4003



DOUBLE-POLE SIDE ROTARY LSZ4004



Limit/Enclosed

LS/200LS Cross-Reference

The following cross-reference between compact LS/plug-in 200LS switches and HDLS switches applies to style, but not necessarily operating characteristics. When replacing LS/200LS with HDLS switches, the new characteristics should be considered.

The HDLS requires an adapter plate to interchange with 200LS (see page A41).

NON PLUG-IN

LS	HDLS	(Consisting Of)
1LS1	LSA3K-1D	(LSA3K + LSZ51D)
1LS1-L	LSA3K-1D	(LSA3K + LSZ51D)
1LS1-N	LSA3K-1C	(LSA3K1 + LSZ51C)
1LS1-NA	LSA3K1-1C	(LSA3K1 + LSZ51C)
1LS2	LSA3K	—
1LS3	LSA3K-2C	(LSA3K + LSZ52C)
1LS3-L	LSA3K-2C	(LSA3K + LSZ52C)
1LS5	LSR3K-1C	(LSR3K + LSZ51C)
1LS6	LSR3K-1D	(LSR3K + LSZ51D)
1LS9	LSP3K	—
1LS10	LSR3K-4M	(LSR3K + LSZ54M)
1LS10-L	LSR3K-4M	(LSR3K + LSZ54M)
1LS19	LSR3K-1D	(LSP3K + LSZ51D)
1LS23	LSR3K	—
1LS27	LSP3K5	—
1LS34	LSR3K-1C	(LSR3K + LSZ51C)
1LS47	LSH3K-4M	(LSH3K + LSZ54M)
1LS58	LSP3K-2C	(LSP3K + LSZ52C)
1LS59	LSH3K-2C	(LSH3K + LSZ52C)
1LS128	LSA3K-2K	(LSA3K + LSZ52K)
1LS131	LSH3K-1D	(LSH3K + LSZ51D)
1LS139	LSR3K-4M	(LSR3K + LSZ54M)
1LS145	LSH3K-2M	(LSH3K + LSZ52M)
1LS156	LSA3K-1C	(LSA3K + LSZ51C)
1LS165-L	LSA3K4-2C	(LSA3K4 + LSZ52C)
1LS212	LSH3K	—
1LS213	LSH3K	—
2LS1	LSC3K	—
2LS1-L	LSC3K	—
2LS7	LSC3K	—

LS	HDLS	(Consisting Of)
3LS1	LSF3K	—
3LS1-L	LSF3K	—
3LS5	LSF3K4	—
4LS1	LSE3K	—
4LS1-L	LSE3K	—
5LS1	LSD3K	—
5LS1-L	LSD3K	—
5LS6	LSD3K6	—
5LS6-L	LSD3K6	—
5LS7	LSD3K6	—
5LS8	LSD3K	—
6LS1	LSN3K-3B	(LSN3K + LSZ53B)
6LS1-L	—	—
6LS2	LSN3K	—
6LS2-L	LSN3K	—
6LS3	LSN3K-3S	(LSN3K + LSZ53S)
8LS1	LSJ3K-7N	—
8LS1-L	LSJ3K-7N	—
8LS4	LSK3K-8B	—
8LS125	LSK3K-8B	—
11LS1	LSA7L-1D	(LSA7L + LSZ51D)
11LS2	LSA7L	—
11LS3	LSA7L-2C	(LSA7L + LSZ52C)
11LS10	LSR7L-4M	(LSR7L + LSZ54M)
11LS156	LSA7L-1D	(LSA7L + LSZ51D)
12LS1	LSC7L	—
13LS1	LSF7L	—
14LS1	LSE7L	—
14LS3	LSE7L5	—
15LS1	LSD7L	—
15LS8	LSD7L	—

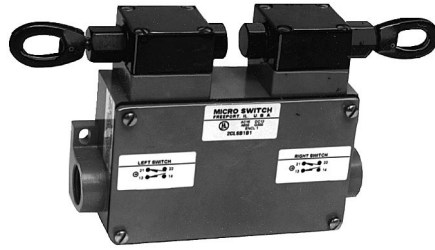
PLUG-IN

200LS*	HDLS	(Consisting Of)
201LS1	LSA1A-1D	(LSA1A + LSZ51D)
201LS1-N	LSA1A1-1C	(LSA1A1 + LSZ51C)
201LS2	LSA1A	—
201LS3	LSA1A-2C	(LSA1A + LSZ52C)
201LS6	LSR1A-1D	(LSR1A + LSZ51D)
201LS9	LSP1A	—
201LS10	LSR1A-4M	(LSR1A + LSZ54M)
201LS19	LSP1A-1D	(LSP1A + LSZ51D)
201LS23	LSR1A	—
201LS47	LSH1A-4M	(LSH1A + LSZ54M)
201LS143	LSA1A-2D	(LSA1A + LSZ52D)
201LS501	LSA5A-1D	(LSA5A + LSZ51D)
201LS501-A1	LSA8A-1D	(LSA8A + LSZ51D)
201LS502	LSA5A	—
201LS503	LSA5A-2C	(LSA5A + LSZ52C)
201LS503-A1	LSA8A-2C	(LSA8A + LSZ52C)
201LS510	LSR5A-4M	(LSR5A + LSZ54M)
202LS1	LSC1A	—
202LS7	LSC1A	—
202LS8	—	—

* Require terminal block (18PA1 for 200 series, 18PA3 for 300 series), which must be ordered separately.

200LS/300LS*	HDLS	(Consisting Of)
203LS1	LSF1A	—
203LS501	LSF5A	—
204LS1	LSE1A	—
204LS501	LSE5A	—
205LS1	LSD1A	—
205LS7	LSD1A3	—
205LS8	LSD1A	—
205LS501	LSD5A	—
206LS1	LSN1A-3B	(LSN1A + LSZ53B)
206LS2	LSN1A	—
208LS1	LSJ1A-7N	—
208LS125	LSK1A-8B	—
208LS501	LSJ5A-7N	—
208LS525	LSK5A-8B	—
301LS1	LSM2D-1D	(LSM2D + LSZ51D)
301LS2	LSM2D	—
301LS3	LSM2D-2C	(LSM2D + LSZ52C)
301LS5	LSM2D-4N	(LSM2D + LSZ54N)
301LS8	LSA2B-1D	(LSA2B + LSZ51D)
301LS28	LSA2B	—

Momentary Cable Pull Limit Switches: For Signaling Applications



MOMENTARY (CONTACT SWITCH) OPERATING HEAD

Momentary CLS Series Cable Pull Limit Switches are designed for signaling applications; they are not to be used as emergency stop devices. (For emergency stop applications, see the Maintained Cable Pull Limit Switches in the Safety Products catalog.)

When using direct acting contacts, Momentary Cable Pull Limit Switches provide a means to manually force disconnection of a normally closed control circuit by pulling on an attached cable. Momentary switches cause contact transfer if the cable is manually pulled and held. When the cable is released, switch contacts return to their original state. Momentary switches have either direct-acting contacts or snap-action contacts.

Cable length may be up to 200 ft. in a straight line for Single Head switches, and up to 400 ft. (200 ft. in each direction) for Duplex Head switches.

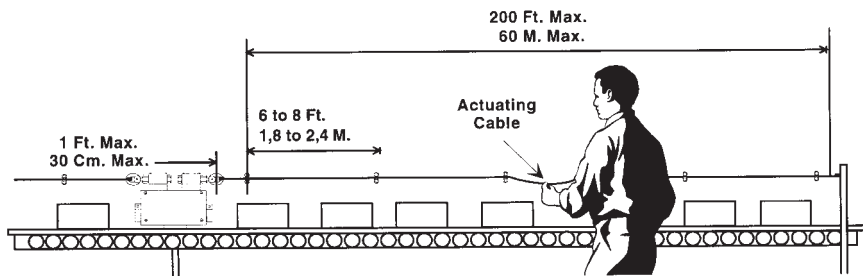
FEATURES

- Offered in Single Head and Duplex Head versions
- Optional direct acting contacts enhance reliability
- Duplex Head switches cover up to 400 ft. cable spans (200 ft. in each direction)
- Single Head switches have one normally open auxiliary contact, while Duplex Head switches have up to three normally open and two normally closed auxiliary contacts
- Four conduit opening thread size options: 1/2-14 NPT, 20mm, PF1/2 and PG13.5
- Compact size of Single Head switches fits into tight spaces
- Sealed to NEMA 1, 3, 4 and 13
- Smart Distributed System output available on Duplex version for monitoring only
- UL listed
- CSA certified
- CE certified
- Temperature range: -1° to 70°C (30° to 158°F)
- Available with indicators
- Duplex versions available with high visibility pilot light

TYPICAL APPLICATIONS

- Conveyors
- Packaging machinery
- Assembly lines
- Process equipment
- Transfer lines

TYPICAL DUPLEX HEAD SWITCH INSTALLATION



Limit/Enclosed

Limit and Enclosed Switches

CLS Series

Momentary Cable Pull Limit Switches: For Signaling Applications

TECHNICAL DATA CLS SERIES SPECIFICATIONS

Electrical		
Rate thermal current	$I_{th} = 10\text{ A}$	
Rate insulation voltage	$U_i = 660\text{ VAC}/660\text{ VDC}$	
Impulse voltage	$U_{mp} = 2.5\text{ kV}$	
Contact resistance	< 25 milliohms	
Operating rating	AC15	$U = 600\text{ V}; I = 1.2\text{ A}$
		$U = 240\text{ V}; I = 3\text{ A}$
		$U = 120\text{ V}; I = 6\text{ A}$
	DC13	$U = 250\text{ V}; I = 0.27\text{ A}$
		$U = 24\text{ V}; I = 2.8\text{ A}$
UL/CSA	A600/Q300	
Mechanical		
Protection class	NEMA 1, 3, 4 and 13	
Mechanical life	10 ⁵ operations maximum	
Temperature Range	-1° to 70°C (30° to 158°F)	
Terminal identification	Numbering to EN50013	
Head/housing material	Zinc die cast	

CABLE PULL SWITCH CHARACTERISTICS

Momentary Cable Pull Limit Switches are offered with a black operating head and a blue body. There is a choice of four different conduit openings: 1/2-14 NPT, 20mm, PF 1/2, and PG13.5. Duplex switches have 3 standard conduit openings with two conduit plugs provided.

All switches come with a 1NO auxiliary contact as standard.

An additional auxiliary switch is also available in the Duplex. This auxiliary switch may be configured as 1NO - 1NC direct acting, 2NO - 2NC snap action (monitoring only) or 1NO - 1NC with Smart Distributed System output (monitoring only).

Neon and LED indicators are available. A 6 watt incandescent pilot light is available on the Duplex for high visibility at long distances.

SMART DISTRIBUTED SYSTEM OUTPUT VERSION

The Smart Distributed System Output Version provides Smart Distributed System compatible switch status messaging. The primary contact block (NC) must be wired to the control current. The auxiliary contact block has been replaced with the Smart Distributed System circuitry.

NOTICE

Snap action contact blocks and the Smart Distributed Output Version should be used for monitoring only. These types of switches should not be used in control circuits.

Momentary Cable Pull Limit Switches: For Signaling Applications

SINGLE HEAD CLS ORDER GUIDE

CLS

BODY CODE

A BLUE BODY – PG13.5
B BLUE BODY – 1/2 NPT
C BLUE BODY – 20MM
D BLUE BODY – PF1/2

MODIFICATION CODES

1 HEAD ASSEMBLED WITH ACTUATOR TO THE LEFT
2 HEAD ASSEMBLED WITH ACTUATOR TO THE FRONT
3 HEAD ASSEMBLED WITH ACTUATOR TO THE MOUNTING SURFACE

BASIC SWITCH CODE

3 1NO-1NC SNAP ACTION (Monitoring Only)
4 1NO-1NC DIRECT ACTING
5 1NO-1NC DIRECT ACTING 240V NEON INDICATOR
6 1NO-1NC DIRECT ACTING 120V NEON INDICATOR
7 1NO-1NC DIRECT ACTING 24V LED INDICATOR

HEAD CODES

B MOMENTARY

- Notes:
- Leave the MODIFICATION CODE blank if a modification is not required.
 - Standard head orientation is with actuator to the right.
 - Unit may be field modified.

EXAMPLE CATALOG LISTING

Catalog Listing	Description
CLSD4B-1	Single Head Cable Pull Limit Switch, Blue Body – PF 1/2, 1NO - 1NC Direct Acting, Momentary, Head assembled with actuator to the left

DUPLEX HEAD 2CLS ORDER GUIDE

2CLS

BODY CODE

A BLUE BODY – PG13.5
B BLUE BODY – 1/2 NPT
C BLUE BODY – 20MM
D BLUE BODY – PF1/2

MODIFICATION CODES

(See chart below for numbered modification codes.)

INDICATOR – PILOT LIGHT CODE

A 120V – 6W RED PILOT LIGHT
B 120V NEON INDICATOR
C 240V NEON INDICATOR
D 24V LED INDICATOR

PRIMARY BASIC SWITCH CODE – LEFT

1 1NO – 1NC DIRECT ACTING

OPERATING HEAD

B MOMENTARY, BOTH SIDES

AUXILIARY BASIC SWITCH CODE – RIGHT

1 1NO – 1NC DIRECT ACTING
3 2NO – 2NC (DPDT) SNAP ACTION (Monitoring Only)
4 1NO – 1NC WITH SDS OUTPUT (Monitoring Only)
9 NO SWITCH

- Notes:
- No numbered modification code indicates both heads oriented to side (Duplex Head).
 - Standard Conduit openings are left, center, and right with two conduit plugs furnished.
 - Leave the INDICATOR – PILOT LIGHT CODE blank if a pilot light is not required.
 - Leave the HEAD ORIENTATION NUMBERED MODIFICATION CODE blank if not required. Do not enter zero.

EXAMPLE CATALOG LISTING

Catalog Listing	Description
2CLSB1B1-3	Duplex Head Cable Limit Switch, Blue Body – 1/2 NPT, 1NO – 1NC Direct Acting, Momentary – Both Sides, 1NO – 1NC Direct Acting, No Pilot Light, Left Head Front – Right Head Side

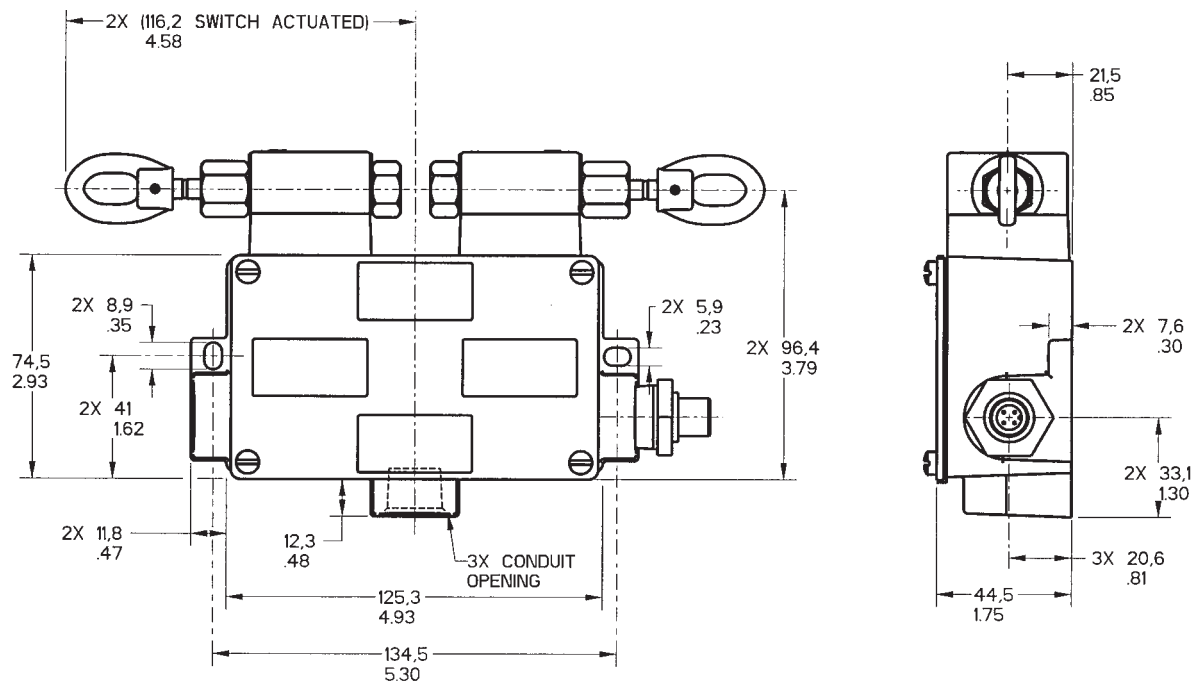
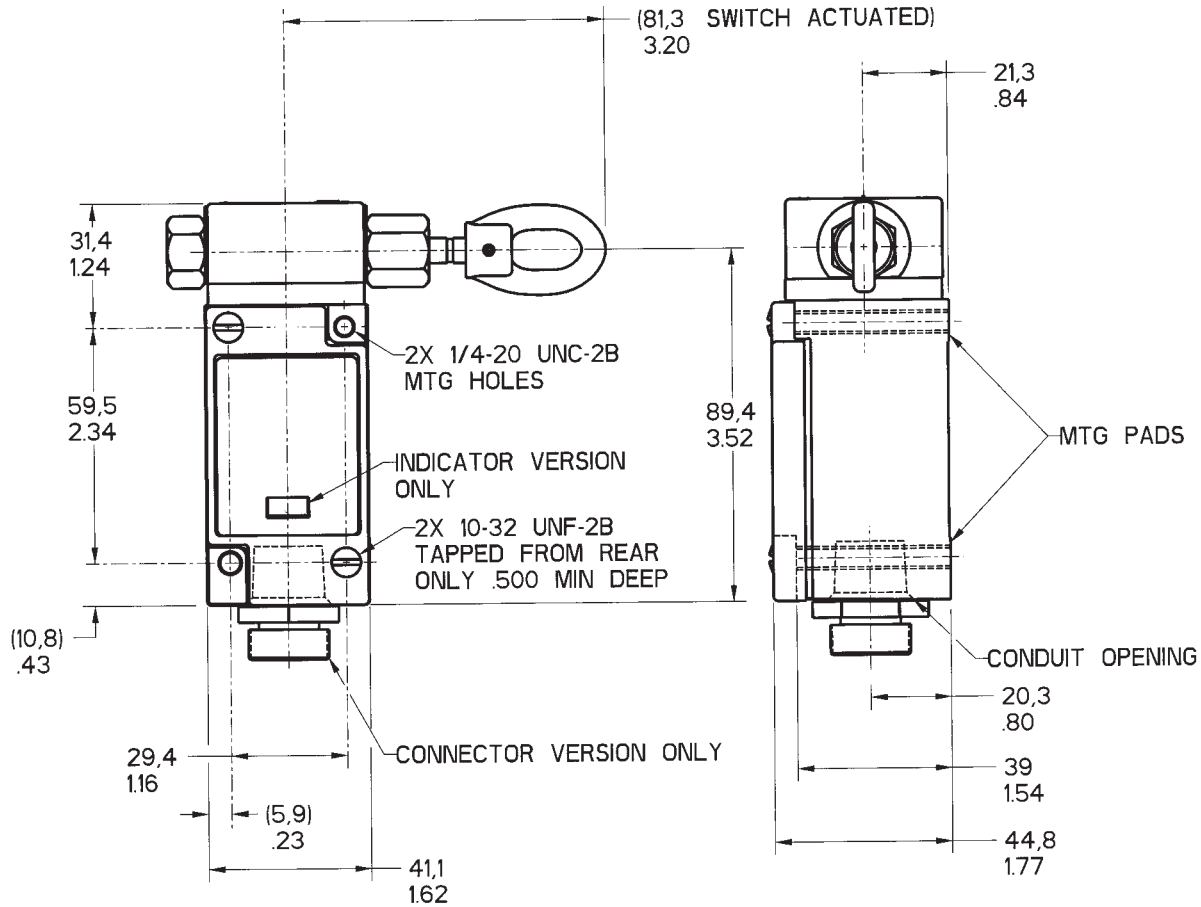
HEAD ORIENTATION NUMBERED MOD CODES		
MOD CODE	LEFT HEAD	RIGHT HEAD
1	FRONT	FRONT
2	FRONT	REAR
3	FRONT	SIDE
4	REAR	FRONT
5	REAR	REAR
6	REAR	SIDE
7	SIDE	FRONT
8	SIDE	REAR

Limit/Enclosed

Momentary Cable Pull Limit Switches: For Signaling Applications

MOUNTING DIMENSIONS

(For reference only)



Limit and Enclosed Switches

CLS Series

Momentary Cable Pull Limit Switches: For Signaling Applications



- INSTALLATION HARDWARE**
- Aircraft cable precut to 25, 50, 100, 150 and 200 feet lengths
 - Lockout attachment
 - End springs for long cable spans to compensate for temperature variations
 - Installation hardware kit supports cable installations of 25 ft. and 50 ft.

INSTALLATION HARDWARE ORDER GUIDE

Catalog Listings	Description
CLSZC1	25 ft. Red Aircraft Cable, finished cable dia. 0.187 in
CLSZC2	50 ft. Red Aircraft Cable, finished cable dia. 0.187 in
CLSZC3	100 ft. Red Aircraft Cable, finished cable dia. 0.187 in
CLSZC4	150 ft. Red Aircraft Cable, finished cable dia. 0.187 in
CLSZC5	200 ft. Red Aircraft Cable, finished cable dia. 0.187 in
CLSZ1S	End Spring
CLSZ00	Installation Kit includes: 4 thimbles, 8 wire rope clamps, 1 turnbuckle (w/lock nuts), 9 eyebolts (w/hardware), 1 endspring, 1 conduit fitting

Notes:
1. Eyebolts should be spaced 1.8 to 2.4 m (6 to 8 ft.) apart.
2. One used for each 7.5 m (25 ft.) of cable span.

Limit/Enclosed

Limit and Enclosed Switches

LS/200LS Series

Compact Limit Switches

FEATURES

- Mode of operation is field adjustable.
- NEMA 1, 3, 4, 6 and 13.
- Wide choice of heads and actuators.
- Variety of operating characteristics.
- Optional indicator light.
- Captive screws.
- UL Recognized, file #E12252
- CSA Certified, file #LR57325

FIELD ADJUSTABLE

Rotary motion roller lever and rod actuators are adjustable through 360°. They may be set for operation clockwise, counter-clockwise, or in both directions.

Operating heads may be positioned in any of four 90° positions.

UL/CSA LS SWITCHES

Several UL recognized and CSA certified LS compact limit switches are in the order guides.

Other listings can be furnished in the UL version. Contact the 800 number for information.

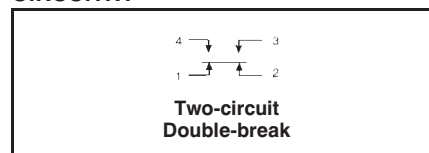
For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

Compact LS and plug-in 200LS limit switches have a long record of successful performance in industrial applications.

The LS fits in many places too small for any other fully adjustable limit switch.

The 200LS switches are the original plug-in concept for reducing downtime by making changeover simple and fast.

CIRCUITRY



**Two-circuit
Double-break**

ELECTRICAL RATINGS

A	10 amps, 120, 240 or 480 VAC; 1/3 hp, 120 VAC; 3/4 hp, 240 VAC; 0.8 amp, 115 VDC**; 0.4 amp, 230 VDC**; 0.1 amp, 550 VDC**; Pilot Duty, 600 VAC max.	APPLICATION NOTE: Silver Cadmium Oxide Contacts – Designed for use with inductive loads such as relays, contactors, motors and solenoids. Honeywell MICRO SWITCH does <i>not</i> recommend the use of silver cadmium oxide switch contacts in non- arcing loads. Non-arcing loads are gen- erally loads less than 12 volts and/or 0.5 amp.
B	10 amps, 120, 240 or 480 VAC; 1/4 hp, 120 VAC; 1/2 hp, 240 VAC. Pilot Duty, 600 VAC max.	
C	10 amps, 120 VAC; 1/3 hp, 120 VAC.	
D	10 amps, 120, 240, 480 VAC; 1/4 hp, 120 VAC; 1/2 hp, 240 VAC; 0.8 amp, 115 VDC**; 0.4 amp, 230 VDC**; 0.1 amp, 550 VDC**; Pilot Duty, 600 VAC max.	
E	10 amps, 120, 240 or 480 VAC; 1/3 hp, 120 VAC; 3/4 hp, 240 VAC. Pilot Duty, 600 VAC max.	Fine Silver Contacts
F	UL Rating: 10 amps, 125, 250, or 480 VAC; 1/3 hp, 125 VAC; 3/4 hp, 250 VAC; 0.8 amp, 125 VDC**; 0.4 amp, 250 VDC**	
G	UL Rating: 10 amps, 125, 250 or 480 VAC; 1/4 hp, 125 VAC; 1/2 hp, 250 VAC; 0.8 amp, 125 VDC**; 0.4 amp, 250 VDC**	

** Resistive Rating

NOTE: The terminals of two-circuit double-break switches must be wired to equal voltage sources and the same polarity. The loads should be on the same side of the line.

ROLLER LEVER ROTARY ACTUATED SWITCHES

(To order switches and levers separately, refer to pages A73 and A74 or A37 and A38.)

ORDER GUIDE

Momentary action. Steel rollers.



Compact



Plug-in*

Description	Rating	Catalog Listing Compact	Catalog Listing Plug-in	O.F. max.	P.T. max.	O.T. min.	D.T. max.
Standard	A	1LS1	201LS1*	13,3 N 3 lb.	20°	30°	12°
20° Pretravel UL/CSA	F	1LS1-L	—	13,3 N 3 lb.	20°	30°	12°
Low Pretravel 5°	B	1LS19	201LS19*	13,3 N 3 lb.	5°	30°	4°
Low Operating Force 5° Pretravel	B	1LS131	—	5,0 N 18 oz.	5°	30°	4°
Standard with indicator light 120 VAC only	C	1LS501	201LS501*	13,3 N 3 lb.	20°	30°	12°
Low Operating Force	A	1LS6	201LS6*	5,0 N 18 oz.	20°	30°	12°
Cavity Mount version of 1LS1	A	7LS1	—	13,3 N 3 lb.	20°	30°	12°

*Require Terminal Block (**18PA1** for 200LS switches) which must be ordered separately. Unless damaged, it is not necessary to replace terminal block when replacing switch.

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel.

Compact Limit Switches

MAINTAINED CONTACT YOKE ROLLER LEVER ROTARY ACTUATED SWITCHES



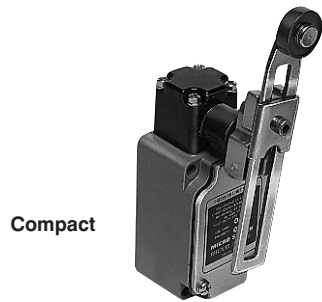
Compact

ORDER GUIDE

Maintained contact

Description	Electrical Rating Page A70	Catalog Listing		O.F. max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in				
Steel rollers on opposite sides of arm	A	6LS1	206LS1*	8,9 N 2 lb.	55°	35°	20°
Nylon rollers on same side of arm	A	6LS3	—	8,9 N 2 lb.	55°	35°	20°

ADJUSTABLE LENGTH ROLLER LEVER ROTARY ACTUATED SWITCHES



Compact

ORDER GUIDE

Length adjustable 1.2 to 3.5 in. (30.6 to 88.9 mm)

Momentary action. Nylon rollers.

Description	Electrical Rating Page A70	Catalog Listing		O.F.† max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in				
Standard Pretravel 20° UL/CSA	A	1LS3	201LS3*	13,3 N 3 lb.	20°	30°	12°
	F	1LS3-L	—				
Low pretravel 5°	B	1LS58	—	13,3 N 3 lb.	5°	30°	4°
Low pretravel 5° and low operating force	B	1LS59	—	5,0 N 18 oz.	5°	30°	4°

†at 1.5" length

LOW FORCE ROD ROTARY ACTUATED SWITCHES



Compact

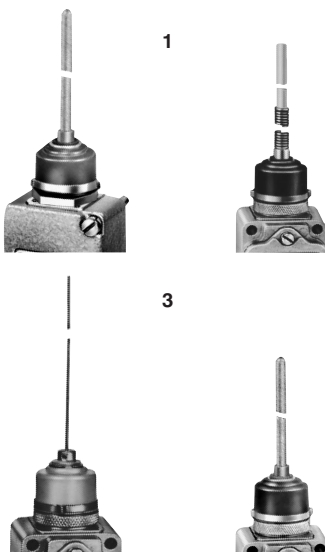
ORDER GUIDE

Momentary action, 5-inch (127mm) aluminum rod.

Description	Electrical Rating Page A70	Catalog Listing		O.F.** max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in				
Standard Pretravel 20° UL/CSA	A	1LS10	201LS10*	1,39 N 5 oz.	20°	30°	12°
	F	1LS10-L	—				
Low pretravel 5°	B	1LS47	201LS47*	1,39 N 5 oz.	5°	30°	4°
Low pretravel 5° and low operating force	B	1LS53	201LS51*	0,83 N 3 oz.	5°	30°	4°

**Rod fully extended

WOBBLE LEVER ACTUATED SWITCHES



1

2

3

4

ORDER GUIDE

Momentary action.

Description	Electrical Rating Page A70	Catalog Listing		O.F. max.	P.T. max.
		Compact	Plug-in		
Flexible cable actuator ¹ UL/CSA	D	8LS1	208LS1*	1,39 N 5 oz.	28,6 1.125
	G	8LS1-L	—	1,39 N 5 oz.	28,6 1.125
Combination spring-rod ²	D	8LS3	208LS3*	1,39 N 5 oz.	28,6 1.125
Low force steel wire ³	D	8LS125	208LS125*	0,28 N 1 oz.	63,5 2.5
Coil spring ⁴ Stainless steel	D	8LS152	208LS152*	1,39 N 5 oz.	28,6 1.125

*Require Terminal Block (18PA1 for 200LS Switches) which must be ordered separately. Unless damaged, it is not necessary to replace terminal block when replacing switch.

Limit/Enclosed

Compact Limit Switches
TOP PLUNGER ACTUATED SWITCHES

Compact



ORDER GUIDE
Momentary action.

Description	Electrical Rating Page A70	Catalog Listing		O.F. max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in	N lb.	mm in.	mm in.	mm in.
Standard top plunger	A	2LS1	202LS1*	31,17	1,65.065	6,35.250	0,51.020
UL/CSA	F	2LS1-L	—	31,17	1,65.065	6,35.250	0,51.020
Low operating force top plunger	E	2LS111	202LS111*	1036 oz.	1,65.065	5,56.219	0,23.009

TOP ROLLER PLUNGER ACTUATED SWITCHES

Plug-in*



ORDER GUIDE
Momentary action.

Description	Electrical Rating Page A70	Catalog Listing		O.F. max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in	N lb.	mm in.	mm in.	mm in.
Standard top roller Plunger	A	5LS1	205LS1*	31,17	1,65.065	5,56.219	0,51.020
Steel roller UL/CSA	F	5LS1-L	—	31,17	1,65.065	5,56.219	0,51.020

SIDE PLUNGER ACTUATED SWITCHES

Compact



ORDER GUIDE
Momentary action. Assembled with plunger facing front (label side).

Description	Electrical Rating Page A70	Catalog Listing		O.F. max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in	N lb.	mm in.	mm in.	mm in.
Standard side roller	A	4LS1	204LS1*	409	2,77.109	6,35.250	1,02.040

SIDE ROLLER PLUNGER ACTUATED SWITCHES

Plug-in*



ORDER GUIDE
Momentary action. Assembled with plunger facing front (label side).

Description	Electrical Rating Page A70	Catalog Listing		O.F. max.	P.T. max.	O.T. min.	D.T. max.
		Compact	Plug-in	N lb.	mm in.	mm in.	mm in.
Standard side roller plunger Steel Roller	A	3LS1	203LS1*	409	2,77.109	5,56.219	1,02.040

* Require Terminal Block (18PA1 for 200LS Switches) which must be ordered separately. Unless damaged, it is not necessary to replace terminal block when replacing switch.

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel.

N = Newton

Compact Limit Switches

ROTARY ACTUATED SWITCHES — WITHOUT LEVERS

The following compact LS and plug-in 200LS limit switches are sold without actuating levers. Levers are ordered separately from the order guide below and on the facing page.

Plug-in*



Compact



ORDER GUIDE

Momentary action, except where noted.

Description	Electrical Rating Page A70	Catalog Compact	Catalog Listing Plug-in	O.Tq. max.	P.T. max.	O.T. min.	D.T. max.
Standard 20° pretravel	A	1LS2	201LS2*	0,51 Nm 4.5 in. lb.	20°	30°	12°
UL/CSA	F	1LS2-L	—	0,51 Nm 4.5 in. lb.	20°	30°	12°
Low pretravel 5°	B	1LS9	201LS9*	0,51 Nm 4.5 in. lb.	5°	30°	4°
Standard pretravel 20° Low operating force	A	1LS23	201LS23*	0,21 Nm 30 in. oz.	20°	30°	12°
Low pretravel 5° Low operating force	B	1LS56	201LS56*	0,11 Nm 15 in. oz.	5°	30°	4°
Maintained ¹ Contact	A	6LS2	206LS2*	0,34 Nm 3 in. lb.	55°	35°	20°
UL/CSA	F	6LS2-L	—	0,34 Nm 3 in. lb.	55°	35°	20°

* Require Terminal Block (18PA1 for 200LS Switches).
Note 1 — Yoke lever actuators normally used.

Characteristics:
O.Tq. — Operating Torque; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

Limit/Enclosed

AUXILIARY ROTARY LEVERS

ORDER GUIDE

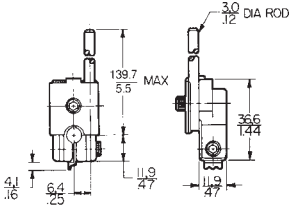
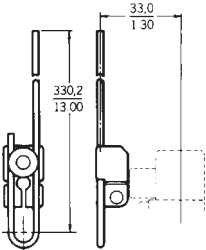
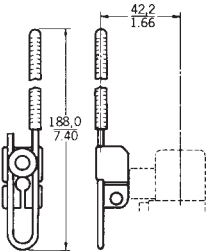
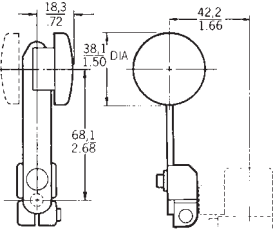
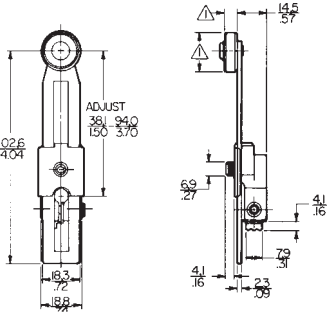
	Type	Catalog Listing
	Roller arm, with nylon, steel, or ball bearing roller.	Nylon 6PA71
		Steel 6PA121
		Ball bearing 6PA144
	Yoke roller lever with nylon or steel rollers. Rollers on same side.	Steel 6PA80
		Steel 6PA82
		Nylon 6PA102

60mm radius levers Part # PA-J11

Compact Limit Switches

AUXILIARY ROTARY LEVERS

ORDER GUIDE

	Type	Catalog Listing
	Adjustable aluminum rod.	LSZ54M
	Adjustable stainless steel rod.	6PA63
	Adjustable spring rod.	6PA69
	Hand operated aluminum button on stainless steel lever.	6PA57
	Adjustable roller arm with steel or nylon rollers. .75 dia. roller	SteelLSZ52D
	.75 dia. roller	NylonLSZ52C
	1.00 dia. roller	NylonLSZ52J
	1.50 dia. roller	NylonLSZ52K
	2.00 dia. lever	NylonLSZ52M

Limit and Enclosed Switches

Replacement Parts

LS/200LS Series

REPLACEMENT PARTS

Except where noted, all operating heads are furnished with actuators.

Catalog Listing	Contact Block		Operating Head	Actuator Only
	Compact	Plug-In		
1LS1-L	2MN1-L	2MN6	9PA15	6PA121
1LS1 201LS1	2MN1			
1LS2-L	2MN1-L	2MN6	9PA16†	Note 1
1LS2 201LS2	2MN1			
1LS3-L	2MN1-L	2MN6	9PA16†	LSZ52C
1LS3 201LS3	2MN1			
1LS6 201LS6	2MN1	2MN6	9PA50	6PA121
1LS9 201LS9	2MN8	2MN13	9PA16†	Note 1
1LS10-L	2MN1-L	2MN6	9PA40	6PA43
1LS10 201LS10	2MN1			
1LS19 201LS19	2MN8	2MN13	9PA15	6PA121
1LS23 201LS23	2MN1	2MN6	9PA68†	Note 2
1LS47 201LS47	2MN8	2MN13	9PA40	6PA43
1LS53 201LS51	2MN8	2MN13	9PA48	6PA43
1LS56 201LS56	2MN8	2MN13	9PA74†	Note 2
1LS58	2MN8	—	9PA16†	LSZ52C
1LS131	2MN8	—	9PA50	6PA121
1LS501 201LS501	2MN1	2MN14	9PA15	6PA121

†Furnished without actuator.
Note 1—Any auxiliary actuator shown can be used with these listings.
Note 2—6PA43, 6PA63, 6PA71 or 6PA121 auxiliary actuators only are recommended for these listings.
Note 3—Yoke lever actuators normally used.

CONDUIT SEALING PACKETS

Packet	Cable O.D. Inches
2PA6	.400"—.435"
2PA16	.435"—.470"
2PA1	.530"—.570"

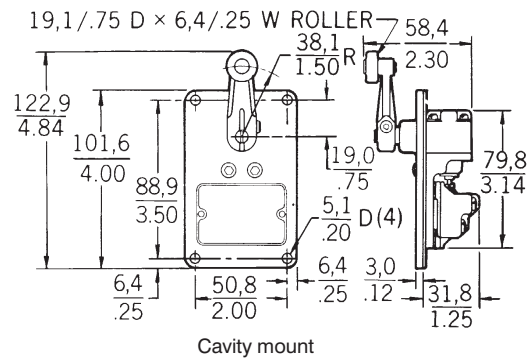
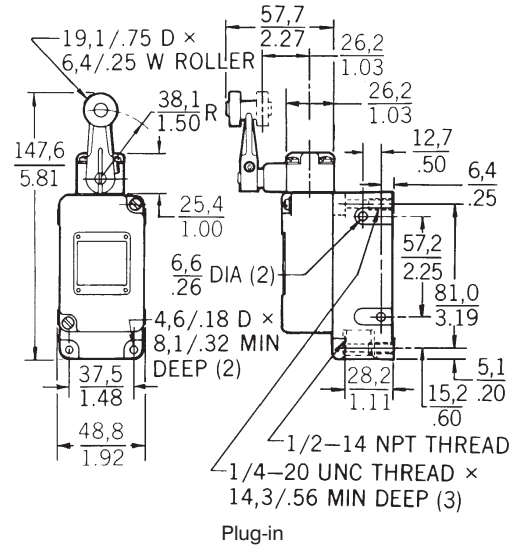
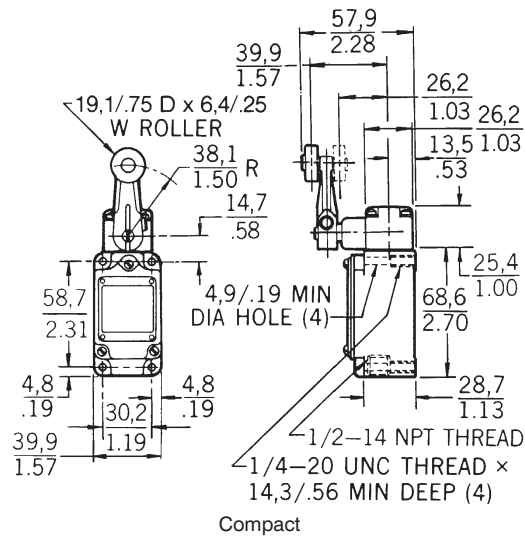
(See page A49 for description)

Catalog Listing	Contact Block		Operating Head	Actuator Only
	Compact	Plug-In		
2LS1-L	2MN1-L	2MN6	9PA32	None
2LS1 202LS1	2MN1			
2LS111 202LS111	2MN3	2MN7	9PA71	None
3LS1 203LS1	2MN11	2MN9	9PA45	None
4LS1 204LS1	2MN11	2MN9	9PA44	None
5LS1-L	2MN1-L	2MN6	9PA33	None
5LS1 205LS1	2MN1			
6LS1 206LS1	2MN1	2MN6	9PA46	6PA80
6LS2-L	2MN1-L	2MN6	9PA47†	Note 3
6LS2 206LS2	2MN1			
6LS3	2MN1	—	9PA47†	6PA102
7LS1	2MN1	—	9PA15	6PA121
8LS1-L	2MN11-L	2MN9	9PA58	None
8LS1 208LS1	2MN11			
8LS3 208LS3	2MN1	2MN6	9PA49	None
8LS125 208LS125	2MN11	2MN9	9PA54	None
8LS152 208LS152	2MN1	2MN6	9PA42	None

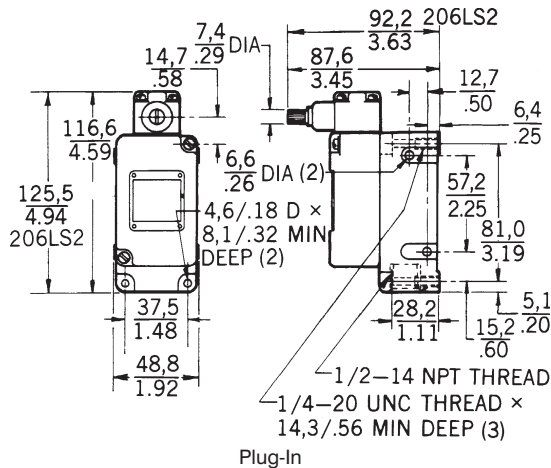
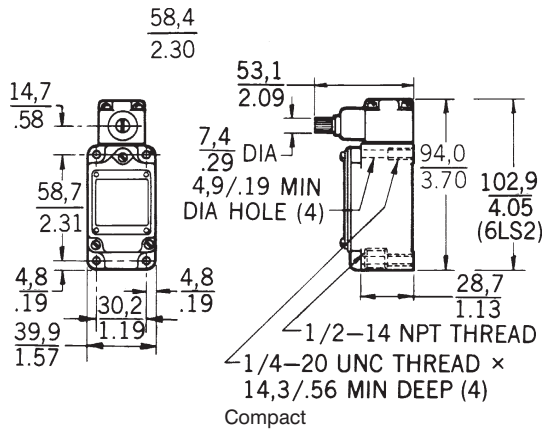
Limit/Enclosed

Mounting Dimensions (For reference only)

ROLLER LEVER

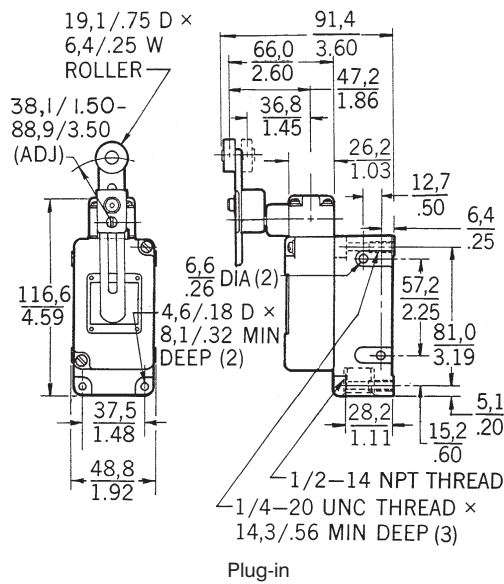
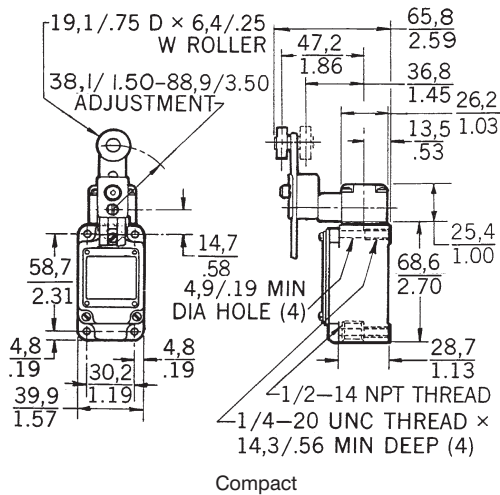


SWITCH WITHOUT LEVER

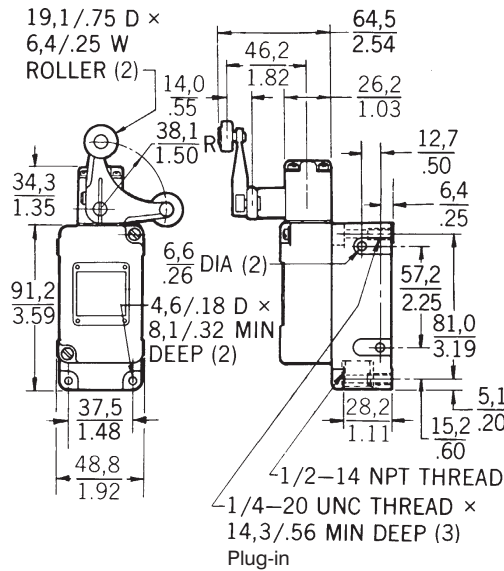
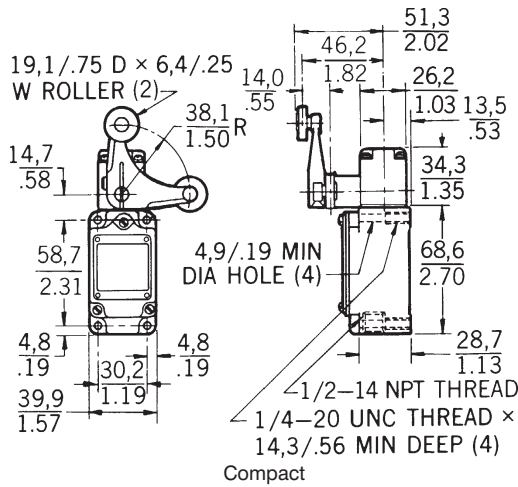


Mounting Dimensions (For reference only)

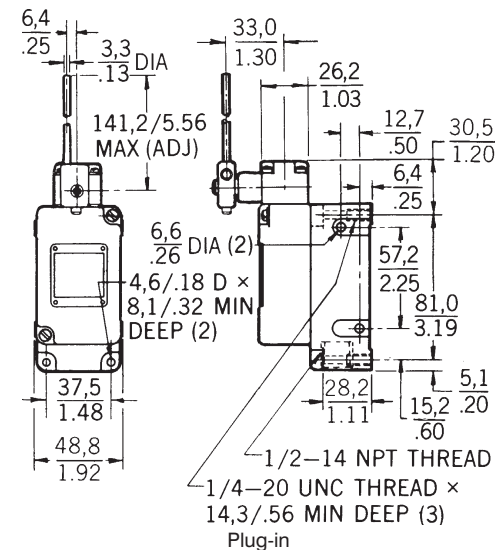
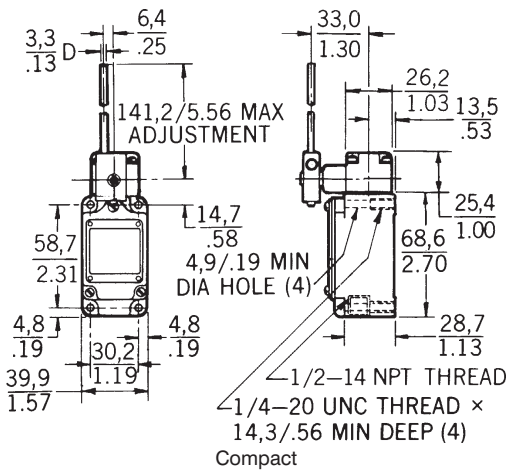
ADJUSTABLE LENGTH ROLLER LEVER



YOKE ROLLER LEVER



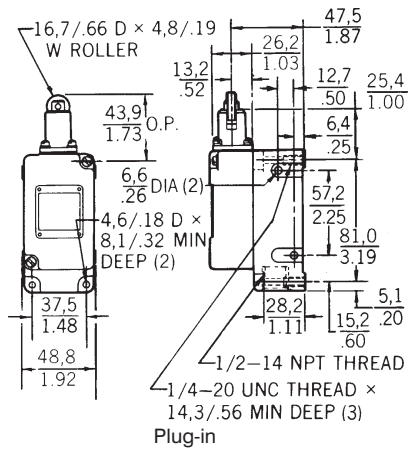
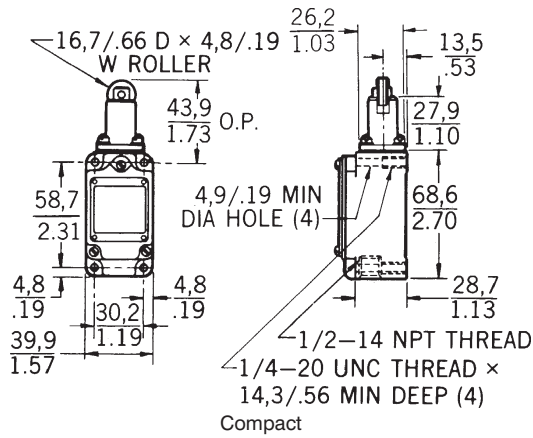
ADJUSTABLE LENGTH ROD



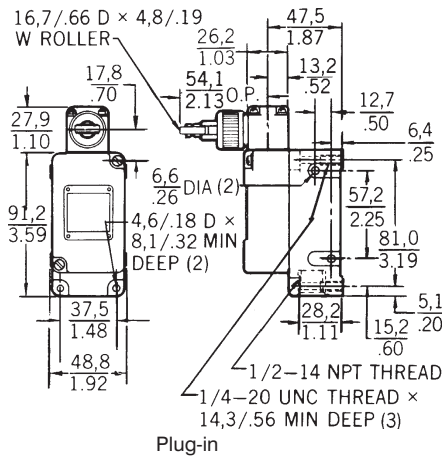
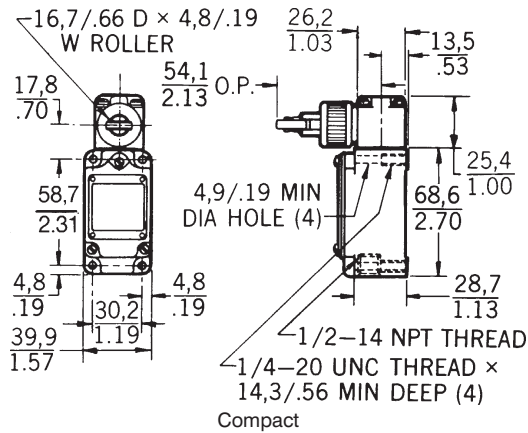
Limit/Enclosed

Mounting Dimensions (For reference only)

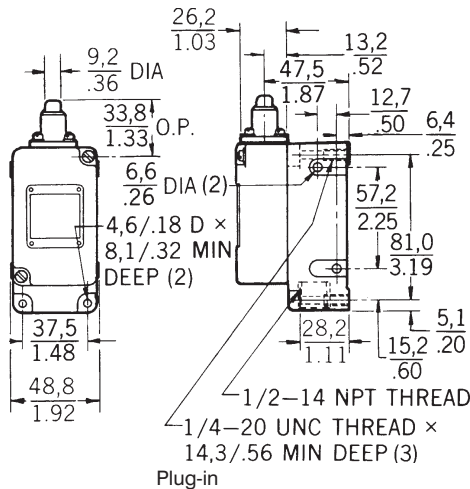
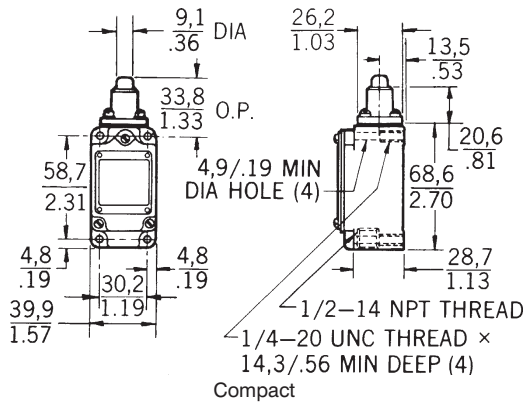
TOP ROLLER PLUNGER



SIDE ROLLER PLUNGER



TOP PLUNGER



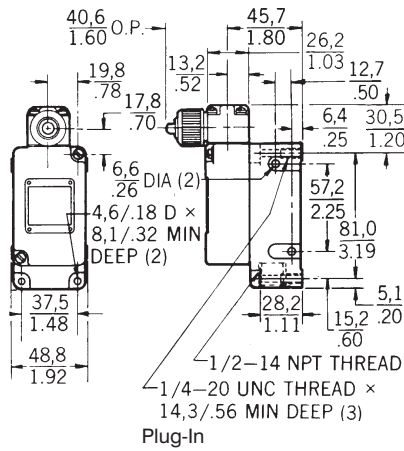
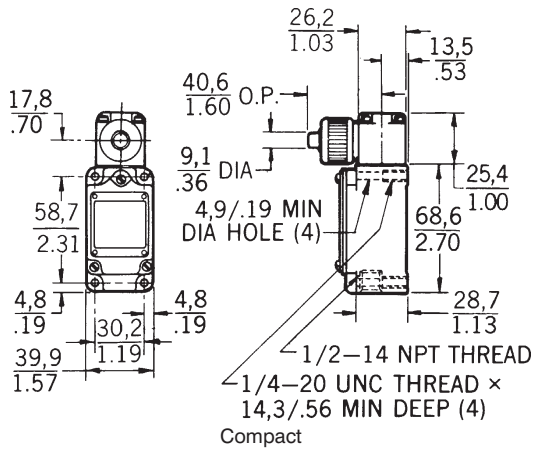
Key: 0,0 = mm
0.00 = inches

Limit and Enclosed Switches

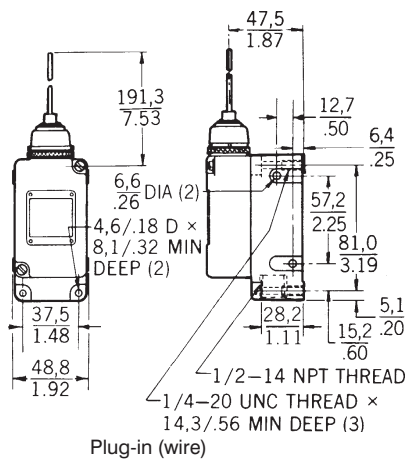
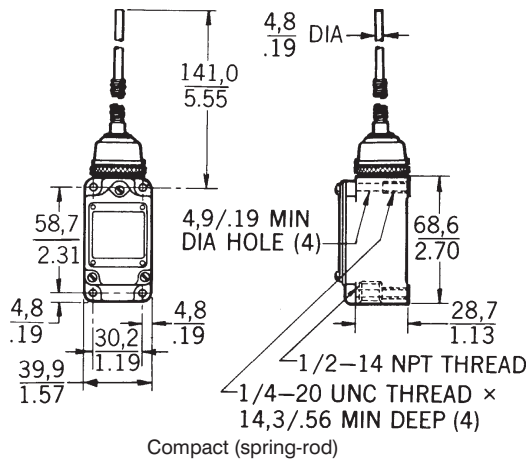
LS/200LS Series

Mounting Dimensions (For reference only)

SIDE PLUNGER



WOBBLE LEVER



Key: 0,0 = mm
0.00 = inches

Limit/Enclosed

Limit and Enclosed Switches

International Compact Limit Switches

LS Series



FEATURES

- Ideal source of replacement parts for imported machine tools or transplant factories.
- Made in Honeywell factories in Europe and Japan.
- Mode of operation is field adjustable
- NEMA 1, 3, 3R, 4, 6, 12, and 13
- Optional indicator light with Neon lamp or LED
- Rugged cast aluminum housing
- Temperature range -20° to 70°C (-2° to 158°F)
- Gold plated contacts available

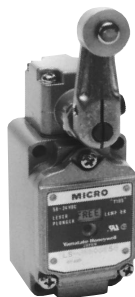
CIRCUITRY

<p>Two-Circuit Double-Break</p>	<p>10A – 125, 250, 480 VAC 0.8A – 125 VDC, 0.4A – 250 VDC ½ HP – 125 VDC, 1 HP – 250 VAC</p>
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INTERNATIONAL LISTINGS ORDER GUIDE

Description	Honeywell Europe	Yamatake	O.F. max.	P.T. max.	O.T. max.	D.T. max.
Standard	ILS1-4PG	ILS1-J	1360g	20°	30°	12°
Low Pretravel	ILS19-4PG	ILS19-J	1360g	7°	30°	3°

HIGH OVERTRAVEL SWITCH WITH ACTUATOR



Characteristics: O.F. – Operating Force; P.T. – Pretravel;
O.T. – Overtravel; D.T. – Differential Travel

ORDER GUIDE

Description	Catalog Listing	O.F. max.	P.T. max.	O.T. min.	D.T. max.
High Overtravel	1LS-J50	3.43 kg-cm	30°	60°	15°
High Overtravel	1LS-J500	3.43 kg-cm	20°	55°	12°
High Overtravel Low Pretravel	1LS-J550	3.43 kg-cm	10°	62°	5°

TOP BALL PLUNGER



ORDER GUIDE

Description	Catalog Listing	O.F. max.	P.T. max.	O.T. min.	D.T. max.
Top Ball Plunger	2LS-J6	2,720 g	1.7mm	4.0mm	0.15mm
Replacement Head	9PA-J66				
Contact Block	2MN11-J				

OPTIONAL INDICATOR

Limit switch cover with indicator module can be ordered separately or as a complete switch by adding "E", "EC" or "E5" to catalog listings (ex. 1LS1-JE).



ORDER GUIDE

Voltage	Catalog Listing	Additional Letter for Complete Switch
100/200 VAC Neon	LS-29PA1	E ex. 1LS1-JE
24 VAC/DC LED	LS-29PA5	E5 ex. 1LS1-JE5
12 to 125 VAC/DC LED	LS-29PAEC	EC ex. 1LS1-JEC

Note: The lamp module on back of cover can be easily rotated to monitor either the N.O. or the N.C. contacts.

Limit and Enclosed Switches

International Compact Limit Switches

LS Series

- DOUBLE SEAL TYPE**
- Housing unit **and** switching unit are sealed
 - Switching unit plunger has a boot seal, and epoxy-sealed seams



ORDER GUIDE

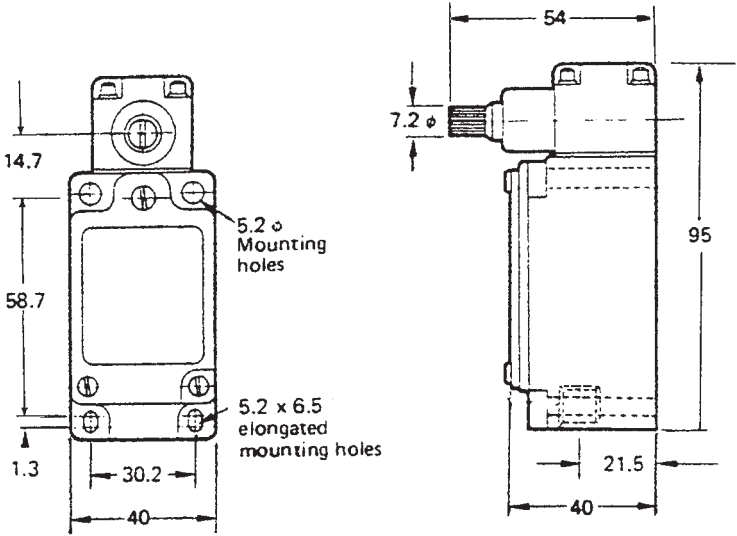
Available Catalog Listing	
1LS1-JS	Standard roller lever - side rotary
1LS19-JS	Low pretravel side rotary roller lever
1LS-J500S	High overtravel side rotary roller lever
1LS-J550S	High overtravel - low pretravel side rotary
5LS1-JS	Top roller plunger

MOUNTING DIMENSIONS
(For reference only)

Key:

0,0 = mm

0.00 = inches



Conduit Thread

“PG” specifies PG 13,5 thread e.g. 1LS1-4PG
“C” specifies 20 mm thread e.g. 1LS1-4C
(Minimum order quantities may be required for optional conduit threads.)

Limit/Enclosed

Limit and Enclosed Switches

LD Series

Multiple Plunger Limit Switches



FEATURES

- Ideal source of replacement parts for imported machine tools or transplant factories
- Up to 15A capacity
- Variety of switch units
- Roller and chisel plunger are available
- Operating points are precisely factory-adjusted
- Easy mounting and wiring
- NEMA 6, 13 and IEC IP 67 sealing
- Temperature range -10 to +70°C (+14 to +158°F)

One LD series multi-plunger limit switch can replace several individual switches in many machine tooling applications, and on welding and transfer machines in automobile plants.

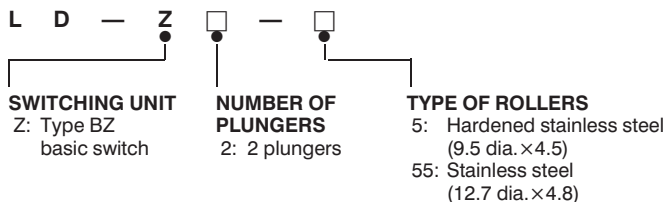
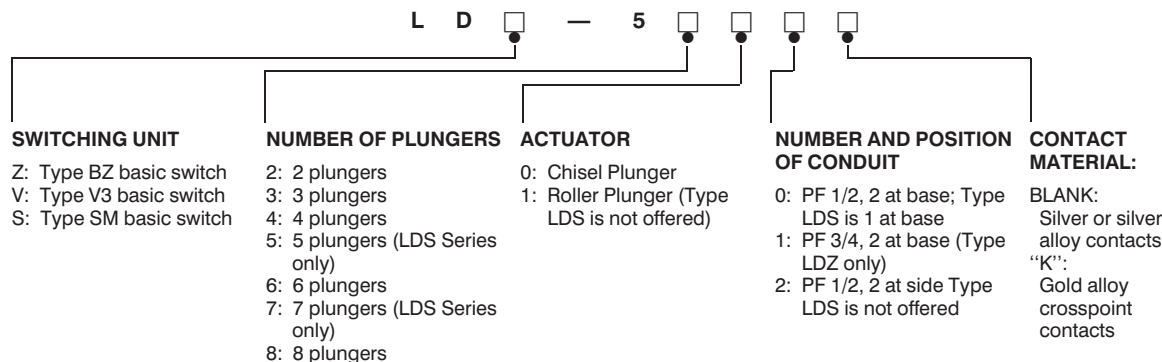
Numerous conduit arrangements are possible, making switch wiring and maintenance simple and inexpensive.

	Catalog Listing	LDS-5000K Series	LDV-5000 Series	LDZ-5000 Series	LD-Z Series
Electrical Specifications	Max. current at max. voltage ratings	5A at 125, 250VAC K series; 0.1A at 125VAC 0.1A at 30VDC	10A at 125, 250VAC 0.5A at 125VDC 0.25A at 250VDC	15A at 125, 250, 480VAC 0.5A at 125VDC 0.25A at 250VDC	15A at 125, 250, 480VAC 0.5A at 125VDC 0.25A at 250VDC
Single Pole Double Throw	Circuitry	SPDT	SPDT	SPDT	SPDT
Operating Characteristics	Plunger Number	2,3,4,5,6,7,8	2,3,4,6,8	2,3,4,6,8,10,12	2
	Pitch	8 ± 0.15mm	12 ± 0.2mm	19 ± 0.2mm	18 ± 0.25mm
	Type	Chisel-shaped	Chisel-shaped roller	Chisel-shaped roller	Roller
	O.F. max. – N/lb.	10/2.2	14.74/3.3	19.75/4.4	14.74/3.3
	P.T. max. – mm/in.	1.5/0.06	1.5/0.06	1.5/0.06	1.5/0.06
	O.T. min. – mm/in.	2/0.99	3/0.12	3/0.12	3/0.12
	D.T. – mm/in.	0.2/0.008 max.	0.1–0.32 0.004–0.013	0.01–0.05 0.0005–0.002	0.01–0.05 0.0005–0.002

Characteristics: O.F.—Operating Force; P.T.—Pretravel; O.T.—Overtravel; D.T.—Differential Travel; N—Newtons

ORDER GUIDE

(For identification of existing listings only. Not for generating new listings.)



REPLACEMENT SWITCH UNITS

Switches	Replacement
LDS-5000	AS-J212
LDS-5000K	AS-J212K
LDZ-5000	AS-J209
LDZ-5000K	AS-J209K
LDV-5000	AS-J215
LDV-5000K	AS-J215K
REPLACEMENT HEADS – LDZ ONLY	
Bevel	9PA-J68
Roller	9PA-J67

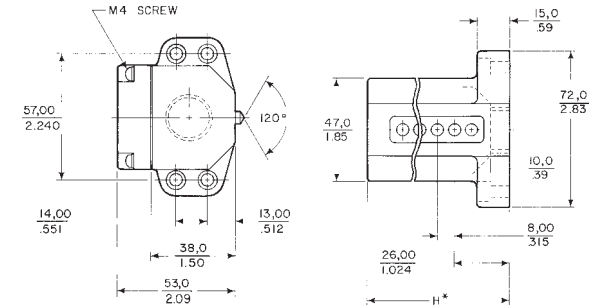
Limit and Enclosed Switches

LD Series

Multiple Plunger Limit Switches

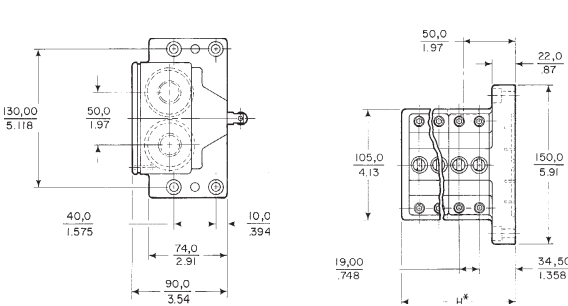
MOUNTING DIMENSIONS 0.0 mm / 0.00 inches
(For reference only)

LDS-5000 and LDS-5000K



*NUMBER OF PLUNGERS	2	4	6	8
DIMENSION "H"	50 mm	66 mm	82 mm	98 mm

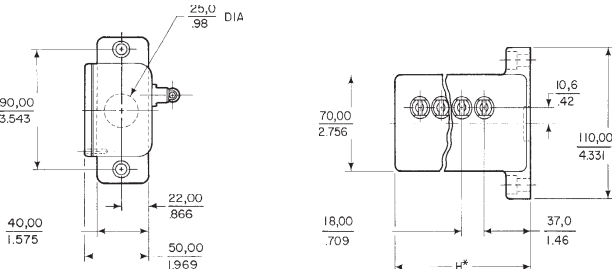
LDZ-5000



*NUMBER OF PLUNGERS	2	4	6	8
DIMENSION "H"	70 mm	108 mm	146 mm	184 mm

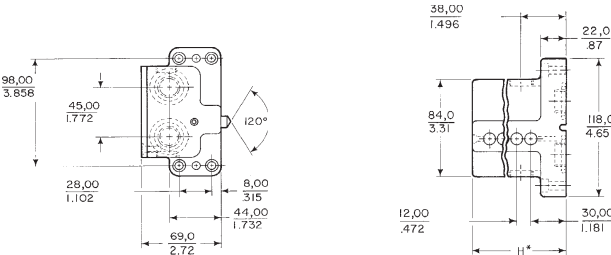
Limit/Enclosed

LD-Z



*NUMBER OF PLUNGERS	2	4	6
DIMENSION "H"	75 mm	110 mm	145 mm

LDV-5000



*NUMBER OF PLUNGERS	2	3	4	6
DIMENSION "H"	58 mm	70 mm	82 mm	106 mm

Limit and Enclosed Switches
Compact Limit Switches

SL1 Series



FEATURES


- Ideal source of replacement parts for imported machine tools or transplant factories
- NEMA 3,4, 13 and IEC IP 67 sealing
- Smaller size saves space
- Rugged Zinc diecast housing
- Wide product selection to suit many applications
- Snap-in terminal enclosure makes mounting and wiring easy
- Temperature ranges: Standard -10 to +70°C (14 to 158°F); Low temp. with roller lever -40 to +70°C (-40 to 158°F); Low temp. with roller plunger -50 to 70°C (-60 to +158°F)

SL1 series compact limit switches are sealed, sensitive, and have a long life. The compact size makes them suitable for the total miniaturization of machinery or equipment.

Versions are available with: gold-clad cross-point contacts, prewiring, lamp indications, seal boots with roller plungers, and a variety of actuating possibilities.

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

CIRCUITRY AND ELECTRICAL RATING

 Single-Pole Double-Throw	Listing	Rating	Contact
	SL1-□	5A-125, 250VAC	Silver
	SL1-□ K	0.1A-125VAC 0.1A-30VDC	Gold Clad Cross Point

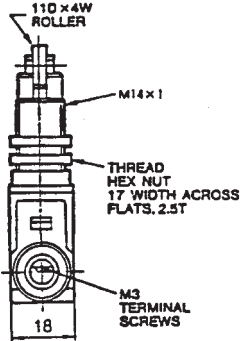
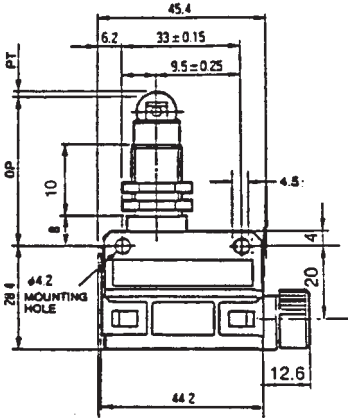
Note: Conduit will seal to cable diameters from 5.8mm to 9.6mm.

ORDER GUIDE AND MOUNTING DIMENSIONS
UL/CSA listings available by adding "2" to catalog listing.
Example: SL1-A2

UL Recognized, file #E37559
CSA Certified, file #LR61344, LR21098, LR47132, LR61643

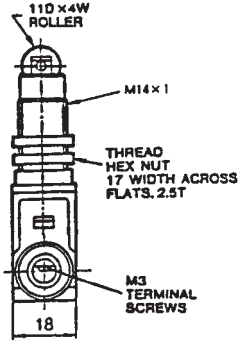
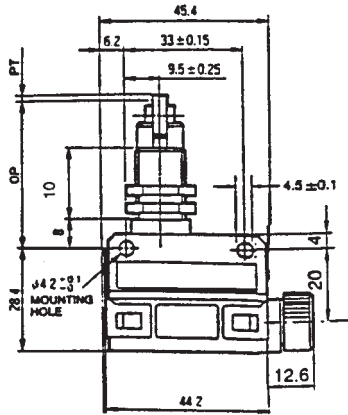
ROLLER PLUNGER

Catalog Listing	SL1-A
	SL1-AK
O.F. (max.)	1,200 g
R.F. (min.)	500 g
P.T. (max.)	1.5 mm
O.T. (min.)	3 mm
D.T. (max.)	0.1 mm
O.P.	31.4 mm



CROSS ROLLER PLUNGER

Catalog Listing	SL1-D
	SL1-DK
O.F. (max.)	1,200 g
R.F. (min.)	500 g
P.T. (max.)	1.5 mm
O.T. (min.)	3 mm
D.T. (max.)	0.1 mm
O.P.	31.4 mm



Characteristics: O.F. - Operating Force; R.F. - Release Force; P.T. - Pretravel; O.T. - Overtravel; D.T. - Differential Travel; N - Newtons

Limit and Enclosed Switches

Compact Limit Switches

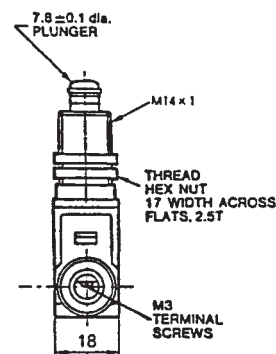
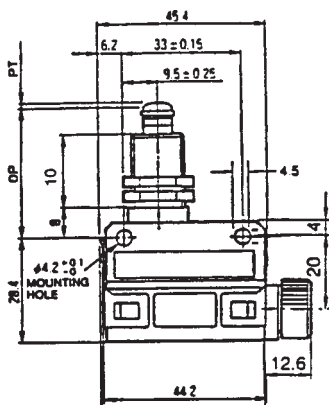
SL1 Series



STRAIGHT PLUNGER

Catalog Listing	SL1-H
	SL1-HK

O.F. (max.)	1,200 g
R.F. (min.)	500 g
P.T. (max.)	1.5 mm
O.T. (min.)	3 mm
D.T. (max.)	0.1 mm
O.P.	25.4 mm



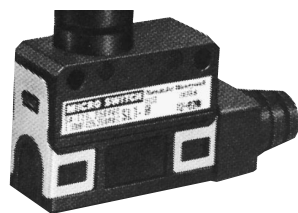
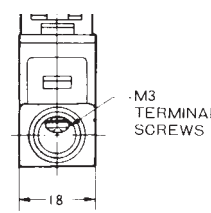
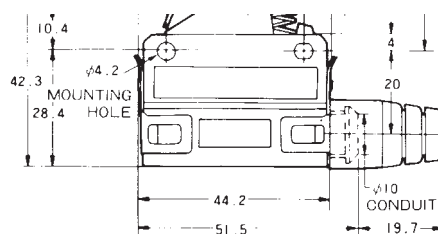
Limit/Enclosed



ROLLER LEVER

Catalog Listing	SL1-P
	SL1-PK

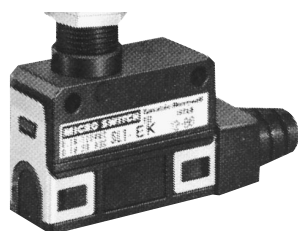
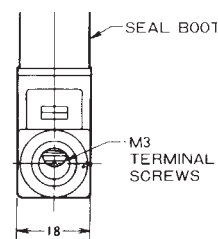
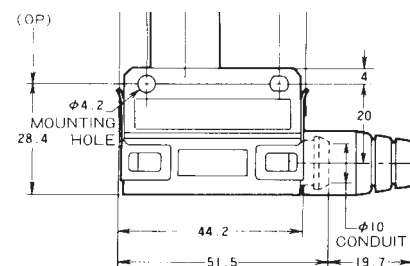
O.F. (max.)	400 g
R.F. (min.)	80 g
P.T. (max.)	2 mm
O.T. (min.)	4 mm
D.T. (max.)	0.3 mm
O.P.	23.1 mm



ROLLER PLUNGER WITH SEAL BOOT

Catalog Listing	SL1-B
	SL1-BK

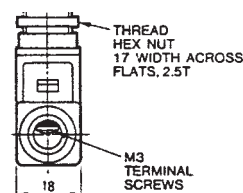
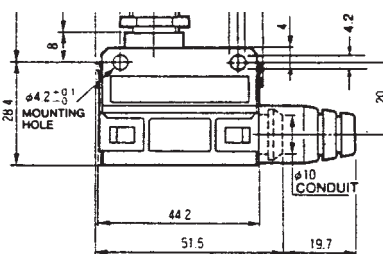
O.F. (max.)	1,200 g
R.F. (min.)	500 g
P.T. (max.)	1.5 mm
O.T. (min.)	3 mm
D.T. (max.)	0.1 mm
O.P.	41.4 mm



LONG ROLLER PLUNGER

Catalog Listing	SL1-E
	SL1-EK

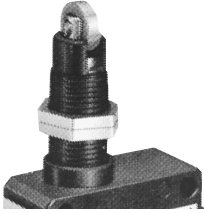
O.F. (max.)	1,200g
R.F. (min.)	500g
P.T. (max.)	1.5 mm
O.T. (min.)	3 mm
D.T. (max.)	0.1 mm
O.P.	41,4 mm



Limit and Enclosed Switches

Compact Limit Switches

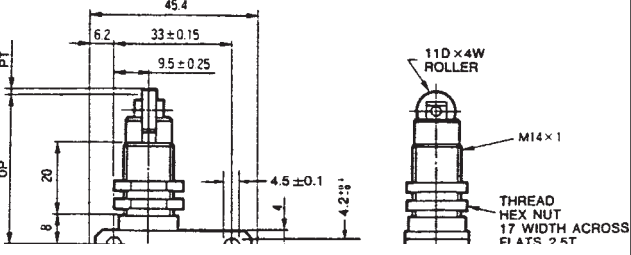
SL1 Series



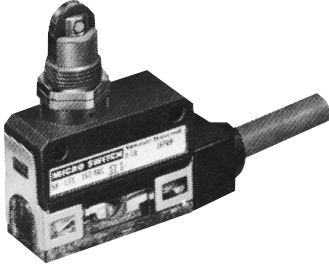
**LONG CROSS ROLLER
PLUNGER**

Catalog Listing	
SL1-K	
SL1-KK	

O.F. (max.)	1,200g
R.F. (min.)	500g
P.T. (max.)	1.5mm
O.T. (min.)	3mm
D.T. (max.)	0.1mm
O.P.	41,4mm



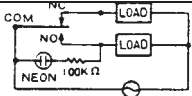
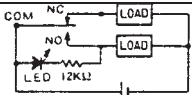
COMPACT LIMIT SWITCHES WITH LAMP INDICATION



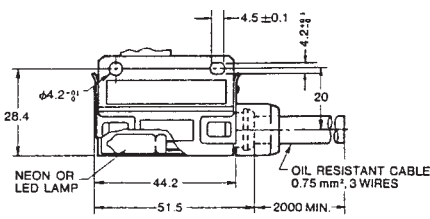
FEATURES

- Available with neon lamp for 100-250 VAC. Available with LED lamp for 24 VDC
- Lamp indication clearly visible from most angles through the rugged transparent nylon enclosure
- Provided with oil resistant vinyl cabtyre cable

ORDER GUIDE

Specification	Catalog Listing	Wiring
<ul style="list-style-type: none">• Neon lamp• 100 to 250 VAC• Silver contact	SL1-□ EXG2	
<ul style="list-style-type: none">• LED lamp• 24 VDC• Gold clad	SL1-□ KFXG2	

MOUNTING DIMENSIONS
(For reference only) Dimensions - mm



General Purpose Compact Limit Switches

VL Series

FEATURES

- Gold plated silver contacts
- Compact design for small mounting space.
- Special design for easy wiring with ample wiring space
- Two-circuit double-break
- Diecast base and plastic cover
- Standard mounting dimensions
- Long mechanical life
- 5Amp current capacity
- Ambient Temp range: -20 to 60 Degrees Celsius [-4 to 140 degrees Fahrenheit]
- C-UL, CE approved

TYPICAL APPLICATIONS

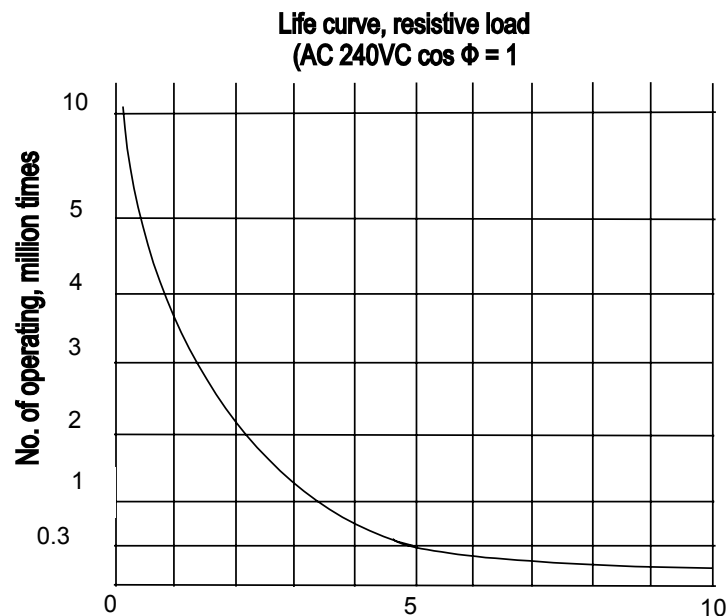
- Machine Tools
- Material Handling
- Food Processing Machinery
- Conveyors
- Packaging Machinery



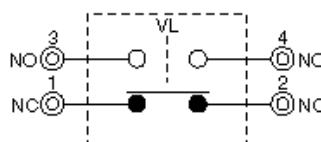
DESCRIPTION

The new economical SZL-VL Series miniature type limit switches are specially designed for applications of small mounting space. These miniature switches are ideal for OEM machinery which requires a rugged and reliable limit switch that is capable of being mounted in space restricted applications. A wide range of actuators and optional neon lamp indicators add additional flexibility. A special pre-molded flexible cable gland allows for fast and simple wiring termination

LIFE CURVE






CIRCUITRY



General Purpose Compact Limit Switches

VL Series




SELECTION GUIDE

			
	SZL-VL-A	SZL-VL-B	SZL-VL-C
Features			
Actuator	Side Rotary - Roller Lever Standard	Side Rotary - Roller Lever Adjustable	Side Rotary - Rod Adjustable
Operating Force (O.F.)	5,88 N max. [1.32 lbs max.]	3,35 N - 7,84 N max. [0.75 lbs - 1.76 lbs max.]	2 N - 7,84 N max. [.45 lbs - 1.76 lbs max.]
Release Force (R.F.)	0,49 N min. [0.11 lbs min.]	0,21 N - 0,49 N min. [0.046 lbs - 0.11 lbs min.]	0,12 N - 0,49 N min. [0.026 lbs - 0.11 lbs min.]
Pretravel (P.T.)	20 ° max.	20 ° max.	20 ° max.
Overtravel (O.T.)	75 ° min.	75 ° min.	75 ° min.
Differential Travel (D.T.)	10 ° max.	10 ° max.	10 ° max.
Product Type	Miniature Limit Switches		
Ampere Rating	5.0 A / 0.4 A		
Supply Voltage	250 Vac max. / 125 Vdc max.		
Termination Type	Cable Gland		
Operating Temperature Range	-20 °C to 60 °C [-4 °F to 140°F]		
Vibration	55 Hz at double amplitude of 1.5 mm		
Housing Material	Zinc Die-Cast / Plastic		
Shock	10 g max.		
Circuitry	1NC 1NO SPDT; Double Break		
Approvals	UL, C-UL, CE		
Sealed	Industrial		
UL File #	E150950		
Availability	North-America; Asia-Pacific		
Sealing	IP64		
Mechanical Life	up to 10 million operations		
Series Name	VL Series		

General Purpose Compact Limit Switches

VL Series



SELECTION GUIDE

			
	SZL-VL-D	SZL-VL-E	SZL-VL-F
Features			
Actuator	Top Plunger	Cross Roller Plunger	Wobble - Plastic Rod Coil Spring
Operating Force (O.F.)	8,83 N max. [2 lbs max.]	8,83 N max. [2 lbs max.]	0,88 N max. [0.2 lbs max.]
Release Force (R.F.)	1,47 N min. [0.33 lbs min.]	1,47 N min. [0.33 lbs min.]	-
Pretravel (P.T.)	1,5 mm max. [0.060 in max.]	1,5 mm max. [0.060 in max.]	30 mm max. [1.18 in max.]
Overtravel (O.T.)	4 mm min. [0.158 in min.]	4 mm min. [0.158 in min.]	20 mm min. [0.788 in min.]
Differential Travel (D.T.)	0,7 mm max. [0.028 in. max.]	0,7 mm max. [0.028 in. max.]	-
Product Type	Minature Limit Switches		
Ampere Rating	5.0 A / 0.4 A		
Supply Voltage	250 Vac max. / 125 Vdc max.		
Termination Type	Cable Gland		
Operating Temperature Range	-20 °C to 60 °C [-4 °F to 140°F]		
Vibration	55 Hz at double amplitude of 1.5 mm		
Housing Material	Zinc Die-Cast / Plastic		
Shock	10 g max.		
Circuitry	1NC 1NO SPDT; Double Break		
Approvals	UL, C-UL, CE		
Sealed	Industrial		
UL File #	E150950		
Availability	North-America; Asia-Pacific		
Sealing	IP64		
Mechanical Life	up to 10 million operations		
Series Name	VL Series		

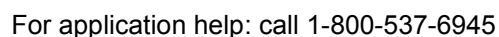
General Purpose Compact Limit Switches

VL Series

SELECTION GUIDE

			
	SZL-VL-G	SZL-VL-H	
Features			
Actuator	Wobble - Coil Spring	Roller Plunger	
Operating Force (O.F.)	0,88 N max. [0.2 lbs max.]	8,83 N max. [2 lbs max.]	
Release Force (R.F.)	-	1,47 N min. [0.33 lbs min.]	
Pretravel (P.T.)	30 mm max. [1.18 in max.]	1,5 mm max. [0.060 in max.]	
Overtravel (O.T.)	20 mm min. [0.788 in min.]	4 mm min. [0.158 in min.]	
Differential Travel (D.T.)	-	0,7 mm max. [0.028 in. max.]	
Product Type	Minature Limit Switches		
Ampere Rating	5.0 A / 0.4 A		
Supply Voltage	250 Vac max. / 125 Vdc max.		
Termination Type	Cable Gland		
Operating Temperature Range	-20 °C to 60 °C [-4 °F to 140°F]		
Vibration	55 Hz at double amplitude of 1.5 mm		
Housing Material	Zinc Die-Cast / Plastic		
Shock	10 g max.		
Circuitry	1NC 1NO SPDT; Double Break		
Approvals	UL, C-UL, CE		
Sealed	Industrial		
UL File #	E150950		
Availability	North-America; Asia-Pacific		
Sealing	IP64		
Mechanical Life	up to 10 million operations		
Series Name	VL Series		

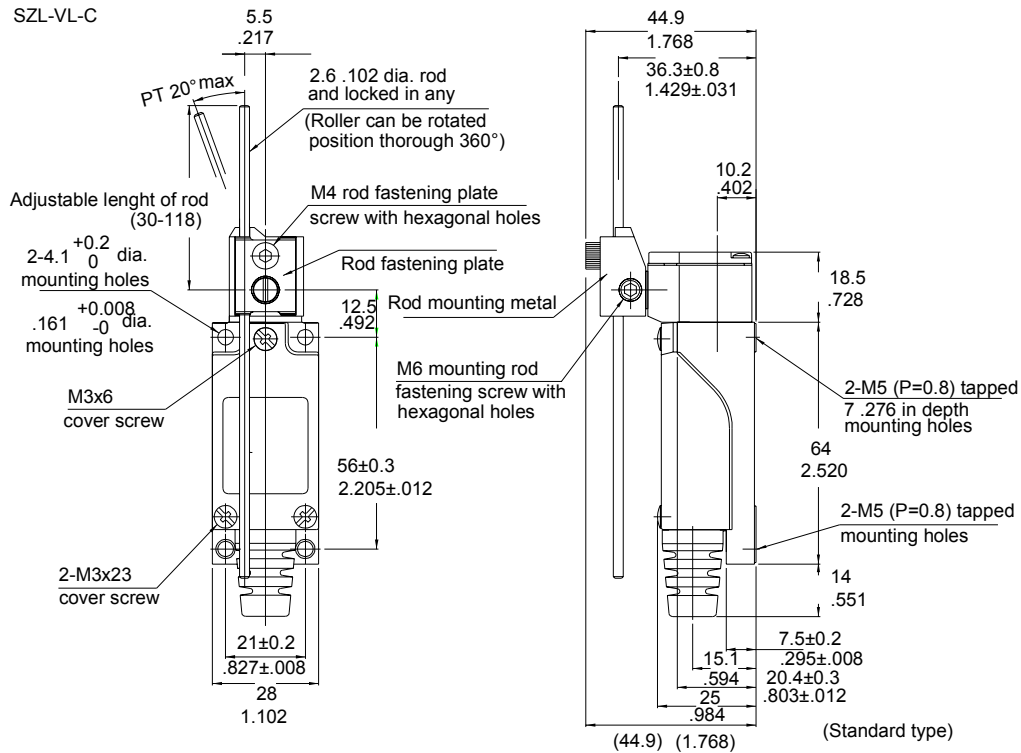
VL Series

mm
in

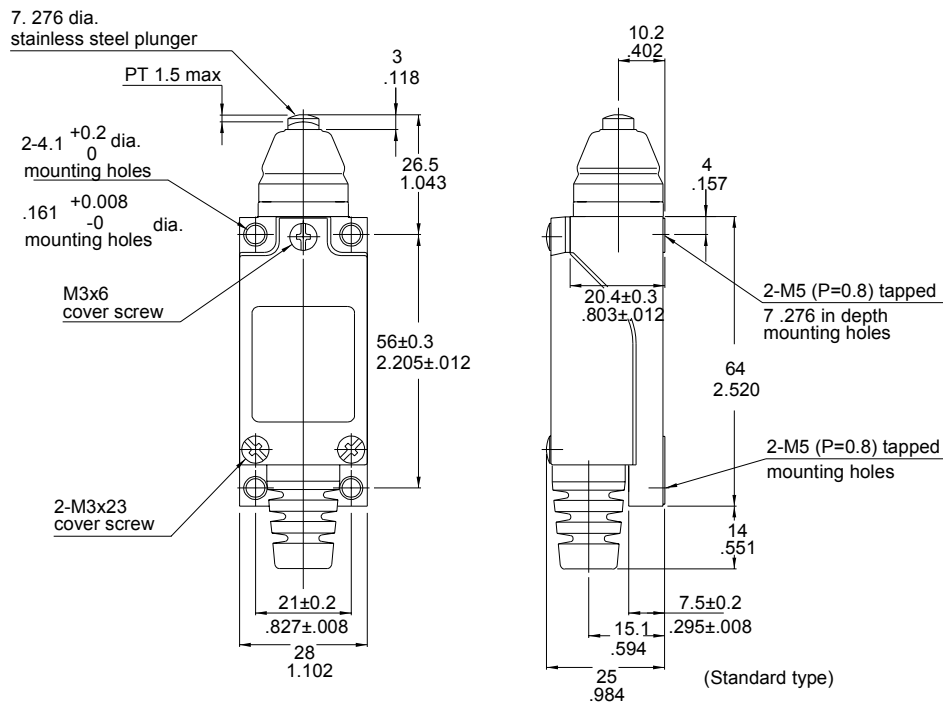
General Purpose Compact Limit Switches

VL Series

SZL-VL-C



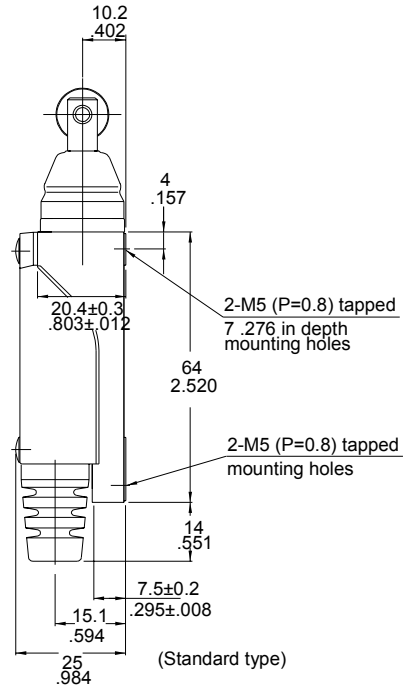
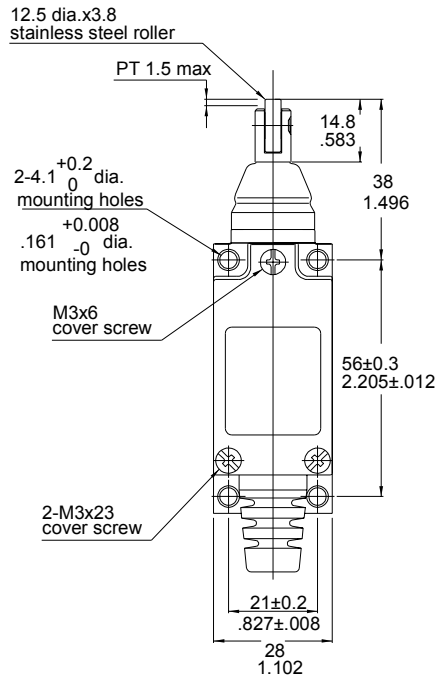
SZL-VL-D



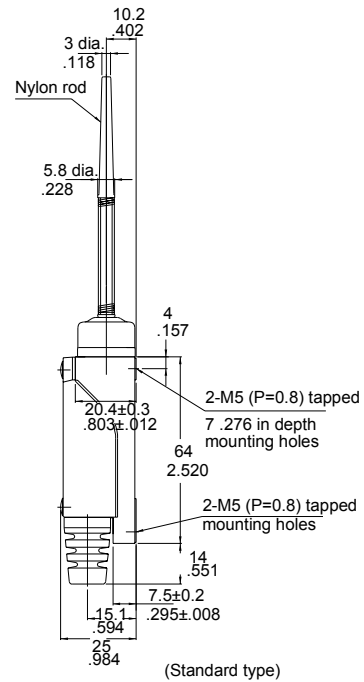
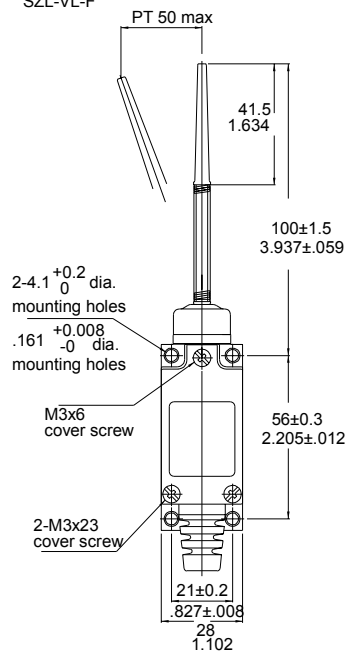
General Purpose Compact Limit Switches

VL Series

SZL-VL-E



SZL-VL-F



For application help: call 1-800-537-6945

Honeywell • Sensing and Control 7

General Purpose Compact Limit Switches

VL Series

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

For application assistance, current specifications, or name of the nearest Authorized Distributor, check the Honeywell web site or call:

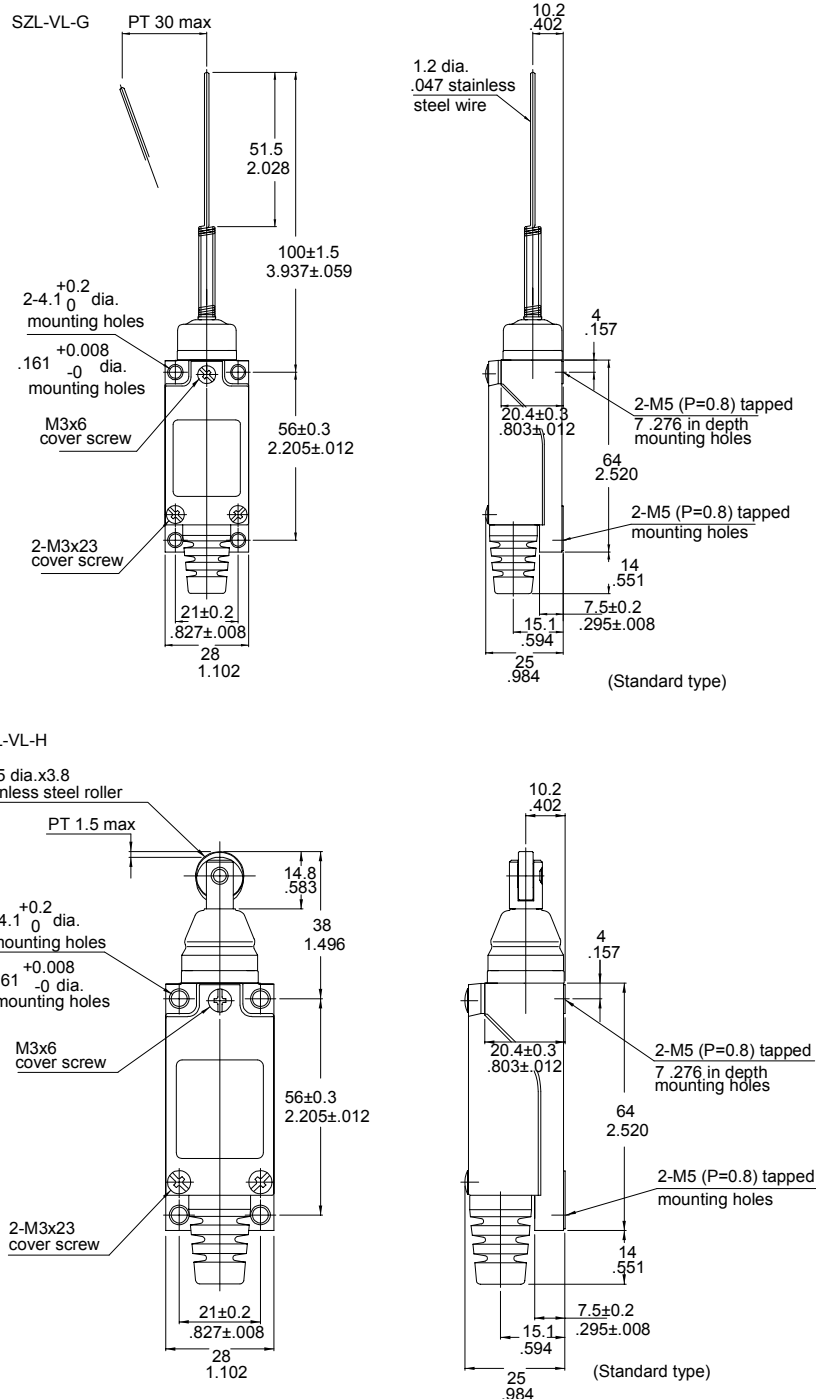
1-800-537-6945 USA
1-800-737-3360 Canada
1-815-235-6847 International

FAX

1-815-235-6545 USA

INTERNET

www.honeywell.com/sensing
info@micro.honeywell.com



Honeywell

Sensing and Control

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Freeport, Illinois 61032



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91MCE Series

Mini Compact Limit Switch



DESCRIPTION

The 91MCE series limit switch is a compliment to Honeywell's existing product line of smaller, lower cost limit switches. Designed for modern industrial OEMs, the miniature package size fits in applications where space is limited. The small package size can be gang mounted for applications requiring more than two switch circuits. The 20mm mounting pattern meets most globally accepted mounting standards.

This product family offers the user many options including a variety of different actuator styles. Connection options include

pre-leaded cable in various lengths or M12 connectors, both with side or bottom exits. Design flexibility is further enhanced with the availability of both slow action and snap action circuitry. Direct acting contacts are designed to open the NC contact when actuated. The epoxy-sealed rugged die-cast housing provides enhanced environmental durability.

Priced competitively, the 91MCE is a drop-in replacement to many products, and provides enhanced quality that customers expect from Honeywell.

FEATURES

- Direct acting contacts are designed to open NC contacts when actuated ➡
- Sealed to IP67; NEMA 1, 4, 12, 13 suitable for outdoor applications
- CE, cULus, CCC approvals meet most global approvals
- Nine actuator styles offer design flexibility
- Slow-action and snap-action circuitry options
- Pre-leaded cable and M12 connector options
- Expected mechanical life: 5 million operations
- Side exit (standard) and bottom exit connection options

POTENTIAL APPLICATIONS

- Machine equipment
- Material handling
- Aerial lifts
- Forklifts
- Off road and outdoor equipment

91MCE Series

TECHNICAL SPECIFICATIONS

Parameter	Measure
Operating speed	0,05 mm to 1 m per second
Operating frequency – mechanical	120 ops per minute
Operating frequency – electrical	30 ops per minute
Insulation resistance	> 100 Mohm @ 500 Vdc
Rated voltage	300 Vac (EN60947-5-1)
Rated thermal current	10A pre-leaded versions; 3A connector versions
Electrical rating	ac 15 A 300; dc 13 Q300
Dielectric strength	1000 Vac for one minute between current carrying parts 2500 Vac for one minute between non-current carrying parts
Expected mechanical life	5 million operations
Expected electrical life	5 x 10 ⁵ operations
Operating temperature	-25 °C to 85 °C [-13 °F to 185 °F] without the formation of ice
Humidity	< 95 % RH
Cable	5 core, 0.75 mm ²
Degree of protection	IP67

ELECTRICAL RATINGS

IEC 947-5-1 / EN 90947-5-1

Designation & Utilization Category		Rated operational current I _e (A) at rated operational voltage U _e						VA rating	
		120 V	240 V	380 V	480 V	500 V	600 V	Make	Break
AC15	A300	6	3	–	–	–	–	7200	720
		125 Vdc		250 Vdc					
DC13	Q300	0.55	0.27					69	69

BAR CHARTS

Snap-action for plunger actuators	Slow-action for plunger actuators	Snap-action for side rotary	Slow-action for side rotary
<p>Snap Action 1NO/1NC</p>	<p>Slow Action (Changeover) 1NO/1NC</p>	<p>Snap Action 1NO/1NC</p>	<p>Slow Action (Changeover) 1NO/1NC</p>

PIN OUT – “Q” OPTION

	Pin 1 & 2 – Normally Closed
	Pin 3 & 4 – Normally Open

Mini Compact Limit Switch

DIMENSIONS


91MCE1-P1/S1 – PIN PLUNGER	91MCE2-P1/S1 – ROLLER PLUNGER	91MCE3-P1/S1 – CROSS ROLLER PLUNGER
91MCE16-P1/S1 – SIDE ROTARY LEVER WITH METAL ROLLER	91MCE18-P1/S1 - PIN PLUNGER WITH BOOT SEAL	91MCE27-P1/S1 - PANEL MOUNT PIN PLUNGER
91MCE30-P1/S1 - PANEL MOUNT BOOTED PIN PLUNGER	91MCE28-P1/S1 – PANEL MOUNT ROLLER PLUNGER	91MCE29-P1/S1 – PANEL MOUNT CROSS ROLLER PLUNGER

91MCE SWITCH PART NUMBER TREE

91MCE	16	P	1	B																																																		
Switch type	Actuator code	Switch type	Cable length	Cable/connector exit	Lever type	Connector																																																
91MCE Series Mini Compact Enclosed Switch	<table><tr><td>1</td><td>Pin plunger</td></tr><tr><td>2</td><td>Roller plunger</td></tr><tr><td>3</td><td>Cross-roller plunger</td></tr><tr><td>16</td><td>Side rotary with metal lever</td></tr><tr><td>18</td><td>Pin plunger with boot seal</td></tr><tr><td>27</td><td>Pin plunger/ panel mount</td></tr><tr><td>28</td><td>Roller plunger/ panel mount</td></tr><tr><td>29</td><td>Cross roller/ panel mount</td></tr><tr><td>30</td><td>Pin plunger/panel mount w/ boot seal</td></tr></table>	1	Pin plunger	2	Roller plunger	3	Cross-roller plunger	16	Side rotary with metal lever	18	Pin plunger with boot seal	27	Pin plunger/ panel mount	28	Roller plunger/ panel mount	29	Cross roller/ panel mount	30	Pin plunger/panel mount w/ boot seal	<table><tr><td>P</td><td>1NO/1NC direct acting, snap action</td></tr><tr><td>S</td><td>1NO/1NC direct acting, BBM</td></tr></table>	P	1NO/1NC direct acting, snap action	S	1NO/1NC direct acting, BBM	<table><tr><td></td><td>Connector version</td></tr><tr><td>1</td><td>1 m [3.28 ft]</td></tr><tr><td>2</td><td>2 m [6.56 ft]</td></tr><tr><td>3</td><td>3 m [9.84 ft]</td></tr><tr><td>5</td><td>5 m [16.40 ft]</td></tr></table>		Connector version	1	1 m [3.28 ft]	2	2 m [6.56 ft]	3	3 m [9.84 ft]	5	5 m [16.40 ft]	<table><tr><td></td><td>Side exit</td></tr><tr><td>B</td><td>Bottom exit</td></tr></table>		Side exit	B	Bottom exit	<table><tr><td></td><td>Standard lever, metal roller</td></tr><tr><td>P</td><td>Standard lever, plastic roller</td></tr><tr><td>O</td><td>Short lever, metal roller</td></tr><tr><td>OP</td><td>Short lever, plastic roller</td></tr></table>		Standard lever, metal roller	P	Standard lever, plastic roller	O	Short lever, metal roller	OP	Short lever, plastic roller	<table><tr><td></td><td>Cable (no connector)</td></tr><tr><td>Q</td><td>4-pin M12 connector</td></tr></table>		Cable (no connector)	Q	4-pin M12 connector
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OP	Short lever, plastic roller																																																					
	Cable (no connector)																																																					
Q	4-pin M12 connector																																																					

WARNING

IF USED IN APPLICATIONS CONCERNING HUMAN SAFETY

- Only use NC direct opening ("positive opening"/"positive break") contacts, identified by the symbol .
- Do NOT use flexible/adjustable actuators. Only use actuators designed for safety applications.
- Do NOT defeat, tamper, remove, or bypass this switch.
- Hazardous voltage, disconnect power before servicing.
- Strictly adhere to all installation and maintenance instructions
- Consult with local safety agencies and their requirements when designing a machine-control link, interface, and all control elements that affect safety.

Failure to comply with these instructions could result in death or serious injury.

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

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Europe	+44 (0) 1698 481481; +44 (0) 1698 481676 Fax
Latin America	+1-305-805-8188; +1-305-883-8257 Fax
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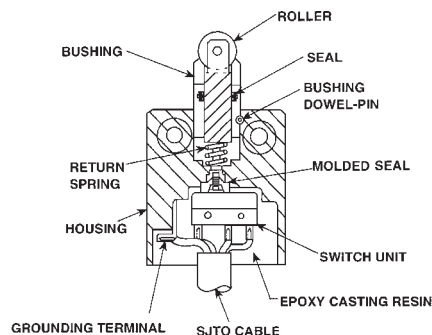
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Honeywell

Limit and Enclosed Switches

Miniature Pre-Wired Enclosed Switches

914CE Series



NOTE: Bushing seal shown refers to "K" roller plunger and cross-roller plunger list-ings only.

Factory pre-wiring with industrial quality cable (type SJTO) allows for miniaturization of the connection and eliminates the need to wire at the switch. This allows the 914CE to be used in limited access areas.

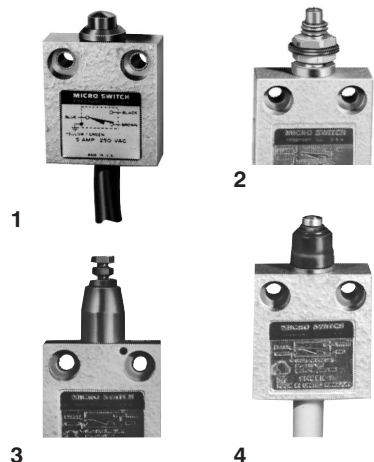
The cable electrical connection and basic switch terminals are encapsulated in an epoxy compound. An elastomer seal between the plunger and switch housing, plus mounting screw holes with continuous walls, keep liquids from entering the switch cavity. The seal boot offered on the 914CE18 and 914CE20 prevents contaminants from impeding plunger movement.

A full range of actuators is available, including plain plungers, roller plungers, side rotary, multi-directional wire, and manual. Any of the LS or HDLS limit switch levers may be used with the side rotary 914CE16. Pages A37 & A39.

914CE's may be specified with 3-foot (0,91 m), 6-foot (1,83 m), or 9-foot (2,74 m) cable.

A 90° steel bracket (Catalog Listing 933PA1) is available for mounting a switch in various planes relative to the mounting surface. See page A92.

PLUNGER ACTUATED SWITCHES



For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

FEATURES

- Miniature size
- Wide selection of actuators
- Precision characteristics
- Zinc die cast housing
- Optional mounting bracket
- Fluorocarbon seal available
- Preleaded or connector versions
- Temperature range 35° to 160°F (2° to 71°C) for NEMA 1 and 3 only versions; all others 10° to 200°F (–12° to 93°C)
- UL Recognized, file #E41859
- CSA Certified, file #LR15775
- CE Certified
- Low temp. versions available (–40°C & °F)

ELECTRICAL RATING

Circuitry	Load	Amps	
		Make	Break
<p>Single-pole Double-throw</p>	A 240 VAC, ind. 240 VAC, res. 28 VDC, res. 28 VDC, ind. UL/CSA: 5 amps, 1/10 Hp, 125 or 250 VAC	1.2 5 3 3	0.2 5 3 3
	B 1 amp res., 0.5 amp ind., 30 VDC UL Rating: 1 amp, 125 VAC		
	C UL/CSA Rating 3 amp, 125 or 250 VAC		

CABLE TERMINATION



Side Exit

GANG MOUNT TO BUILD MULTIPLE-PLUNGER SWITCH

.63 in. (16mm) between plungers.



Bottom Exit

ORDER GUIDE

Description (Bottom exit cable unless otherwise noted)	Catalog Listing*	NEMA	Elec. Rating	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
Plunger ¹	914CE1-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Plunger ¹ Gold Contacts	914CE1-3G	1,3	B	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Plunger ¹ (Side exit cable)	914CE1-3A	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Bushing mount Plunger ²	914CE27-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Adjustable Plunger ³	914CE19-3	1,3,4 12,13	A	22,2 5	1,8 .071	3,0 .118	0,1 .004
Boot sealed Plunger ⁴	914CE18-3	1,3,4 12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
Side exit cable	914CE18-3A	1,3,4 12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
Fluorocarbon Seals	914CE18-3V						

N = Newtons

* These listings have 0,91m (3 ft.) cable. To order 1.83 (6 ft.) cable, change the –3 to –6. To order 2,74m (9 ft.) cable, change the –3 to –9.

Characteristics: O.F. – Operating Force; P.T. – Pretravel; O.T. – Overtravel; D.T. – Differential Travel.

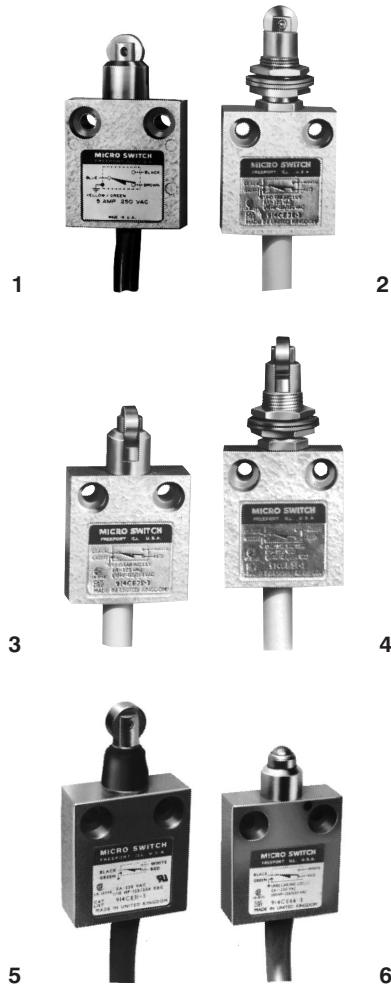
Limit/Enclosed

Miniature Pre-Wired Enclosed Switches

ROLLER PLUNGER ACTUATED SWITCHES

ORDER GUIDE

Description** (Bottom exit cable unless otherwise noted.)	Catalog Listing	NEMA	Elec. Rating	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
Roller Plunger ¹	914CE2-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
	914CE2-3K	1,3,4,6 6P,12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
	914CE2-3C	1,3	A SPDTDB	17,8 4	1,8 .071	3,0 .118	0,51 .020
Roller Plunger ¹ Gold Contacts	914CE2-3G	1,3	B	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Roller Plunger ¹ (Side exit cable)	914CE2-3A	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
	914CE2-3AK	1,3,4,6 6P,12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
Bushing Mount Roller Plunger ²	914CE28-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Cross Roller Plunger ³	914CE3-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
	914CE3-3K	1,3,4,6 6P,12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
Cross Roller Plunger ³ Gold Contacts	914CE3-3G	1,3	B	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Cross Roller Plunger ³ (Side exit cable).	914CE3-3A	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
	914CE3-3AK	1,3,4,6 6P,12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
Bushing Mount Cross-Roller Plunger ⁴	914CE29-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Boot Sealed Roller Plunger ⁵ Fluorocarbon Seals	914CE31-3	1,3,4,6 6P,12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
	914CE31-3V						
Boot Sealed Cross Roller Plunger	914CE55-3	1,3,4,6 6P,12,13	A	22,3 5	1,8 .071	3,0 .118	0,1 .004
Ball Bearing ⁶	914CE66-3	1,3	A	12,2 2.75	1,8 .071	3,0 .118	0,1 .004



NOTE:
Switches held depressed for extended periods of time at temperature extremes may experience retarded plunger return upon deactuation. Where such a condition exists in the application, contact the 800 number.

SIDE ROTARY AND WOBBLE ACTUATED SWITCHES

ORDER GUIDE

Lever not included on side rotary versions. Any LS or HDLS lever may be used. See pages A37 to A39.

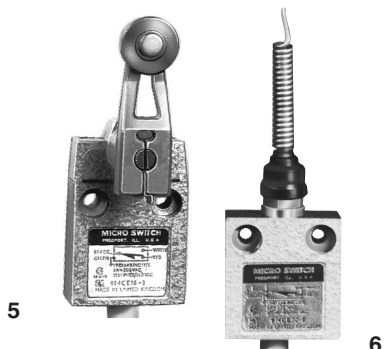
Description (Bottom exit)	Catalog Listing	NEMA	Elec. Rating	O.F. max.	P.T. max.	O.T. min.	D.T. max.
Side*** rotary ⁵	914CE16-3	1,3,4,6 6P,12,13	A	0,34 Nm 3 in. lbs.	30°	40°	3°
Side rotary ⁵ Side exit cable	914CE16-3A	1,3,4,6 6P,12,13	A	0,34 Nm 3 in. lbs.	30°	40°	3°
Multidirectional spring wire wobble actuator ⁶	914CE20-3	1,3,4,6 6P,12,13	A	0,56 N 2 oz.	—	—	—
	9PA86-CE	Replacement Actuator					

N = Newtons
* These listings have 0,91m (3 ft.) cable. To order 1,83m (6 ft.) cable, change the -3 to -6. For other cable lengths, contact the 800 number.

** Snap release not recommended on these devices.

*** Switch operates on clockwise and counterclockwise rotation of the lever shaft.

Characteristics: O.F. – Operate Force; P.T. – Pretravel; O.T. – Overtravel; D.T. – Differential Travel



Limit and Enclosed Switches

914CE Series

Miniature Pre-Wired Enclosed Switches

MANUALLY OPERATED SWITCHES



ORDER GUIDE

Description (Bottom exit cable)	Catalog Listing*	NEMA	Elec. Rating	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
.94 in. (23,9mm) dia. button	914CE22-3	1,3	A	8,9 2	1,8 .071	3,0 .118	0,1 .004

N = Newtons
*These listings have 0,91m (3 ft.) cable. To order 1,83m (6 ft.) cable, change the -3 to -6. For other cable lengths, contact the 800 number.
Characteristics: O.F. – Operate Force; P.T. – Pretravel; O.T. – Overtravel; D.T. – Differential Travel

MINIATURE ENCLOSED SWITCHES WITH CONNECTORS

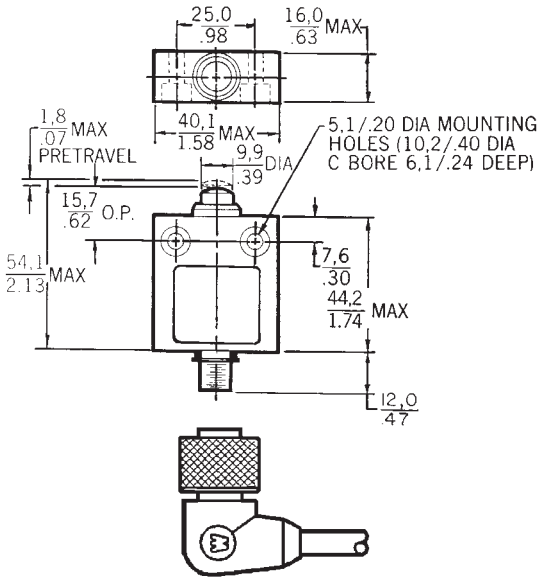
ORDER GUIDE WITH AC STYLE CONNECTORS



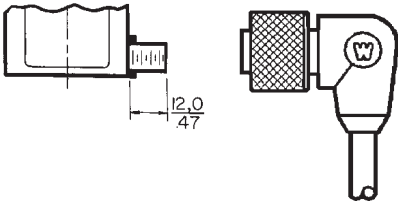
Description	Connector Exit	Catalog Listing	NEMA	Elec. Rating	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
Plunger	Bottom	914CE1-Q1	1, 3	C	12,2 2.75	1,8 .071	3,0 .118	0,1 .004
Boot sealed plunger	Bottom	914CE18-Q1	1, 3, 4, 6	C	22,3	1,8	3,0	0,1
	Side	914CE18-AQ1	12, 13		5	.071	.118	.004
Roller plunger	Bottom	914CE2-Q1	1, 3	C	12,2	1,8	3,0	0,1
	Bottom	914CE2-KQ1	1, 3, 4, 6, 12, 13		2.75	.071	.118	.004
Cross roller plunger	Bottom	914CE3-Q1	1, 3	C	12,2	1,8	3,0	0,1
	Bottom	914CE3-KQ1	1, 3, 4, 6, 12, 13		2.75	.071	.118	.004
Side rotary (w/o lever)	Bottom	914CE16-Q1	1, 3, 4, 6	C	0,34 Nm	30°	40°	3°
	Side	914CE16-AQ1	12, 13		3 in. lb.			
Bushing mount Roller plunger	Bottom	914CE28-Q1	1, 3	C	12,2 2.75	1,8 .071	3,0 .118	0,1 .004

For DC style connectors, delete the “1” at the end of the catalog listing. Example: 914CE1-Q1 (AC); 914CE1-Q (DC).

MOUNTING DIMENSIONS
PLAIN PLUNGER/RECEPTACLE



Bottom Exit Connector



Side Exit Connector

Limit/Enclosed

Miniature pre-wired enclosed switches

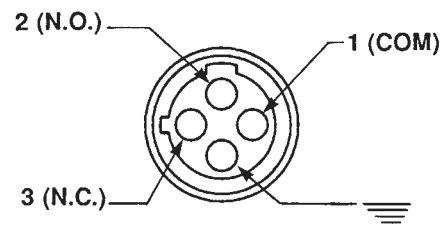
QUICK-CONNECT CABLES

914CE switches mate with the quick-connect cables listed below. The cable has PVC sheathing and #22 AWG leadwires.

AC STYLE CABLES

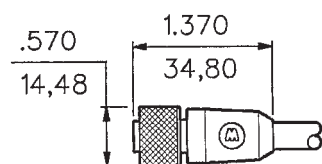
Connector Style	Cable Length	Catalog Listing
Straight	6'	704000D02F060
	20'	704000D02F200
Right angle (90°)	6'	704001D02F060
	20'	704001D02F200

AC Style Pin Configuration (male receptacle)

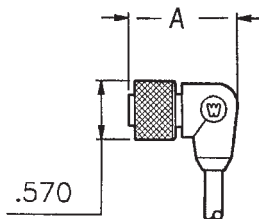


Pin Layout

MOUNTING DIMENSIONS



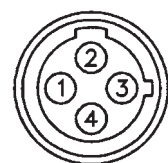
Straight Style Connector



Right Angle (90°) Style Connector

Dimension "A"
AC Style – 1.375 (34,9)
DC Style – 1.050 (26,7)

AC Style Pin Configuration (cable plug) (Face view of female connector)

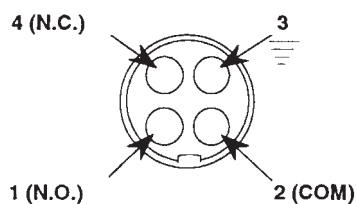


Pin #1 = Red w/Black Tr.–Common
Pin #2 = Red w/White Tr.–Normally Open
Pin #3 = Red–Normally Closed
Pin #4 = Green–Ground

DC STYLE CABLES

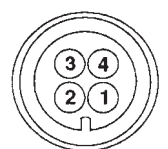
Connector Style	Cable Length	Catalog Listing
Straight	2 M	804000A09M020
	5 M	804000A09M050
Right angle (90°)	2 M	804001A09M020
	5 M	804001A09M050

DC Style Pin Configuration (male receptacle)



Pin Layout

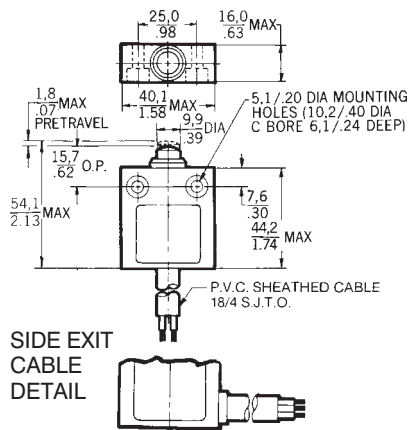
DC Style Pin Configuration (cable plug) (Face view of female connector)



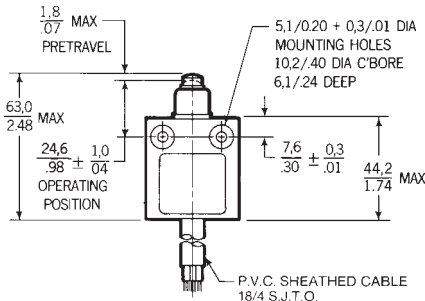
Pin #1 = Brown leadwire/Normally opened
Pin #2 = White leadwire/Common
Pin #3 = Blue leadwire/Ground
Pin #4 = Black leadwire/Normally closed

Mounting Dimensions

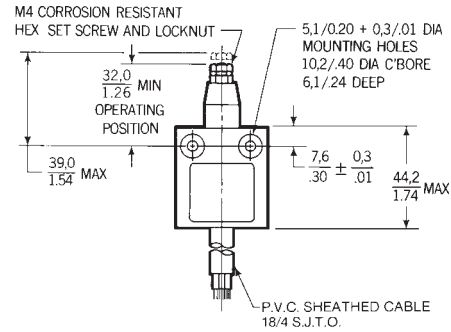
PLUNGER/CABLE



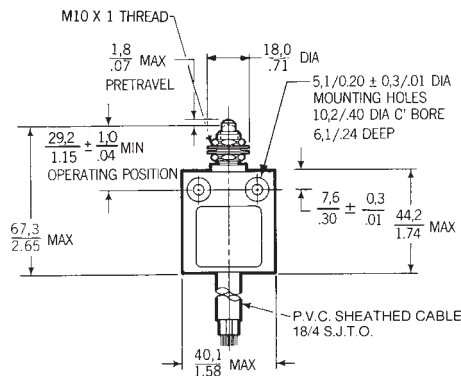
PLUNGER (With seal boot)



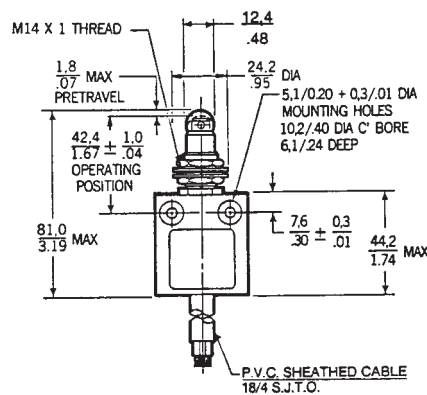
ADJUSTABLE PLUNGER



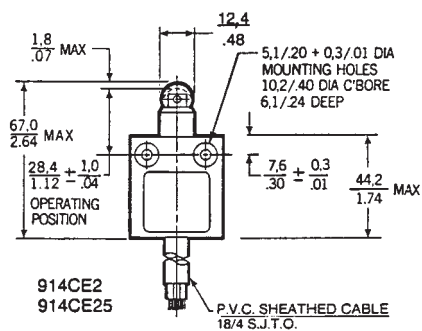
PLUNGER (Bushing mount)



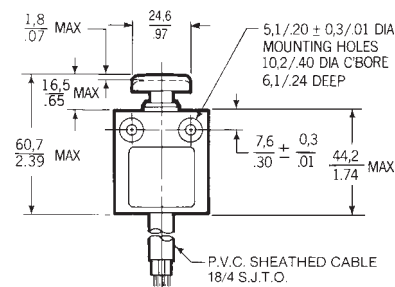
ROLLER PLUNGER (Bushing mount)



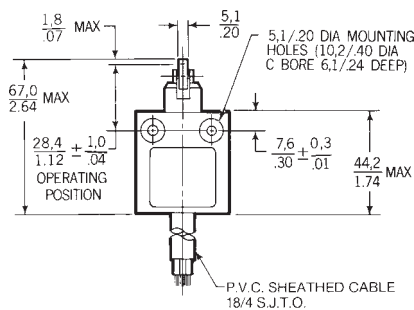
ROLLER PLUNGER



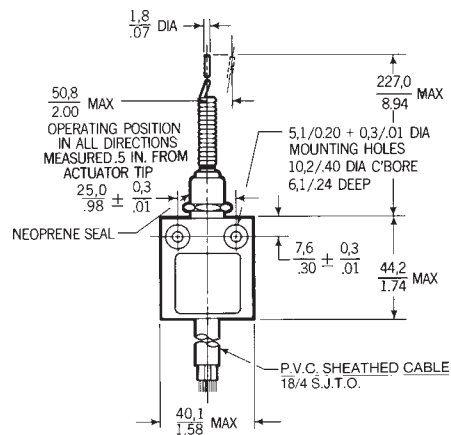
MANUAL OPERATOR



CROSS ROLLER PLUNGER



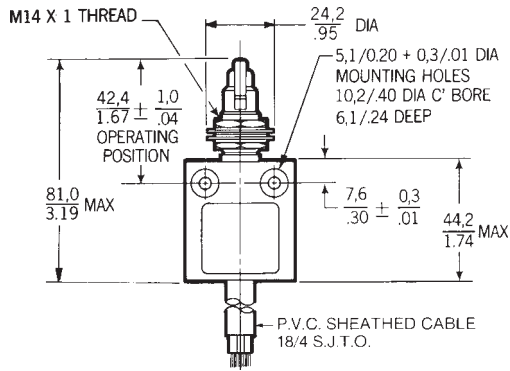
MULTIDIRECTIONAL WIRE



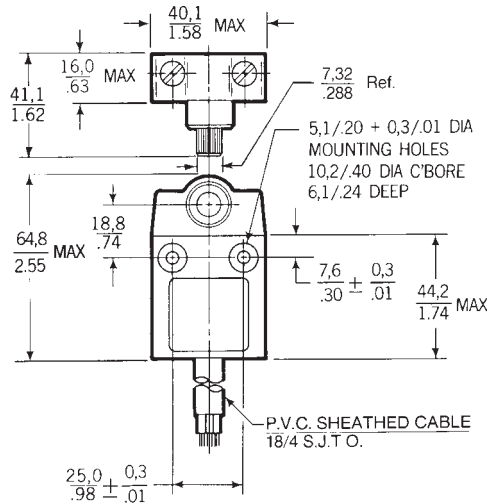
Limit/Enclosed

Mounting Dimensions

CROSS ROLLER PLUNGER (Bushing mount)

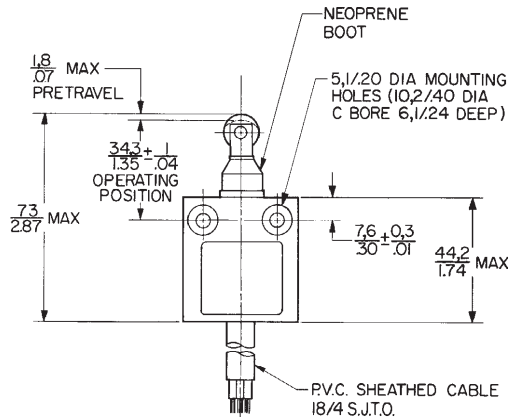


SIDE ROTARY*



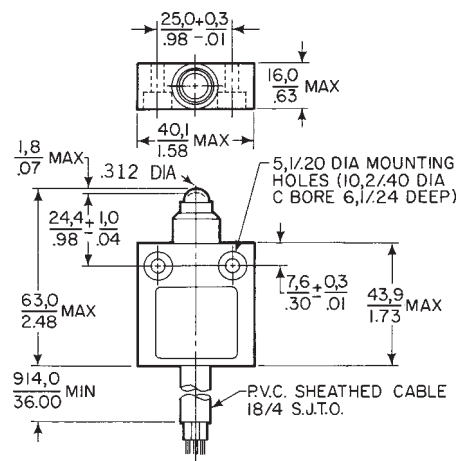
* Any LS or HDLS limit switch lever can be used with this switch.

BOOT SEALED ROLLER PLUNGER

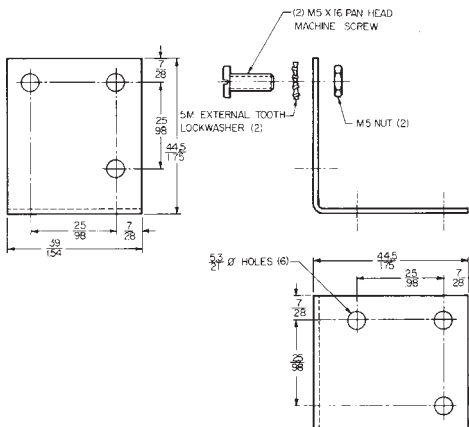


MOUNTS THRU .517/13,13 DIA. HOLE IN PANEL .165/4,19 MAX. THICK

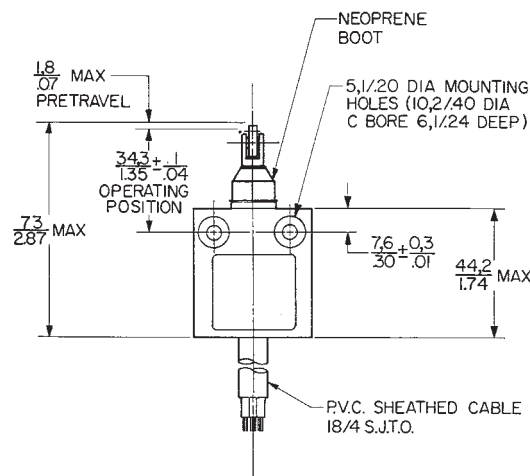
BALL BEARING



MOUNTING BRACKET 933PA1



BOOT SEALED CROSS ROLLER PLUNGER



Key: $\frac{0,0}{0,00} = \text{mm}$
 $\frac{0,00}{0,00} = \text{inches}$

Limit and Enclosed Switches

Plastic Enclosed Switches

BF Series



BF Series Plastic Enclosed Basic Switches are available with a wide variety of operators, and are designed for easy mounting and wiring.

BF switches mount utilizing two (2) #6 screws installed through the two diametrically opposite mounting holes in the switch housing (2.312 in x 1.375 in spacing). The BF switches are designed to allow mounting with the cover either towards or away from the mounting surface. It may be more convenient to select the appropriate operator orientation to allow mounting with the cover away from the mounting surface, permitting wiring after mounting.

Switches with lever type actuators (actuator code L in the second position after the dash) are adjustable in two directions. The entire actuator can be rotated around its mounting bushing, and the angle of the lever can also be changed.

FEATURES

- Wide variety of actuators — roller levers, wobble levers, and pin plungers
- Four conduit openings:
 - 1/2-14 NPT
 - 1/2-14 NPSM
 - PF1/2
 - PG13.5
- Large internal cavity for easy wiring
- Pressure plate style wire clamps
- Rugged plastic enclosure eliminates need for grounding
- Several basic switches available ranging from 0.1 Amp electronic duty gold contact to 11 Amp 1/3 HP
- Sealed to NEMA 1, 3, 4 and 13 requirements
- Wide temperature range, –25 to +160°F (–31 to +71°C)
- UL recognized

TYPICAL APPLICATIONS

- Overhead cranes and hoists
- Surface transportation equipment
- Special machinery
- Agricultural equipment
- Earth moving equipment

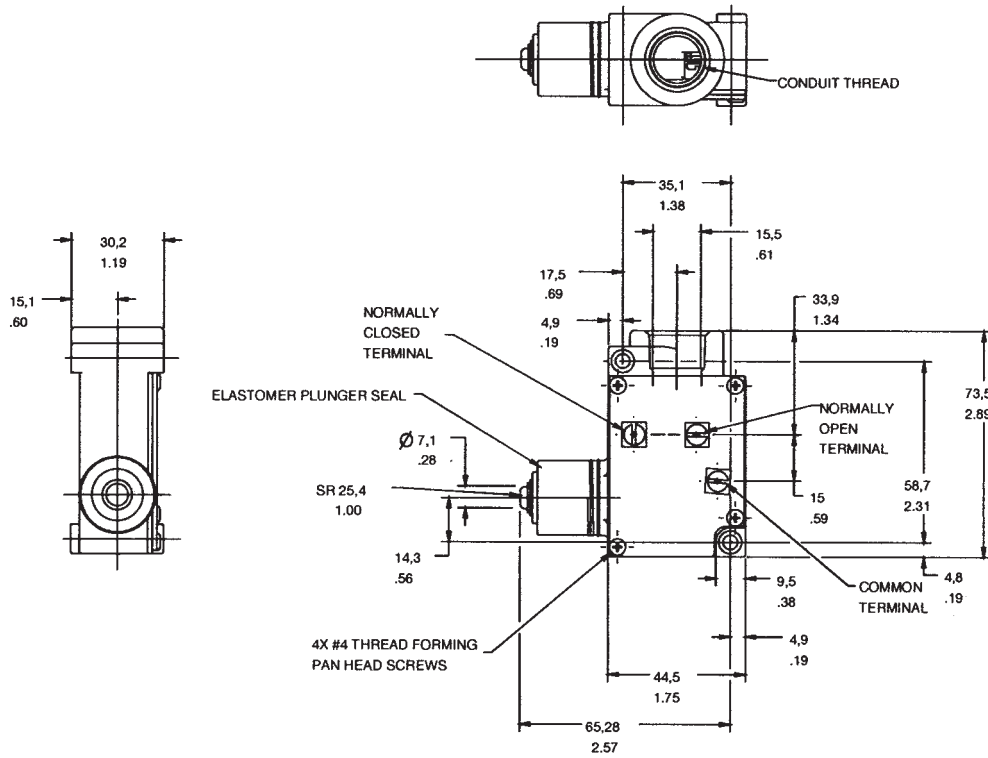
Limit/Enclosed

Limit and Enclosed Switches

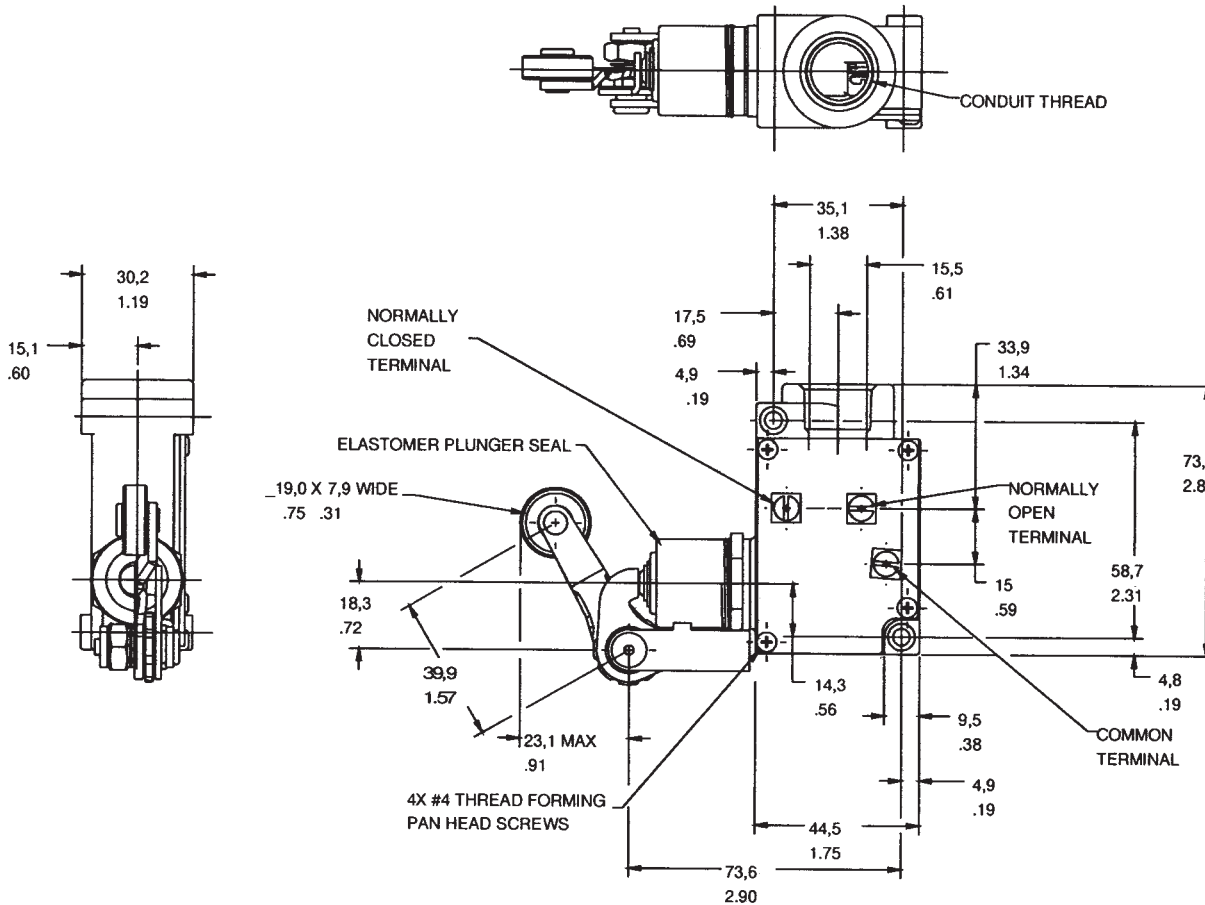
BF Series

Plastic Enclosed Switches

PIN PLUNGER



ROLLER LEVER



Limit/Enclosed

Limit and Enclosed Switches

Compact Enclosed Switches

E6/V6 Series



FEATURES

- Side or flange mount
- Momentary or maintained contact
- Grounding screw
- High capacity (22 amp) available
- Temperature range –25°F to +160°F (–32° to +71°C)
- Cast zinc housing NEMA 1
- UL Recognized, file #E12252
- CSA Certified, file #LR41372
- E6 NEMA 1
- V6 NEMA 1, 3
- Epoxy filled NEMA 1, 3, 4, 12, 13
- Preleaded or connector termination options

STRAIGHT PLUNGER ACTUATED SWITCHES



Side mount with seal boot



Side mount without seal boot

ROLLER PLUNGER ACTUATED SWITCHES



Side mount with seal boot

E6 (side mount) and V6 (flange mount) switches are offered with or without actuator seal boots. Both have a combination insulator/seal cemented inside the bottom enclosure. Lead washers are used to seal the

mounting holes on side mount switches. All side mount switches are installed with #6 screws, except the BZE6-2RN7 (#8 screws). Removal of the bottom enclosure exposes the terminals for easy wiring.

ELECTRICAL RATING

Circuitry	Electrical Rating	
<p>Single-pole Double-throw</p>	A	UL/CSA Rating: 15 amps, 125, 250 or 480 VAC: 2 amps, 600 VAC: 1/8 Hp, 125 VAC: 1/4 Hp, 250 VAC: 1/2 amp, 125 VDC: 1/4 amp, 250 VDC.
<p>Double-pole Double-throw</p>	B	UL/CSA Rating: 10 amps, 125 or 250 VAC: 0.3 amp, 125 VDC: 0.15 amp, 250 VDC.

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.P. mm in.	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot SPDT.	A	Side	BZE6-2RN	43,66 ± 0,76 1.719 ± .030	2,50-6,67 9-24	1,98 .078	5,56 .219	0,05 .002
		Flange	BZV6-2RN	69,09 ± 1,52 2.720 ± .060				
Same as BZE6-2RN except #8 Mounting screws.	A	Side	BZE6-2RN7	43,66 ± 0,76 1.719 ± .030	2,50-6,67 9-24	1,98 .078	5,56 .219	0,05 .002
With seal boot. DPDT.	B	Side	DTE6-2RN	46 ± 0,76 1.812 ± .030	7,23-16,4 26-59	2,80 .110	3,17 .125	1,53 .060
		Flange	DTV6-2RN	71,4 ± 0,76 2.812 ± .030				
Without seal boot. SPDT.	A	Side	BZE6-2RQ	38,1 ± 0,76 1.500 ± .030	2,50-3,62 9-13	0,38 .015	5,56 .219	0,05 .002
		Flange	BZV6-2RQ	63,5 ± 1,14 2.500 ± .045				

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.P. mm in.	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot. Roller parallel to long axis of switch. SPDT	A	Side	BZE6-2RN80	56,7 ± 1,14 2.232 ± .045	2,50-6,68 9-24	1,98 .078	5,55 .219	0,05 .002
		Flange	BZV6-2RN80	82,1 ± 1,14 3.232 ± .045				
With seal boot. Roller parallel to long axis of switch. DPDT.	B	Side	DTE6-2RN80	59,6 ± 1,0 2.345 ± .040	5,56-13,3 20-48	2,80 .110	3,17 .125	1,53 .060
Without seal boot. Roller parallel to long axis of switch. SPDT.	A	Side	BZE6-2RQ8	49,6 ± 1,14 1.953 ± .045	2,50-3,62 9-13	0,38 .015	3,55 .140	0,05 .002
		Flange	BZV6-2RQ8	75 ± 1,52 2.953 ± .060				

N = Newtons

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel; O.P. — Operating Position.

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

Limit and Enclosed Switches

E6/V6 Series

Compact Enclosed Switches

CROSS ROLLER PLUNGER ACTUATED SWITCHES



Flange mount
without seal boot

ROLLER LEVER ACTUATED SWITCHES



Flange mount
with seal boot



Side mount
without seal boot

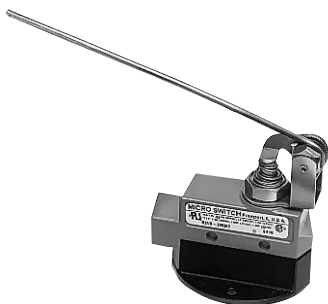
ONE-WAY ROLLER LEVER ACTUATED SWITCHES



Side mount
with seal boot

LOW FORCE ROD LEVER

Rod can be formed in-line with the switch once, or cut, for application.



Flange mount
without seal boot

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.P. mm in.	O.F. N oz.	P.T. mm in.	O.T. mm in.	D.T. max. mm in.
Without seal boot. Roller perpendicular to long axis of switch. SPDT.	A	Side	BZE6-2RQ81	49,6 ± 1,14 1.953 ± .045	2,50-3,62 9-13	0,38 .015	3,55 .140	0,05 .002
		Flange	BZV6-2RQ81	75 ± 1,52 2.953 ± .060				
As above with seal boot.	A	Side	BZE6-2RN81	56,7 ± 1,14 2.232 ± .045	2,5-6,67 9-24	1,98 .078	5,56 .219	0,05 .002
		Flange	BZV6-2RN81	82,1 ± 1,14 3.232 ± 0.45				

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot. Field adjustable 360° horizontally and 225° vertically.	SPDT	Side	BZE6-2RN2	2,78-5,57 10-20	4,78 .188	5,56 .219	0,15 .006
		Flange	BZV6-2RN2				
	DPDT	Side	DTE6-2RN2	2,78-8,35 10-30	6,76 .266	5,56 .219	4,19 .165
		Flange	DTV6-2RN2				
Without seal boot. Adjustable as above, except horizontal adjustment in 45° increments.	SPDT	Side	BZE6-2RQ2	2,78-5,01 10-18	4,78 .188	5,56 .219	0,15 .006
		Flange	BZV6-2RQ2				
	DPDT	Side	DTE6-2RQ2	2,78-5,57 10-20	6,76 .266	5,56 .219	4,19 .165
		Flange	BZV6-2RQ2				

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot. Field adjustable 360° horizontally and 180° vertically. SPDT.	A	Side	BZE6-2RN28	2,22-5,57 8-20	5,95 .234	5,56 .219	0,15 .006
		Flange	BZV6-2RN28				

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
Without seal boot. Field adjustable 360° horizontally in 45° increments and 250° vertically. SPDT.	A	Side	BZE6-2RQ62	0,55-1,39 2-5	18,24 .718	21,2 .838	5,82 .229
		Flange	BZV6-2RQ62				
As above, but with seal boot.	A	Side	BZE6-2RN62	0,83-1,95 3-7	18,24 .718	21,2 .838	5,82 .229
		Flange	BZV6-2RN62				

N = Newtons

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

Limit/Enclosed

Compact Enclosed Switches

MANUALLY ACTUATED SWITCHES

With 1.5 inch (38,1 mm) button.



COIL SPRING



WOBBLE LEVER ACTUATED SWITCHES

Side mount
with seal boot

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot. Field adjustable 360° horizontally and 180° vertically. SPDT.	A	Side	BZE6-2RN4	2,78-5,57	4,78 .188	5,56 .219	0,15 .006
		Flange	BZV6-2RN4	10-20			
As above, but without seal boot.	A	Side	BZE6-2RQ4	2,78-5,00	4,78 .188	5,56 .219	0,15 .006
		Flange	BZV6-2RQ4	10-18			

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.F. max. N oz.	P.T. max.
With seal boot. Operates from any direction, except pull. SPDT.	A	Side	BZE6-2RN18	1,95 7	15°
		Flange	BZV6-2RN18		

MAINTAINED CONTACT (RESET) SWITCHES

The switches shown below provide maintained contact after the operating force on either top or bottom plunger is released. Note: The top plungers on these switches provide more accurate and uniform operation than the “reset” plungers and should be used when closely held operating characteristics are required.

ELECTRICAL RATING

Circuitry	Electrical Rating
<p>Single-pole Double-throw</p>	<p>C UL/CSA Rating: L67 15 amps, 125, 250 or 480 VAC; ¼ Hp, 125 VAC; ½ Hp, 250 VAC; ½ amp, 125 VDC; ¼ amp, 250 VDC.</p>

STRAIGHT PLUNGER ACTUATED (RESET) SWITCHES



Side mount
with seal boot

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.P. mm in.	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	Reset O.F. min. N* oz.
Without seal boot. SPDT.	C	Side	BZE6-RQX2	38,1±0,76 1.500±.030	1,66-2,65 6-9.5	0,31 .012	4,75 .187	2,22 8
		Flange	BZV6-RQX2	63,5±1,1 2.500±.045				
With seal boot. SPDT.	C	Side	BZE6-RNX1	43,66±0,76 1.718±.030	1,66-5,57 6-20	1,98 .078	4,75 .187	1,66 6
		Flange	BZV6-RNX1	69,1±1,53 2.720±.060				

ROLLER PLUNGER ACTUATED (RESET) SWITCHES



Side mount
without seal boot

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing	O.P. mm in.	O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	Reset O.F. min. N* oz.
Without seal boot. Roller parallel to long axis to switch. SPDT.	C	Side	BZE6-RQ8X2	51,2±1,15 2.015±.045	1,67-2,64 6-9.5	0,31 .012	3,56 .140	2,22 8

N = Newtons

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; O.P. — Operating Position

Limit and Enclosed Switches

E6/V6 Series

Compact Enclosed Switches

ROLLER LEVER ACTUATED (RESET) SWITCHES

ORDER GUIDE



Side mount without seal boot

Description	Elec. Rating	Mtg.	Catalog Listing	O.F. max. N oz.	P.T. max. mm in.	O.T. min. mm in.	Reset O.F. min. N oz.
Without seal boot. Field adjustable 360° horizontally in 45° increments and 180° vertically. SPDT.	C	Side	BZE6-RQ2X2	2,78-5,01 10-18	4,78 .188	5,56 .219	2,22 8
		Flange	BZV6-RQ2X2				
With seal boot. Adjustable as above. SPDT.	C	Side	BZE6-RN2X1	4,45 16	4,78 .188	5,56 .219	3,33-8,35 12-30
		Flange	BZV6-RN2X1				

REPLACEMENT PARTS

Bottom enclosure includes bottom half of enclosure, insulator seal and two screws. Seal boot includes the elastomer plunger seal, and retaining hardware. Basic packet includes mounting hardware and seal boot, where applicable.

CONDUIT SEALING PACKETS

Packet	Cable O.D. Inches
2PA6	.400" – .435"
2PA16	.435" – .470"
2PA1	.530" – .570"

Limit/Enclosed

Catalog Listing	Bottom Enclosure	Seal Boot	Basic Packet	Switching Unit	Actuator
BZE6-2RN BZV6-2RN	3PA13-E6 3PA14-V6	10PA2	1PA2*	BZ-2RQ77**	—
BZE6-2RN7	3PA13-E6	10PA2	1PA46*	BZ-2RN730**	—
BZE6-2RQ BZV6-2RQ	3PA13-E6 3PA14-V6	—	1PA1	BZ-2RQ66**	—
BZE6-2RQ8 BZV6-2RQ8	3PA13-E6 3PA14-V6	—	—	BZ-2RQ784**	—
BZE6-2RQ81 BZV6-2RQ81	3PA13-E6 3PA14-V6	—	1PA19	BZ-2RQ785**	—
BZE6-2RN80	3PA13-E6	10PA2	1PA54-BZ*	BZ-2RN784	—
BZE6-2RN2 BZV6-2RN2	3PA13-E6 3PA14-V6	10PA2	1PA13*	BZ-2RN702**	6PA2*
BZE6-2RQ2 BZV6-2RQ2	3PA13-E6 3PA14-V6	—	1PA3	BZ-2RQ68**	6PA1
BZE6-2RN28 BZV6-2RN28	3PA13-E6 3PA14-V6	10PA2	1PA13*	BZ-2RN702**	6PA16*
BZE6-2RQ62 BZV6-2RQ62	3PA13-E6 3PA14-V6	—	1PA3	BZ-2RQ68**	6PA62
BZE6-2RN62 BZV6-2RN62	3PA13-E6 3PA14-V6	10PA2	1PA13*	BZ-2RN702**	6PA140-E6*
BZE6-2RQ4 BZV6-2RQ4	3PA13-E6 3PA14-V6	—	1PA3	BZ-2RQ68**	6PA7
BZE6-RQX2 BZV6-RQX2	8PA54-E6 8PA53-V6	—	1PA1	BZ-RQX66**	—
BZE6-RNX1 BZV6-RNX1	8PA56-E6 8PA55-V6	10PA2	1PA2*	BZ-RQX167**	—
BZE6-RQ8X2	8PA54-E6	—	1PA19	BZ-RQX784**	—
BZE6-RQ2X2 BZV6-RQ2X2	8PA54-E6 8PA53-V6	—	1PA3	BZ-RQX68**	6PA1
BZE6-RN2X1 BZV6-RN2X1	8PA56-E6 8PA55-V6	10PA2	1PA13*	BZ-RNX702**	6PA2*
BZE6-2RN4 BZV6-2RN4	3PA13-E6 3PA14-V6	10PA2	1PA13*	BZ-2RN702**	6PA9*
BZE6-2RN18 BZV6-2RN18	3PA13-E6 3PA14-V6	10PA2	—	BZ-2R-A2	6PA195*
DTE6-2RN† DTV6-2RN†	3PA13-E6 3PA14-V6	10PA2	1PA2*	DT-2R-A7	8PA14
DTE6-2RN2† DTV6-2RN2†	3PA13-E6 3PA14-V6	10PA2	—	DT-2R-A7	6PA2*

*Includes seal boot.

**Includes basic packet.

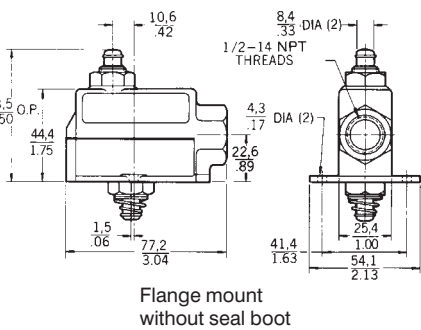
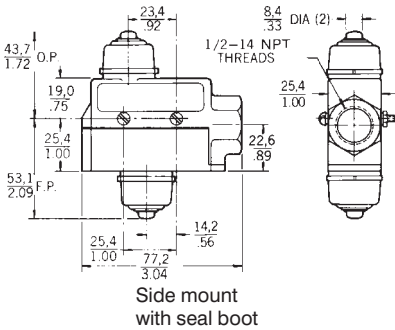
†To replace internal plunger, order 8PA14.

E6/V6 Series

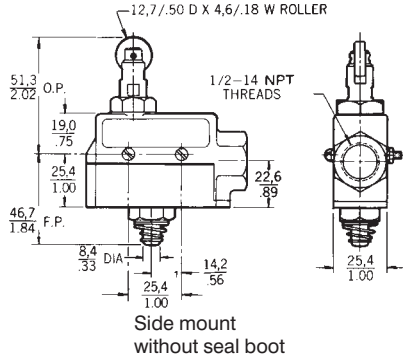
Epoxy Filled

MOUNTING DIMENSIONS (continued)

PLUNGER (Reset)



ROLLER PLUNGER (Reset)



Epoxy Filled Compact Enclosed Switches

The Epoxy Filled Compact Enclosed Switch is a very rugged, but economical solution for precision switching needs for a variety of applications in heavy equipment. **This may be the cost effective solution you've been looking for.**

TYPICAL APPLICATIONS

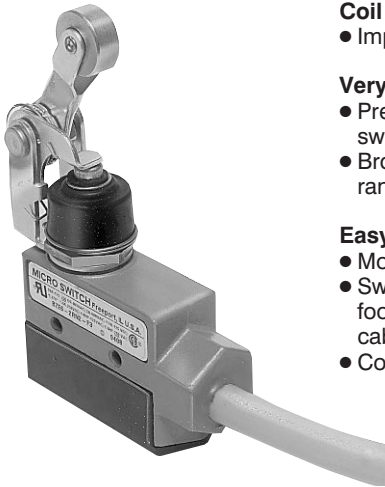
- Trash compactors – mobile or stationary
- Off-road construction equipment
- Machine tools where precision switching is needed
- Heavy machinery
- Bottling machinery

Designed for demanding environments

- Rugged zinc diecast housing with phosphate sealed epoxy finish

Resists harsh conditions

- Switch wiring cavity is epoxy filled
- Wire entry area completely factory sealed
- NEMA 1, 3, 4, 12, 13



Fits wide variety of applications

- Seven different actuator styles
- Coil spring boot band**
- Improved sealing

Very reliable operation

- Precision snap-action basic switch within housing
- Broad electrical and temperature ranges

Easy and economical to install

- Mounts with just two screws
- Switch is preloaded with three (3) foot, four (4) conductor ST00W-A cable .41-.46 in. (10.4-11.7 mm)
- Connector versions available

ORDERING GUIDE FOR EPOXY FILLED E6/V6 TYPES

Description	Catalog Listing
Straight plunger.	BZE6-2RN-F3
Straight plunger 4 pin connector.	BZE6-2RN-FR
Roller lever. Field adjustable 360° horizontally and 225° vertically	BZE6-2RN2-F3
Coil spring wobble lever. Operates from any direction except pull.	BZE6-2RN18-C3*
Low force rod lever. Field adjustable 360° horizontally in 45° increments and 180° vertically.	BZE6-2RN62-F3

* Note: This switch has a pin plunger and the wiring cavity cannot be completely filled with epoxy. They are sealed at the conduit opening only.

Limit/Enclosed

Enclosed Switches



BZG/BZH switches have a neoprene seal gasket between the housing halves, elastomer boot actuators, sealed conduit connectors, and die cast aluminum housing. Mounting holes are located outside the switch cavity and accept No. 10 screws. A neon pilot light can be added to switches having two conduit openings to indicate contact status.

FEATURES


- Pilot light (optional)
- Cast aluminum housing
- Side or flange mount

- Single and double conduit openings
- UL Recognized, file #E12252
- Grounding screw
- Sealed to NEMA 1, 3, 4, and 13

ACCESSORIES

Pilot Light 110-220 VAC (complete with seal) **15LT1**
 Wiring Seal (for No. 14 type "S" rubber jacketed cord) **2PA1**

ELECTRICAL RATING

Circuitry	Electrical Rating
 Single-pole Double-throw	A UL Rating 15 amp, 125, 250 or 480 VAC; 2 amp, 600 VAC; 1/8 Hp, 125 VAC; 1/4 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp 250 VDC.

STRAIGHT PLUNGER ACTUATED SWITCHES



Flange mount
with seal boot

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing		O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
			1 Conduit Opening	2 Conduit Openings				
With seal boot. SPDT.	A	Side	BZG1-2RN	BZG2-2RN	2,50- 6,68 9-24	1,98 .078	5,56 .219	0,05 .002
		Flange	BZH1-2RN	BZH2-2RN				
Seal boot with roller plunger	A	Side	BZG1-2RN80	—				

ROLLER LEVER ACTUATED SWITCHES



Side mount
with seal boot

ORDER GUIDE

Description	Elec. Rating	Mtg.	Catalog Listing		O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
			1 Conduit Opening	2 Conduit Openings				
With seal boot. Field adjustable 360° horizontally and 225° vertically. SPDT.	A	Side	BZG1-2RN2	BZG2-2RN2	2,78- 5,57 10-20	4,78 .188	5,56 .219	0,15 .006
		Flange	BZH1-2RN2	BZH2-2RN2				

LOW FORCE ROD ACTUATED SWITCHES



Side mount
with seal boot

ORDER GUIDE

Rod can be cut or bent to suit application needs

Description	Elec. Rating	Mtg.	Catalog Listing		O.F. N oz.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
			1 Conduit Opening	2 Conduit Openings				
With seal boot. Field adjustable 360° horizontally and 250° vertically. SPDT.	A	Side	BZG1-2RN62	BZG2-2RN62	0,83- 1,95 3-7	18,24 .718	21,29 .838	5,82 .229
		Flange	BZH1-2RN62	BZH2-2RN62				

N = Newtons

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

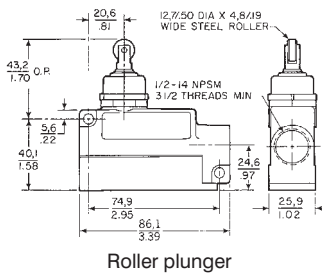
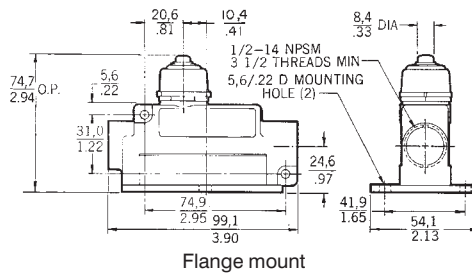
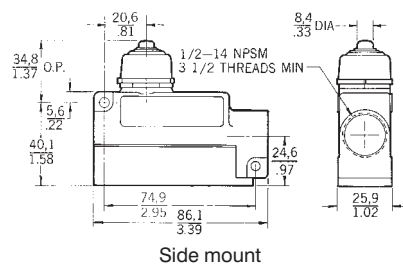
Enclosed Switches

REPLACEMENT PARTS

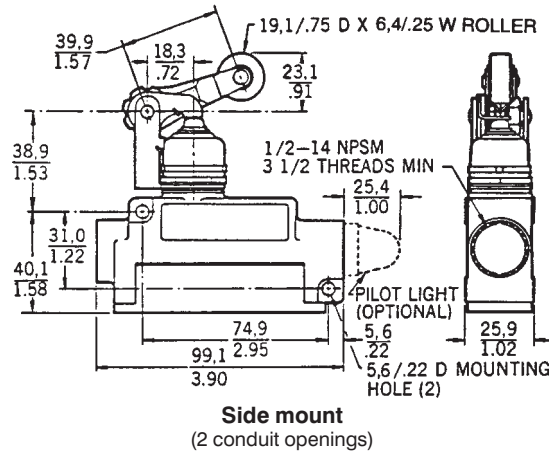
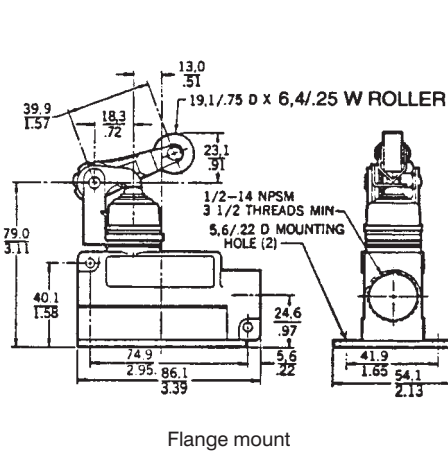
	Catalog Listing
Switching Units For Straight Plunger Switch For Roller or Rod Lever Switch	BZ-2RN770 BZ-2RN702
Actuators Roller Lever Rod Lever Seal Boot , including retaining hardware	6PA2 6PA140-E6 10PA2

MOUNTING DIMENSIONS (For reference only)

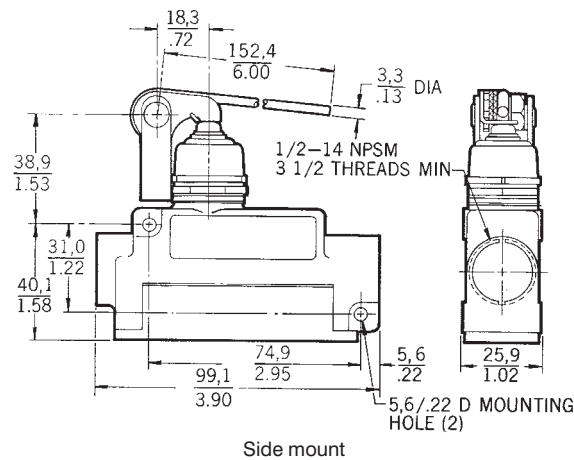
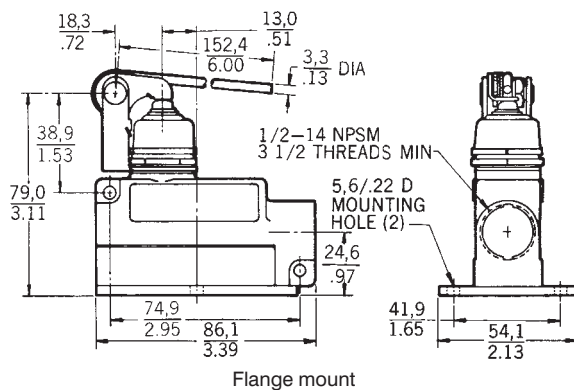
PLUNGER



ROLLER LEVER



ROD



Key: 0.0 = mm
0.00 = inches

Limit/Enclosed

Limit and Enclosed Switches

High Capacity Enclosed Switches

BAF1 Series



The elastomer boot on sealed actuator versions protects the actuating mechanism and the internal basic switch from contaminants. There is a seal gasket between the cover plate and the enclosures on all versions.

The cover plate is removed for ease of wiring and switch replacement without demounting the switch.

The actuator position is designated “right” or “left,” when looking at the nameplate.

FEATURES

- Up to 20 ampere capacity
- Cast aluminum housing with 3-hole mounting
- Right or left-hand (sealed or unsealed) actuators

- Cover seal, captive cover screws
 - Momentary or maintained contact
 - UL Recognized, file #E12252
 - CSA Certified, file #LR41372
 - Grounding screw
 - NEMA 1, 3*, 4*, and 13*
- (* except BAF1-2RQ9 listings)

ELECTRICAL RATING

Circuitry	Electrical Rating
<p>Double-pole Double-throw</p>	<p>B</p> <p>UL/CSA Rating: 10 amps, 125 or 250 VAC; 0.3 amp, 125 VDC; 0.15 amp, 250 VDC.</p>
<p>High Capacity SPDT</p>	<p>D</p> <p>UL/CSA Rating: 20 amps, 125, 250 or 480 VAC; 1 Hp, 125 VAC; 2 Hp, 250 VAC; ½ amp, 125 VDC; ¼ amp, 250 VDC; Lamp Load — 10 amps, 125 VAC.</p>

STRAIGHT PLUNGER ACTUATED SWITCHES



With seal boot, right-hand actuator

ORDER GUIDE

Description	Elec. Rating	Actuator Position†	Catalog Listing	O.P. mm in.	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot.	D	Right	BAF1-2RN-RH	53,19±0,76	11,2	2,39	5,56	0,26
		Left	BAF1-2RN-LH	2,094±.030	2,5	.094	.219	.010
	B	Right	DTF2-2RN-RH	52,07±1,0	11,2	3,59	3,96	1,53
		Left	DTF2-2RN-LH	2,050±.040	2,5	.141	.156	.060

ROLLER PLUNGER ACTUATED SWITCHES



Without seal boot, right-hand actuator

ORDER GUIDE

Description	Elec. Rating	Actuator Position†	Catalog Listing	O.P. mm in.	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
Without seal boot. Field adjustable 360° horizontally.	D	Right	BAF1-2RQ9-RH	64,69	11,1	2,39	3,96	0,25
		Left	BAF1-2RQ9-LH	2,547	2,5	.094	.156	.010
	B	Right	BAF1-2RQN8-RH	64,69	35,6	3,18	4,75	0,19
		Left	BAF1-2RQN8-LH	2,547	8	.125	.187	.0075

FLEXIBLE ROD ACTUATED SWITCHES



With seal boot, right-hand actuator

ORDER GUIDE

Description	Elec. Rating	Actuator Position†	Catalog Listing	P.T. max.
With seal boot. Operates from any direction, except direct pull. SPDT.	D	Right	BAF1-2RN18-RH	15°
		Left	BAF1-2RN18-LH	

N = Newtons
† When looking at nameplate.

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel; O.P. — Operating Position

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

Limit and Enclosed Switches

BAF1 Series

High Capacity Enclosed Switches

ROLLER LEVER ACTUATED SWITCHES



With seal boot,
right-hand actuator

ORDER GUIDE

Description	Elec. Rating	Actuator Position†	Catalog Listing	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot. Field adjustable 360° horizontally and 225° vertically.	SPDT	Right	BAF1-2RN2-RH	8,90	5,56	6,35	0,51
		Left	BAF1-2RN2-LH	2	.219	.250	.020
	DPDT	Right	DTF2-2RN2-RH	11,1	7,93	5,56	3,05
		Left	DTF2-2RN2-LH	2.5	.312	.219	.120

ONE-WAY ROLLER LEVER ACTUATED SWITCHES



With seal boot
right-hand actuator

ORDER GUIDE

Description	Elec. Rating	Actuator Position†	Catalog Listing	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
With seal boot. Field adjustable 360° horizontally and 180° vertically. SPDT.	D	Right	BAF1-2RN28-RH	8,90	5,56	6,35	0,51
		Left	BAF1-2RN28-LH	2	.219	.250	.020

MANUALLY ACTUATED SWITCHES



With seal boot,
right-hand actuator

ORDER GUIDE

Has 1.5 inch (38,1 mm) diameter button.

Description	Elec. Rating	Actuator Position†	Catalog Listing	O.F. max. N lbs.
With seal boot. Field adjustable 360° horizontally and 180° vertically. SPDT.	D	Right	BAF1-2RN4-RH	8,90
		Left	BAF1-2RN4-LH	2

MAINTAINED CONTACT (RESET) PLUNGER ACTUATED SWITCHES



With seal boots,
right-hand actuator

ORDER GUIDE

Contact transfer is maintained after either plunger is operated. (Top plunger provides more accurate and uniform characteristics.)

Description	Elec. Rating	Actuator Position†	Catalog Listing	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.
With seal boot on both top and bottom (reset) plungers. SPDT.	D	Right	BAF1-3RNX1	7,79	2,39	4,45
				1.75	.094	.219

N = Newtons
† When looking at nameplate.

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

Limit/Enclosed

Limit and Enclosed Switches
High Capacity Enclosed Switches

BAF1 Series

REPLACEMENT PARTS

Basic Packets include mounting hardware, an insulator, and a cover seal ring. The plunger seal boot and retaining hardware may be ordered separately as 10PA2.

CONDUIT SEALING PACKETS

Table with 2 columns: Catalog Listing Packet, Cable O.D. Inches. Rows include 2PA6, 2PA16, 2PA1 with their respective cable O.D. ranges.

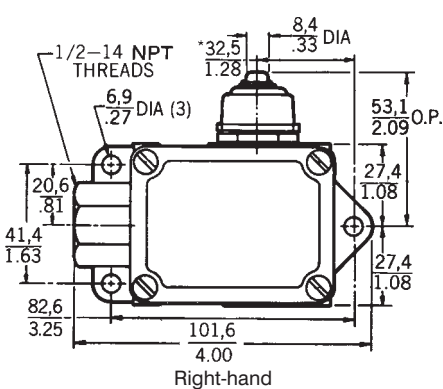
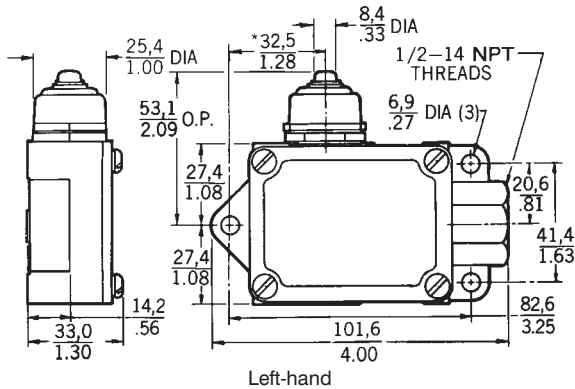
(See page A41 for description.)

Table with 4 columns: Switch Type, Basic Packet, Catalog Listing Replacement Part Numbers Switching Unit*, Actuator. Lists various switch models and their corresponding part numbers.

* Includes basic packet.
** Includes seal boot.

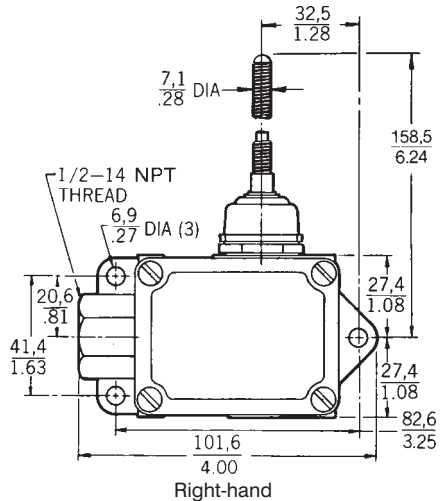
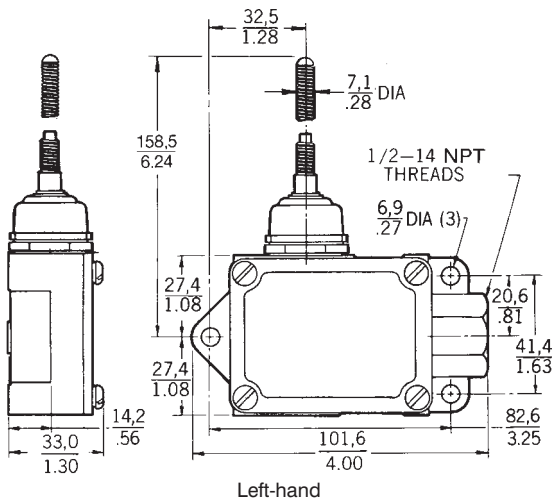
MOUNTING DIMENSIONS (For reference only)

PLUNGER (with seal boot)



*28.2 on DTF2 Types
1.11

COIL SPRING (with seal boot)



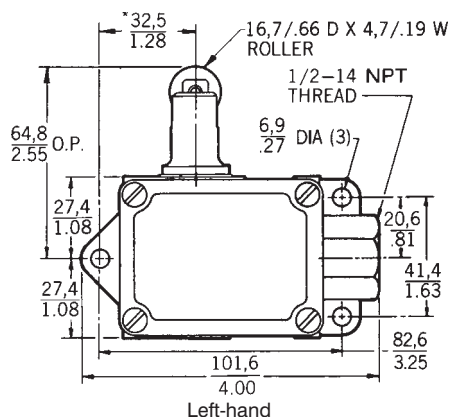
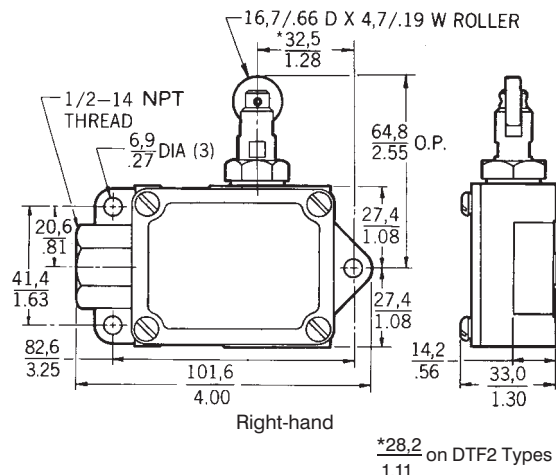
0.0 = mm
Key: 0.00 = inches

High-Capacity Enclosed Switches

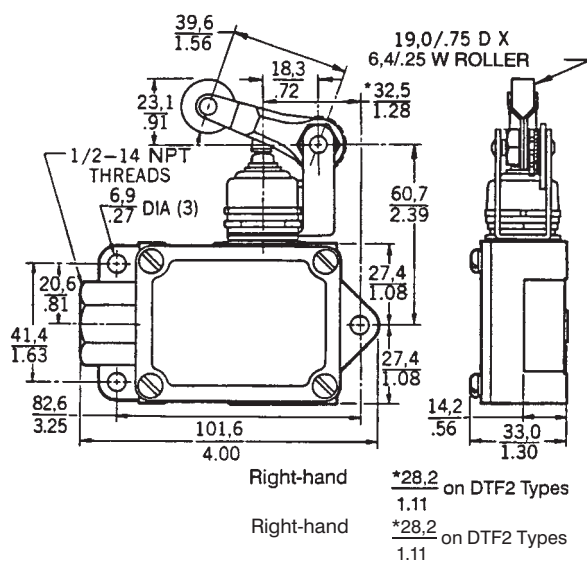
MOUNTING DIMENSIONS (For reference only)

BAF1 Series

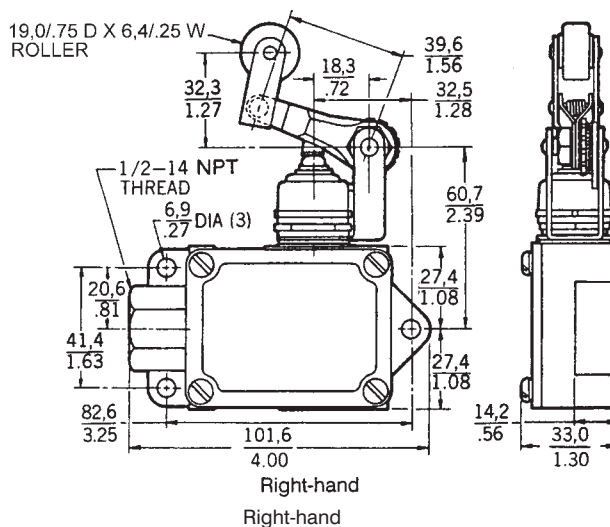
ROLLER PLUNGER (without seal boot)



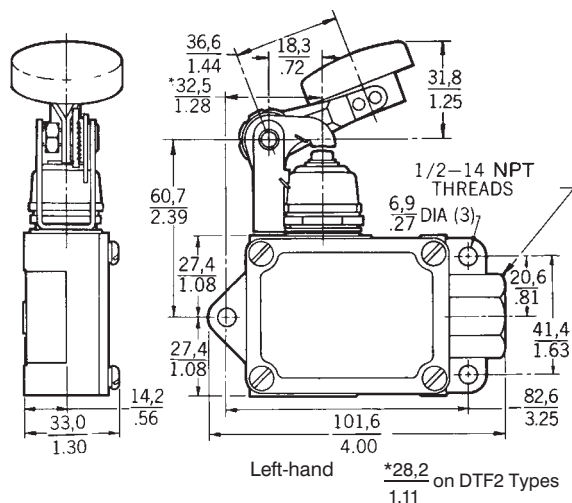
ROLLER LEVER (with seal boot)



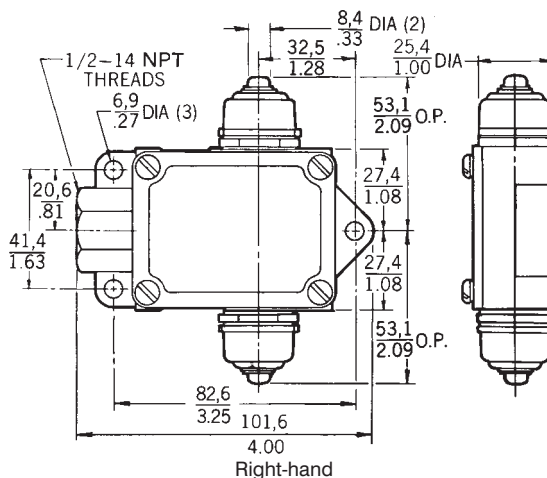
ONE-WAY ROLLER LEVER (with seal boot)



MANUAL (with seal boot)



PLUNGER (Reset) (with seal boot)



Limit/Enclosed

Enclosed Switches



OP enclosed switches are precision snap-action switches sealed in rugged cast aluminum housings. Cover and shaft seals keep out moisture and other contaminants on rotary operated switches. The plungers in the Q-plunger version are not sealed.





Refer to page A123 for explosion-proof Type EX switches, which are dimensionally interchangeable with OP switches.

FEATURES

- Cast aluminum housing
- Mounts from 4 sides
- Cover seal, captive cover screws
- Momentary contact

- UL Recognized, file #E12252
 - CSA Certified, file #LR57325
 - Grounding screw
 - NEMA 1, 3*, 4* and 13*
- (* Except Q-plunger and high temperature types)

ELECTRICAL RATING

Circuitry	Electrical Rating
 Single-pole Double-throw	A UL/CSA Rating: 15 amps, 125, 250 or 480 VAC; 1/8 Hp, 125 VAC; 1/4 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC.
 Double-pole Double-throw	B UL/CSA Rating: 10 amps, 125, 250 VAC; 0.3 amp, 125 VDC; 0.15 amp, 250 VDC.
 Single-pole Double-throw	D UL/CSA Rating: 20 amps, 125, 250 or 480 VAC; 1 Hp, 125 VAC; 2 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC. Lamp Load — 10 amps, 125 VAC.
 Single-pole Double-throw	E 5 amps, 125, 250 or 480 VAC; 1/2 amp - 125VDC; 1/4 amp - 250 VDC

ROLLER LEVER ACTUATED SWITCHES



N = Newtons
 * Actuation is designated as CW (clockwise) or CCW rotation, when looking at the switch nameplate.
 † Choice of levers available for use with OP-AR20:
6PA5-EX (non-sparking roller), **6PA6-OP** (steel roller), **6PA127-EX** (nylon roller), **6PA130-EX** (CW), **6PA142-EX** (CCW), and **6PA136-EX** (Aluminum rod).

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

ORDER GUIDE

Description		Elec. Rating	Catalog Listing	O.F.	P.T. max. mm in.	O.T. max.	D.T. max. mm in.
Roller Lever is field adjustable through 360°	CW actuation* SPDT	A	OP-AR	2,22-5,56 N .5-1.25 lbs.	5,56 .219 (8°)	90°	0,18 .007 (.25°)
	CW actuation* SPDT will withstand 400°F for 100 hours	E	OP-AR400	2,22-5,56 N .5-1.25 lbs.	5,56 .219 (8°)	90°	0,18 .007 (.25°)
	CW actuation* High capacity. SPDT	D	OPA-AR	3,34-8,90 N .75-2 lbs.	5,56 .219 (8°)	25°	0,3 .012 (.4°)
	CW actuation* DPDT	B	OPD-AR	2,22-6,67 N .5-1.5 lbs.	4,78 .250 (10°)	25°	2,77 .109 (4°)
	CCW actuation* SPDT	A	OP-AR30	1,11 N max. 2.5 lbs. max.	1,65 .065 (3.5°)	25°	0,18 .007 (.25°)
	CCW actuation* Basic switch plunger held depressed (normal position) DPDT	B	OPD-AR30	12,2 N max. 2.75 lbs. max.	5,56 .219 (8°)	25°	2,77 .109 (4°)
	CW or CCW actuation* No lever return spring. No mounting bracket furnished. SPDT.	A	OP-AR16	0,56 N max. 2 oz. max.	—	—	—
No lever furnished.† CW actuation.* SPDT		A	OP-AR20	0,08-0,23 N .75-2 in. lb.	8°	90°	.25°

Enclosed Switches

CROSS ROLLER LEVER ACTUATED SWITCH



ORDER GUIDE

Description	Elec. Rating	Catalog Listing	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
CW actuation* Field adjustable through 360°. SPDT	A	OP-CR	2,22-5,56 .5-1.25	5,56 .219 (8°)	90° max.	0,18 .007 (.25°)

MANUALLY ACTUATED SWITCH



ORDER GUIDE

Description	Elec. Rating	Catalog Listing	O.F. max.
Large 3x3.5 inch paddle for fast, easy operation SPDT	A	OP-AR50	11.1 Newtons 2.5 lbs. (approx.)

Limit/Enclosed

OVERTRAVEL PLUNGER ACTUATED SWITCHES



ORDER GUIDE

Description		Elec. Rating	Catalog Listing	O.P. mm in.	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
In-line actuation	SPDT	A	OP-Q	47,2±1,52 1.859±.060	13,3 3	1,98 .078	4,78 .188	0,10 .004
	High Capacity SPDT	D	OPA-Q	46±1,52 1.812±.060	8,90 2	1,27 .050	3,18 .125	0,23 .009
	DPDT	B	OPD-Q	46±1,52 1.812±.060	13,3 3	2,77 .109	3,58 .141	1,52 .060

BOOT SEALED PLUNGER ACTUATED SWITCH

ORDER GUIDE

Description	Elec. Rating	Catalog Listing	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
In-line actuation with boot seal	A	OP-N	15,5 3.5	1,98 .078	4,78 .188	0,10 .004

* Clockwise actuation, when looking at the switch nameplate.
N = Newtons

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel; O.P. — Operating Position

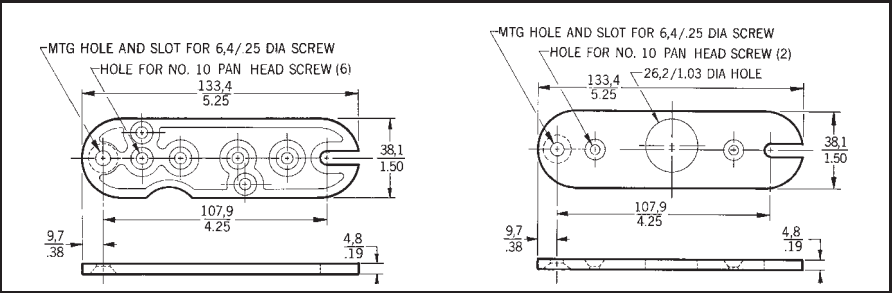
REPLACEMENT PARTS

In addition to the items shown below, these replaceable internal levers are available:
33PA2-OP for OP-AR, OP-AR20 and OP-CR; and
33PA3-OP for OP-AR50.

Switch Listing	Catalog Listing Replacement Part Numbers		
	Switching Unit	Actuator	Springs
OP-AR	BZ-2R-P4	6PA6-OP	33PA7-EX
OPA-AR	BA-2R-P4	6PA6-OP	33PA6-EX
OPD-AR	DT-2R4-A7	6PA6-OP	33PA6-EX
OP-AR30	BZ-2R-P4	6PA6-OP	33PA5-EX
OPD-AR30	DT-2R711-A7	6PA6-OP	33PA5-EX
OP-AR16	BZ-2RW88-P5	6PA6-OP	—
OP-AR20	BZ-2R-P4	†	33PA7-EX
OP-Q	BZ-2R-P4	8PA7-OP	—
OPA-Q	BA-2R-P4	—	—
OPD-Q	DT-2R-A7	—	—
OP-CR	BZ-2R-P4	6PA131-EX	33PA7-EX
OP-AR50	BZ-2R-P4	6PA134-OP	33PA7-EX

† Levers for OP-AR20 are on pages A108 and A109.

MOUNTING BRACKETS



15PA85-EX is used for top, bottom, back or end mounting. It is furnished with each switch, except OP-AR16 and OP-AR62.

15AP86-EX is ordered separately for top mounting of plunger switches.

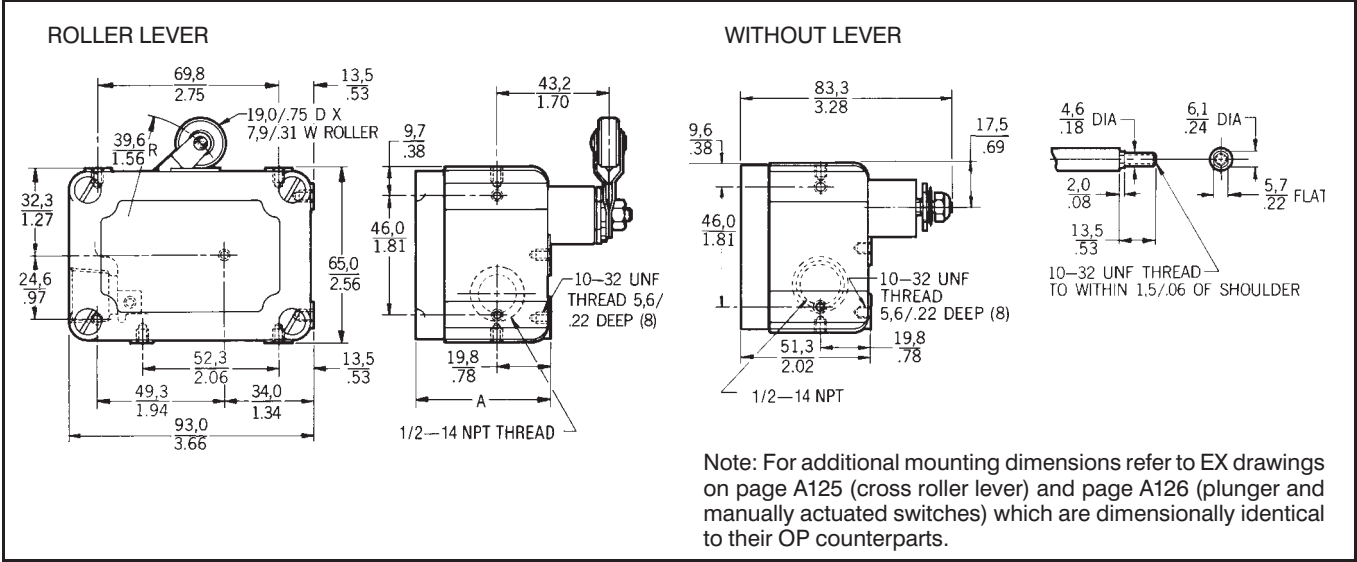
(Switches may also be direct mounted using 10-32 NF screws.)

CONDUIT SEALING PACKETS

Catalog Listing Packet	Cable O.D. Inches
2PA6	.400" – .435"
2PA16	.435" – .470"
2PA1	.530" – .570"

(See page A99 for description.)

MOUNTING DIMENSIONS (For reference only)



LN Series



- LN switches are designed to withstand rapid hammer-blow actuation. Impact on the actuating plunger cannot reach the precision switch unit inside. Individual seals around each leadwire and cover plate protect switch cavity from condensate, oil and dust.

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

Circuitry	Electrical Rating
 <p>Single-pole Double-throw</p>	<p>A</p> <p>UL/CSA Rating: 15 amps, 125, 250 or 480 VAC; ⅛ Hp, 125 VAC; ¼ Hp, 250 VAC; ½ amp, 125 VDC; ¼ amp, 250 VDC.</p>
 <p>Two-circuit Double-break</p>	<p>E</p> <p>UL Rating: 10 amps, 125 or 250 VAC; ½ Hp, 125 VAC.</p>

Limit/Enclosed

Left-hand actuator

Elec. Rating	Catalog Listing		Lead Length*	O.P. mm in.	O.F. max. N lbs.	P.T. mm in.	O.T. min. mm in.	D.T. max. mm in.
	Right-Hand	Left-Hand						
A	BZLN-RH	BZLN-LH	1-ft.	41,7 ± 0,10	22,2	0,20-0,51	5,16	0,10
	BZLN-RH5	BZLN-LH5	5-ft.	1.640 ± .004	5	.008-.020	.203	.004
E	1LN1-1-RH		1-ft.	41,0 ± 0,13	26,7	1,57	4,34	0,76
	1LN1-5-RH	1LN1-5-LH	5-ft.	1.615 ± .005	6	.062 max.	.171	.030

Right-hand actuator

Roller arm is field adjustable 260° vertically.

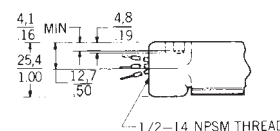
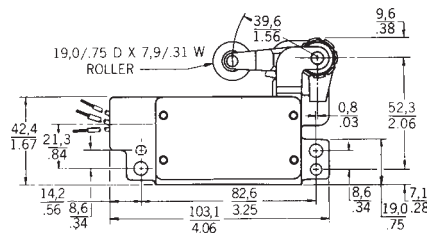
Elec. Rating	Catalog Listing**		Lead Length*	O.F. max. N lbs.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.
	Right-Hand	Left-Hand					
A	BZLN-2-RH	BZLN-2-LH	1-ft.	13,3 3	1,98 .078	11,91 .469	0,36 .014
	BZLN-2-RH5	BZLN-2-LH5	5-ft.				
E	2LN1-3-RH	2LN1-3-LH	3-ft.	13,3 3	3,18 .125	8,74 .344	1,98 .078
	2LN1-5-RH	2LN1-5-LH	5-ft.				

N = Newtons

* In addition to 1-ft. (0,305 m) and 5-ft. (1,524 m), other lead lengths are available.

** Replacement actuators: 6PA4-RH for right-hand, 6PA4-LH for left-hand versions.

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel; O.P. — Operating Positions.

[illegible]

Key: $\frac{0,0 = \text{mm}}{0.00 = \text{inches}}$

Limit and Enclosed Switches

Explosion-Proof Switches

MICRO SWITCH explosion-proof switches contain and cool the escaping hot gases that otherwise could cause an explosion outside the switch. Most of them are UL-CSA listed. Appropriate file reference numbers and copies of the card file are available from your local Branch Office or MICRO SWITCH, Freeport, Illinois.

Switches described on the following pages, except as noted below, are UL listed as follows:

NEMA TYPE 7, CLASS I FLAMMABLE GASES OR VAPORS

Type 7 enclosures are for use indoors in locations classified as Class I, Groups B, C, or D by the National Electrical Code.

Group B — (only switches so noted in the order guides include this listing). Atmospheres containing hydrogen or manufactured gas.

Group C — atmospheres containing diethyl ether, ethylene, or cyclopropane.

Group D — Atmospheres containing gasoline, hexane, butane, naptha, propane, acetone, toluene, or isoprene.

DIVISION 1

Locations in which hazardous agents are present under normal operating conditions.

DIVISION 2

Locations in which hazardous agents may be present only in case of accidental rupture or breakdown.

All MICRO SWITCH listings covered in Division 1 are also covered in the same groups in Division 2.

NEMA TYPE 9, CLASS II COMBUSTIBLE DUSTS

Type 9 enclosures are for use in indoor locations classified as Class II, Groups E, F or G, as defined in the National Electrical Code.

Group E — Atmospheres containing metal dust.

Group F — Atmospheres containing carbon black, coal dust or coke dust.

Group G — Atmospheres containing flour, starch, or grain dust.

MICRO SWITCH™ GSX Series

Explosion-Proof Safety Switch



DESCRIPTION

Honeywell Sensing and Control MICRO SWITCH™ GSX Series Explosion-Proof Safety Switches combines the world-class MICRO SWITCH™ global safety switch (GSS) with our superior explosion-proof housing from our LSX and BX product lines, offering our customers the best of our engineering expertise.

FEATURES

- Snap-action contacts with positive break
- Positive action push plunger breaks current upon opening of door or aperture
- Explosion-proof housing for hazardous locations
- NEMA 1, 3, 4, 12, 13 and IP67 sealing
- cULus, ATEX, IECEx
- Simple installation
- Positive break feature
- Extensive switching options and actuator styles

BENEFITS

- Designed to ensure that even welded contacts will open and the machine will stop in an emergency
- Breaks current upon opening of door or aperture
- Reduces risk that hazardous gases or dusts could cause an explosion
- Meets IECEx standards
- Designed to provide a safe failure mode, ensuring the machine will not start
- Superior sealing for different applications

The positive break feature is designed to provide a safe failure mode, ensuring the machine will not start, and therefore supporting a safer working environment.

The GSX Series safety switch platform allows for over 10,000 actuator and switching option combinations, enabling our customers to source most of their safety and explosion-proof switch requirements from a single, global supplier.

POTENTIAL APPLICATIONS

Gates, doors, access panels or cages on machinery in:

- Hydrocarbon refining
- Chemical processing
- Agricultural equipment
- Food processing
- Grain elevators

MICRO SWITCH™ GSX Series

SPECIFICATIONS

Designation and Utilization Category		Rated Operational Current Ie (A) at Rated Operational Voltage Ue (V)						
		24 V	120 V	240 V	380 V	480 V	500 V	600 V
AC15	A300	—	6 A	3 A	—	—	—	—
AC15	A500	—	6 A	3 A	1,9 A	1,5 A	1,4 A	—
AC15	A600	—	6 A	3 A	1,9 A	1,5 A	1,4 A	1,2 A
DC13	Q300	2,8 A	0,55 A	0,27 A	—	—	—	—

Rated thermal current (Ith)	10 A	Sealing	IP67; NEMA 1, 3, 4, 12, 13
Rated impulse withstand (Uimp)	2500 V	Pollution degree	3
Rated insulation voltage (Ui)	300 V, 500 V, 600 V	Operating temperature range	-40 °C to 70 °C [-40 °F to 158 °F]
Short-circuit protective device (type/maximum rating)	Class J fuse (10 A/600 V)	Expected mechanical life	1,000,000 operations
Conditional short-circuit current	1000 A	—	—

Complies with:

Low Voltage Directive 73/23/EEC, as amended by directive 93/68/EEC.

Machinery Directive 98/37/EEC only as the directives relate to the components being used in a safety function.

IEC/EN60947-1, IEC/EN60947-5-1.

Explosion-Proof Safety Switch

NOMENCLATURE TREE MICRO SWITCH™ GSX Series Nomenclature

GSX	A	16	A	1	B		
Switch type ^(Note 1)	Housing (conduit)		Head		Actuator options		Modifications/ Specials
Explosion-proof positive break series	A 0.5 in NPT	01 Snap action, 1NC/1NO	A Side rotary momentary	1 Std. fixed length roller	A 19 x 6,35 [0.75 x 0.25] nylon roller	1 Clockwise rotation	
	B PG 13.5	03 Slow acting, 1NC/1NO Break before make	B Top pin plunger	3 Yoke roller	C 25,4 x 12,7 [1 x 0.5] nylon roller	2 Cnterclock rotation	
	C 20 mm	04 Slow acting, 1NC/1NO Make before break	C Top roller plunger	5 Offset roller	D 38,1 x 6,35 [1.5 x 0.25] nylon roller	3 Head assb. w/ actuator to right side	
	D PF 1/2	06 Slow acting, 2NC	D Top roller lever		E 19 x 6,35 [0.75 x 0.25] bronze roller	4 Head assb. w/ actuator to left side	
		07 Snap action, 1NC/1NO, gold			W 38,1 x 12,7 [0.75 x 0.5] rubber roller	5 Head assb. w/ actuator to mtg. surf.	
		20 Snap action, 2NC/2NO			Y 50,9 x 12,7 [2.0 x 0.5] rubber roller	6 Roller perpendicular to mounting surface	
		22 Snap action, 2NC/2NO, gold				C Prelead cable	
		33 Slow acting, 1NC/1NO Break before make, gold				Q Connector	
		34 Slow acting, 1NC/1NO Make before break, gold					
		36 Slow acting 2NC, gold					
		40 Slow acting, 4NC					
		41 Slow acting, 4NC, gold					
		42 Slow acting, 2NC/1NO Break before make					
		43 Slow acting, 2NC/1NO Break before make, gold					
		44 Slow acting, 2NC/2NO Break before make					
		45 Slow acting, 2NC/2NO Break before make, gold					
		46 Slow acting, 3NC/1NO Break before make					
		47 Slow acting, 3NC/1NO Break before make, gold					

NOTES

(1) Not all possible combinations are available; these are only guidelines.

NOTES

(1) Not all possible combinations are available; these are only guidelines.

MICRO SWITCH™ GSX Series

Figure 1. Side rotary head with standard roller

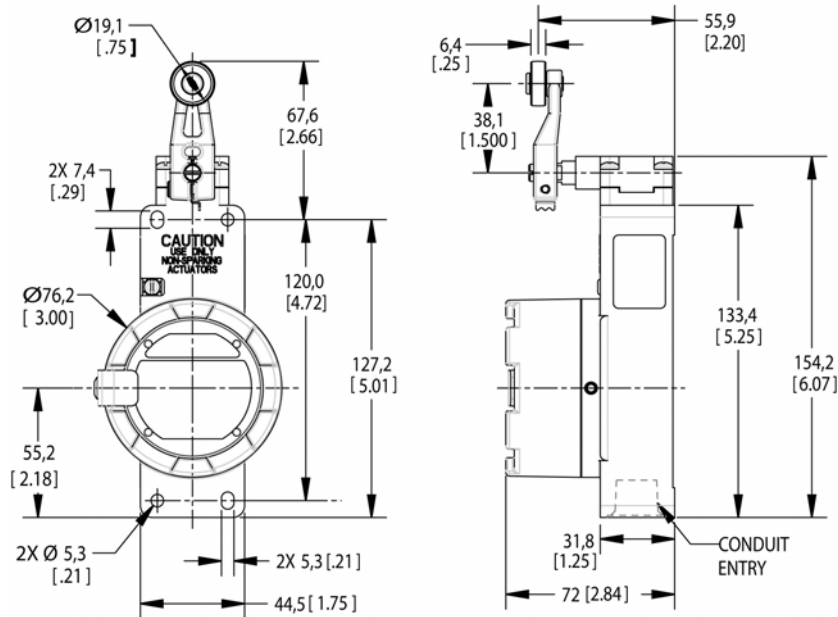


Figure 2. Pin plunger

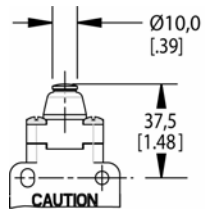


Figure 3. Top roller plunger

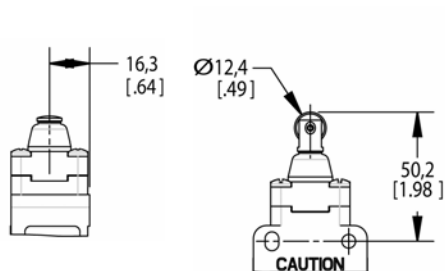
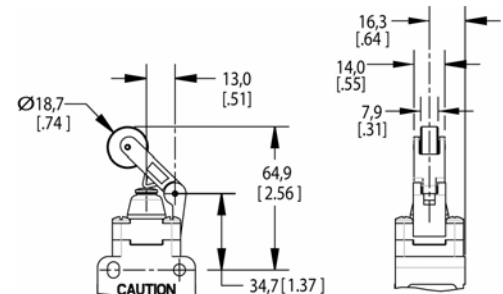


Figure 4. Top roller lever



ORDER GUIDE

Listing	Description
GSXA42A1E	0.5 in NPT housing 2NC/1NO side rotary Ø 0.75 in x 0.25 in bronze roller
GSXA42B	0.5 in NPT housing 2NC/1NO pin plunger
GSXA42C	0.5 in NPT housing 2NC/1NO top roller plunger
GSXA42D	0.5 in NPT housing 2NC/1NO top roller lever
GSXA46A1E	0.5 in NPT housing 3NC/1NO side rotary Ø 0.75 in x 0.25 in bronze roller
GSXA46B	0.5 in NPT housing 3NC/1NO pin plunger
GSXA46C	0.5 in NPT housing 3NC/1NO top roller plunger
GSXA46D	0.5 in NPT housing 3NC/1NO top roller lever
GSXC42A1E	20 mm housing 2NC/1NO side rotary Ø 0.75 in x 0.25 in bronze roller
GSXC42B	20 mm housing 2NC/1NO pin plunger
GSXC42C	20 mm housing 2NC/1NO top roller plunger
GSXC42D	20 mm housing 2NC/1NO top roller lever
GSXC46A1E	20 mm housing 3NC/1NO side rotary Ø 0.75 in x 0.25 in bronze roller
GSXC46B	20 mm housing 3NC/1NO pin plunger
GSXC46C	20 mm housing 3NC/1NO top roller plunger
GSXC46D	20 mm housing 3NC/1NO top roller lever



WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.



WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other**

warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

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Sensing and Control

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Honeywell

MICRO SWITCH™ BX/BX2 Series

Hazardous Area Switches



DESCRIPTION

The MICRO SWITCH™ BX/BX2 Series is ideal for outdoor use or in adverse environments where a combination of explosion proof plus sealing requirements are needed. To comply with explosion-proof requirements the BX/BX2 has flame paths within the housing, which cool exploding gases below the ignition temperature before they reach explosive gases surrounding the housing. Flame paths on the BX/BX2 are (1) an extended plunger between the switch cavity and head and (2) the cover-housing threads on the front of the switch.

While the MICRO SWITCH™ BX Series features an aluminum housing, the MICRO SWITCH™ BX2 Series has a 316L stainless steel housing that provides enhanced corrosion resistance in applications exposed to aggressive, caustic agents, as well as those often present in chemical processing plants, off-shore/near-shore sites, and other hazardous areas.

These products are weather sealed for outdoor use and designed for explosive gas/dust environments. The BX/BX2 Series is directly interchangeable with the LSX. Adapter plate not required. All heads are field adjustable at 90° increments.

Honeywell explosion-proof switches are designed specifically for use in hazardous location applications. The BX/BX2 enclosure is sealed for protection against corrosion, water, dust and oil as defined in IEC60529. The temperature

rating for these products depends upon the seal material used. Products using a fluorosilicone seal have a rating of -40 °C to 70 °C [-40 °F to 158 °F]. Products using a fluorocarbon seal have a rating of -12 °C [10 °F] to 70 °C [158 °F]. These enclosures meet Ex d IIC T6, Ta -40 °C to 70 °C and Ta -12 °C to 70 °C, respectively. As well as Ex d tD A21 IP67 T85 °C. SIRA 00ATEX1037X and IECEx SIR 07.0102X.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-0:2006, EN 60079-1:2007, EN 61241-0:2004, EN 61241-0:2006, IEC 60079-0:2004 4th Ed., IEC 60079-0:2007 6th Ed., IEC 61241-0:2004 1st Ed., and IEC 61241-1:2004 1st Ed. The maximum construction gap (ic) is less than that required by Table 2 of EN/IEC60079-1:2007, clause 5.2.2 as detailed below.

Flame path	Max. gap	Comment
Push rod & bearing	0,076 mm	Cylindrical spigot joint

All BX2 conduit types and BX products with conduit types 1/2-14NPT, 3/4-14NPT also meet the North American Hazardous Locations Designation: NEMA 7 - Class I, Groups B, C and D; NEMA 9 - Class II, Groups E, F and G and comply with UL Standard: UL 894.

FEATURES






- BX (M20, PG13.5, or PF1/2 conduit): ATEX and IEC Ex
- BX (1/2-14 NPT, 3/4-14 NPT): UL, CSA, ATEX, IEC Ex
- BX2: UL, cUL, ATEX IEC Ex
- BX/BX2: IP67; NEMA 1, 3, 4, 6, 13
- BX (1/2-14 NPT, 3/4-14 NPT) and BX2: NEMA 7, 9 (Div. 1, Class I, Groups B, C, & D Div 1, Class II, Groups E, F, & G)
- BX/BX2: II 2 G; Ex d IIC T6 • II 2 D; Ex d tD A21 T85°C
- Choice of housing: aluminum or 316L stainless steel
- Diverse conduit selection for wide range of applications
- Variety of heads and non-sparking actuators
- 10 A continuous carry electrical rating
- Choice of silver or gold contacts
- External and internal grounding screw
- Fluorocarbon and low-temperature sealing

POTENTIAL APPLICATIONS

- Control valves and actuators
- Offshore drilling
- Grain elevators
- Petrochemical plants
- Chemical plants
- Waste treatment
- Paint booths
- Mining conveyors
- Pulp and paper coating
- Hazardous waste handling





MICRO SWITCH™ BX/BX2 Series

SELECTION GUIDE

Features					
	BX4A3K	BX24A3K	BX4A3K-1A	BX24A3K-1A	BX24P4L
Description	Side rotary, momentary, no lever, 1NO/1NC		Side rotary, momentary, with lever, 1NO/1NC		Side rotary, momentary, low pre-travel, 2NO/2NC
Actuator	Lever not included - reference lever required accessory		1.5 in fixed length lever with front mounted nylon roller (.75 in dia. x .25 in wide)		Lever not included - reference lever required accessory
Conduit Thread	20 mm conduit		20 mm conduit		20 mm conduit
Circuitry	1NC 1NO single-pole double-throw, snap-action, double-break		1NC 1NO single-pole double-throw, snap-action, double-break		2NO 2 NC double-pole double-throw, snap-action, double-break
Approvals	ATEX, IEC Ex	UL, cUL, ATEX IEC Ex	ATEX, IEC Ex	UL, cUL, ATEX IEC Ex	UL, cUL, ATEX, IEC Ex
Actuator	Side rotary		Side rotary		Side rotary
Pretravel	15°		15°		9°
Overtravel	60°		60°		68°
Differential Travel	5°		5°		4°
Operating Torque	0,45 N m max. [4 in-lb max.]				
UL File #	—		—		—
CSA File #	—		—		—
Sealing	IP67; NEMA 1, 3, 4, 6, 13	IP67; NEMA 1, 3, 4, 6, 7, 9, 13	IP67; NEMA 1, 3, 4, 6, 13	IP67; NEMA 1, 3, 4, 6, 7, 9, 13	IP67; NEMA 1, 3, 4, 6, 7, 9, 13
Product Type	Weather-sealed, explosion-proof limit switches/IEC Ex approvals				
Ampere Rating	10 A (Thermal)				
Supply Voltage	600 Vac and 250 Vdc max.				
Operating Temperature Range	-40 °C to 70 °C [-40 °F to 158 °F]				
Housing Material	Aluminum (BX Series); 316L Stainless Steel (BX2 Series)				
Housing Type	BX non plug-in				
Sealed	Explosion-proof				
Availability	Global				
Agency Approvals and Standards	<ul style="list-style-type: none">• BX (M20, PG13.5, or PF1/2 conduit): ATEX and IEC Ex• BX (1/2-14 NPT, 3/4-14 NPT): UL, CSA, ATEX, IEC Ex• BX2: UL, cUL, ATEX IEC Ex• BX/BX2: IP67; NEMA 1, 3, 4, 6, 13• BX (1/2-14 NPT, 3/4-14 NPT) and BX2: NEMA 7, 9 (Div. 1, Class I, Groups B, C, & D Div 1, Class II, Groups E, F, & G• BX/BX2: II 2 G; Ex d IIC T6 • II 2 D; Ex d tD A21 T85°C)				







Hazardous Area Switches

SELECTION GUIDE

Features				
	BX4D3K	BX4C3K	BX24C4L	BXA4L
Description	Top roller plunger, 1NO/1NC	Top plunger plain, 1NC/1NC	Top plunger plain, 2NO/2NC	Side rotary, momentary, no lever, 2NO/2NC
Actuator	N/A	N/A		Lever not included - reference lever required accessory
Conduit Thread	20mm conduit	20 mm conduit		3/4 in - 14NPT conduit
Circuitry	1NC 1NO single-pole double-throw, snap-action, double-break	1NC 1NO single-pole double-throw, snap-action, double-break	2NO 2 NC double-pole double-throw, snap-action, double-break	2NC 2NO single-pole double-throw, snap-Action, double-break
Approvals	ATEX, IEC Ex	ATEX, IEC Ex	UL, cUL, ATEX IEC Ex	UL, CSA, ATEX, IEC Ex
Actuator	Top roller plunger	Top plunger		Side rotary
Pretravel	1,78 mm [0.070 in]	1,78 mm [0.070 in]		15°
Overtravel	4,83 mm [0.190 in]	4,83 mm [0.190 in]		60°
Differential Travel	0,38 mm [0.015 in]	0,38 mm [0.015 in]	0,51 mm [0.020 in]	7°
Operating Position	68.6 mm ± 1 mm [2.700 in ± 0.040 in]	58.5 mm ± 0.76 mm [2.305 in ± 0.030 in]		—
Operating Torque	—	—		0,45 N m max. [4 in-lb max.]
Operating Force	0,45 N max. [4 lb max.]	0,45 N max. [4 lb max.]		—
UL File#	—	—		E61730
CSA File #	—	—		LR57327
Sealing	IP67; NEMA 1, 3, 4, 6, 13	IP67; NEMA 1, 3, 4, 6, 13	IP67; NEMA 1, 3, 4, 6, 7, 9, 13	IP67; NEMA 1, 3, 4, 6, 7, 9, 13
Product Type	Weather-sealed, explosion-proof limit switches/IEC Ex approvals			
Ampere Rating	10 A (Thermal)			
Supply Voltage	600 Vac and 250 Vdc max.			
Operating Temperature Range	-40 °C to 70 °C [-40 °F to 158 °F]			
Housing Material	Aluminum (BX Series); 316L Stainless Steel (BX2 Series)			
Housing Type	BX non-plug-in			
Sealed	Explosion-proof			
Availability	Global			
Agency Approvals and Standards	<ul style="list-style-type: none"> • BX (M20, PG13.5, or PF1/2 conduit): ATEX and IEC Ex • BX (1/2-14 NPT, 3/4-14 NPT): UL, CSA, ATEX, IEC Ex • BX2: UL, cUL, ATEX IEC Ex • BX/BX2: IP67; NEMA 1, 3, 4, 6, 13 • BX (1/2-14 NPT, 3/4-14 NPT) and BX2: NEMA 7, 9 (Div. 1, Class I, Groups B, C, & D Div 1, Class II, Groups E, F, & G) • BX/BX2: II 2 G; Ex d IIC T6 • II 2 D; Ex d tD A21 T85°C 			

MICRO SWITCH™ BX/BX2 Series

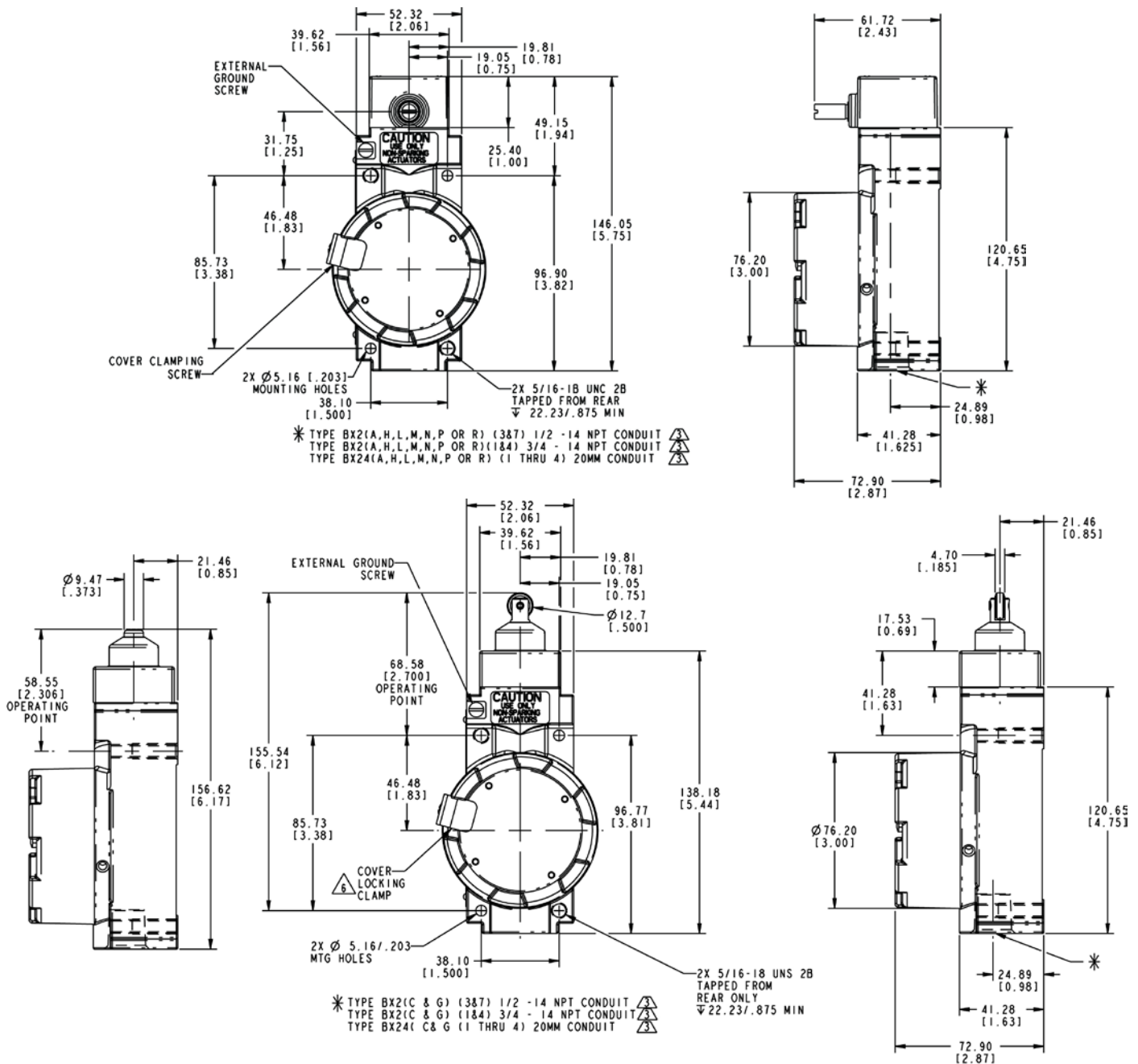
SELECTION GUIDE

						
Features	BXP4L	BX2P4L	BXA3K	BX2A3K	BXC4L	BX2C4L
Description	Side rotary, momentary, low pre-travel, 2NO/2NC		Side rotary, momentary, no lever, 1NO/1NC		Top plunger plain, 2NO/2NC	
Actuator	Lever not included - reference lever required accessory		Lever not included - reference lever required accessory		N/A	
Conduit Thread	3/4 in - 14NPT conduit		1/2 in - 14NPT conduit		3/4 in - 14NPT conduit	
Circuitry	2NO 2 NC double-pole double-throw, snap-action, double-break		1NC 1NO single-pole double-throw, snap-action, double-break		2NO 2 NC double-pole double-throw, snap-action, double-break	
Approvals	UL, CSA, ATEX, IEC Ex	UL, cUL, ATEX IEC Ex	UL, CSA, ATEX, IEC Ex	UL, cUL, ATEX IEC Ex	UL, CSA, ATEX, IEC Ex	UL, cUL, ATEX IEC Ex
Actuator	Side rotary		Side rotary		Top plunger	
Pretravel	9°		15°		1,78 mm [0.070 in]	
Overtravel	68°		60°		4,83 mm [0.190 in]	
Differential Travel (D.T.)	4°		5°		0,51 mm [0.020 in]	
Operating Position	—		—		58.5 mm ± 0.76 mm [2.305 in ± 0.030 in]	
Operating Force	—		—		0,45 N max. [4 lb max.]	
Operating Torque	0,45 N m max. [4 in-lb max.]					
UL File #	—		E61730	—	—	
CSA File #	—		LR57327	—	—	
Sealing	IP67; NEMA 1, 3, 4, 6, 7, 9, 13		IP67; NEMA 1, 3, 4, 6, 7, 9, 13		IP67; NEMA 1, 3, 4, 6, 7, 9, 13	
Product Type	Weather-sealed, explosion-proof limit switches/IEC Ex approvals					
Ampere Rating	10 A (Thermal)					
Supply Voltage	600 Vac and 250 Vdc max.					
Operating Temperature Range	-40 °C to 70 °C [-40 °F to 158 °F]					
Housing Material	Aluminum (BX Series); 316L Stainless Steel (BX2 Series)					
Housing Type	BX non plug-in					
Sealed	Explosion-proof					
Operating Force (O.F.)	0,45 N max. [4 in lb max.]					
Availability	Global					
Agency Approvals and Standards	<ul style="list-style-type: none">• BX (M20, PG13.5, or PF1/2 conduit): ATEX and IEC Ex• BX (1/2-14 NPT, 3/4-14 NPT): UL, CSA, ATEX, IEC Ex• BX2: UL, cUL, ATEX IEC Ex• BX/BX2: IP67; NEMA 1, 3, 4, 6, 13• BX (1/2-14 NPT, 3/4-14 NPT) and BX2: NEMA 7, 9 (Div. 1, Class I, Groups B, C, & D Div 1, Class II, Groups E, F, & G)• BX/BX2: II 2 G; Ex d IIC T6 • II 2 D; Ex d tD A21 T85°C					

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com






MICRO SWITCH™ BX/BX2 Series



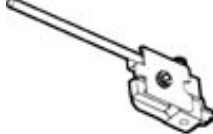


BX2 MOUNTING DIMENSIONS (For reference only) mm/in


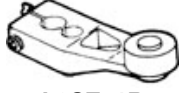



Conduit sizes 1/2-14NPT, 3/4-14NPT, M20, PG13.5, PF1/2 are available for each switch type and carry ATEX and IEC Ex approvals. 1/2-14 NPT, 3/4-14 NPT, and M20 carry UL and CSA approvals
Verify that the mating threaded fitting is identical with the conduit thread shown on the product nameplate

Hazardous Area Switches

BX Levers – Required Accessories					
Lever style	Roller – standard	Roller – standard	Roller – adjustable	Roller – adjustable	Roller – adjustable
Comment	Roller - standard; material: nylon; roller mounted on front of lever	Roller - standard; material: nylon; roller mounted on back of lever	Roller - adjustable; material: nylon; roller mounted on front of lever	Roller - adjustable; material: nylon; roller mounted on front of lever	Roller - adjustable; material: nylon; roller mounted on front of lever
Radius	38,1 mm [1.5 in]	38,1 mm [1.5 in]	38,1 mm to 88,9 mm [1.5 in to 3.5 in]	38,1 mm to 88,9 mm [1.5 in to 3.5 in]	38,1 mm to 88,9 mm [1.5 in to 3.5 in]
Diameter	19,05 mm [0.75 in]	19,05 mm [0.75 in]	19,05 mm [0.75 in]	25,4 mm [1.0 in]	38,1 mm [1.5 in]
Width	6,35 mm [0.25 in]	6,35 mm [0.25 in]	6,35 mm [0.25 in]	12,7 mm [0.5 in]	6,35 mm [0.25 in]
Product type	Lever				
Availability	Global				

BX Levers – Required Accessories					
Lever style	Roller – yoke	Roller – yoke	Rod – standard	Roller with offset	Roller with offset
Comment	Roller - yoke; material: nylon; roller mounted on back-front of lever	Roller - yoke; material: nylon; roller mounted on back-back of lever	Rod - standard; material: aluminum; material: aluminum	Roller - with offset; material: nylon; roller mounted on back of lever	Roller - with offset; material: nylon; roller mounted on front of lever
Radius	38,1 mm [1.5 in]	38,1 mm [1.5 in]	139,7 mm [5.5 in]	38,1 mm [1.5 in]	38,1 mm [1.5 in]
Diameter	19,05 mm [0.75 in]	19,05 mm [0.75 in]	-	19,05 mm [0.75 in]	19,05 mm [0.75 in]
Width	6,35 mm [0.25 in]	6,35 mm [0.25 in]	-	6,35 mm [0.25 in]	6,35 mm [0.25 in]
Product type	Lever				
Availability	Global				

BX2 Levers – Required Accessories			
Lever style	Non-sparking roller – standard	Non-sparking roller – standard	Non-sparking roller – adjustable
Comment	Roller - standard; material: nylon; roller mounted on front of lever	Roller - standard; material: nylon; roller mounted on back of lever	Roller - adjustable; material: nylon; roller mounted on front of lever
Radius	38,1 mm [1.5 in]	38,1 mm [1.5 in]	38,1 mm to 88,9 mm [1.5 in to 3.5 in]
Diameter	19,05 mm [0.75 in]	40,38 mm [1.59 in]	19,05 mm [0.75 in]
Width	12,7 mm [0.5 in]	6,35 mm [0.25 in]	6,35 mm [0.25 in]
Product type	Lever		
Availability	Global		

WARNING

IF USED IN APPLICATIONS CONCERNING HUMAN SAFETY

- Use only NC direct opening ("positive opening"/"positive break") contacts, identified by the symbol.
- Do NOT use flexible/adjustable actuators. Only use actuators designed for safety applications.
- Do NOT defeat, tamper, remove, or bypass this switch.
- Hazardous voltage, disconnect power before servicing
- Strictly adhere to all installation and maintenance instructions
- Consult with local safety agencies and their requirements when designing a machine-control link, interface and all control elements that affect safety.

Failure to comply with these instructions could result in death or serious injury.

WARNING

OPENING PRODUCTS HAZARD

DO NOT OPEN these products when energized or in a flammable gas atmosphere.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

WARNING

IMPROPER CONDUIT THREAD USE

DO NOT USE any other conduit thread than the one identified on the product. Verify that the mating threaded fitting is identical with the conduit thread shown on the product nameplate.

Failure to comply with these instructions could result in death or serious injury.

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

Phone and Fax:

Asia Pacific	+65 6355-2828
	+65 6445-3033 Fax
Europe	+44 (0) 1698 481481
	+44 (0) 1698 481676 Fax
Latin America	+1-305-805-8188
	+1-305-883-8257 Fax
USA/Canada	+1-800-537-6945
	+1-815-235-6847
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Honeywell

Limit and Enclosed Switches

Weather-Sealed Explosion-Proof Switches

LSX Series



LSX switches are for use either indoors or outdoors in hazardous atmospheres as they are a completely sealed explosion-proof device. Mounting hole location and tracking is same as the long established MICRO SWITCH ML-E1 explosion-proof switch.

An optional mounting plate provides the same tracking and mounting as the standard HDLS. The majority of HDLS operating heads and circuitry options are available on the LSX.

Standard HDLS levers are used, but because of explosion-proof requirements, only nylon rollers or other non-sparking material can be selected. Plunger and cat whisker types listed in the LSX order guide are of non-sparking material.

SEALS

Application proven HDLS head seals are retained to seal the top of the LSX. The circular cover on the front is easily unscrewed to expose the switching elements for wiring or replacement. A screwdriver or bar used on the wrenching lugs extending from the front of the cover allows easy removal or tightening. An O-ring seal is located between the housing and cover.

The LSX withstands pressure of an internal explosion and cools the exploding gases below the kindling temperature of the explosive atmosphere. Flame paths are provided by the cover-housing threads and an extended plunger between the switch cavity and head.

FEATURES

- Sealing - applicable portions of NEMA 1, 3, 4, 6, 7, 9, and 13.
- Tracking interchangeability with MICRO SWITCH ML-E1 and HDLS.
- Variety of heads and non-sparking actuators.
- Field adjustability matches switch to application.
- Momentary, maintained, random sequence, or center neutral action.
- 10 amps continuous carry electrical rating.
- Choice of silver or gold contacts.
- ½ or ¾ inch conduit opening.
- UL Listed, file #E61730
- CSA Certified, file #LR57327
- Internal grounding screw.

NEMA standards: 1, 3, 4, 6, 7, 9 and 13. UL listed and CSA certified: Class I, Div. 1, Groups B, C and D. Class II, Div. 1, Groups E, F and G.

Limit/Enclosed

Limit and Enclosed Switches

Weather-Sealed Explosion-Proof Switches

LSX Series

HOW TO ORDER

The order guide shows the option codes which are added to the LSX prefix to specify the operating head, body and circuitry, assembly modifications (if desired) and actuator type.

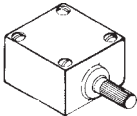
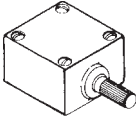
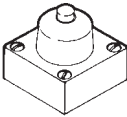
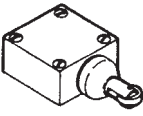
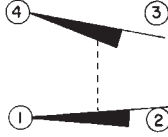
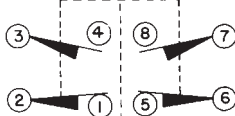
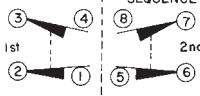
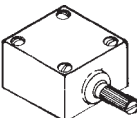
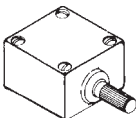
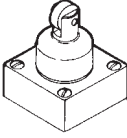
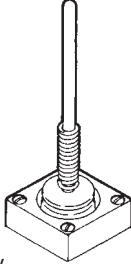

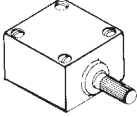
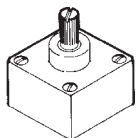
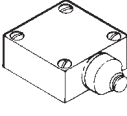
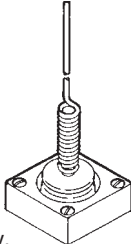
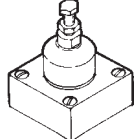
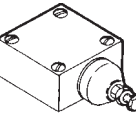
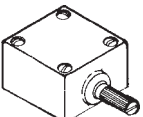
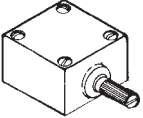
The example given below is LSXA3K-1A. This is an explosion-proof LSX switch with the standard side rotary momentary-action head (A), single-pole circuitry and ½ in. conduit opening (3K). Since no modification codes are listed, it is adjusted for both clockwise (CW) and counterclockwise (CCW)

operation, with the actuator shaft facing the front (label side) of the switch. The actuator (-1A) is in a 1.5 in. lever with a .75 in. nylon roller on the open side. There are list price adders for double-pole circuitry and the actuators. (Levers may also be ordered separately by specifying the LSX listings shown in the actuator code description.)

ORDER GUIDE

LSX standard weather-sealed explosion-proof switch.

Typical Catalog Listing: **LSX**

Head Code				Body and Contacts Circuitry Code		
A*  Side rotary. Momentary.	H  Side rotary. Low differential travel and low torque. Momentary.	C  Top plunger. Momentary.	F*  Side roller plunger. Momentary.	3K Silver 3E Gold plated MOMENTARY  Single-pole, 1 N.O., 1 N.C., ½ in. conduit.† 4K ¾ in. conduit† 4L Silver 4S Gold plated MOMENTARY  Double-pole, 2 N.O., 2 N.C., ¾ in. conduit.† 7L Silver ½ in. conduit† 7S Gold plated 3N SPNC Direct Acting	4M Silver 4T Gold plated SEQUENCE  Sequential. Pole 1 operates before Pole 2 (CW, CCW or both). ¾ in. conduit.† 7T Gold plated ½ in. conduit.	
P  Side rotary. Low differential travel. Momentary.	N*  Side rotary. Maintained contact.	D  Top roller plunger. Momentary.	J  Wobble stick. Momentary.			4N Silver 4U Gold plated CENTER NEUTRAL  Center neutral. Pole 1 operates CCW, Pole 2 operates CW. ¾ in. conduit.† 7U Gold contacts ½ in. conduit
R*  Side rotary. Low torque. Momentary.	B*  Top rotary. Momentary.	E*  Side plunger. Momentary.	K  Cat whisker. Momentary.			
V  Adjustable top plunger. Momentary.	W*  Adjustable side plunger. Momentary.	L  Side rotary. Sequence operation.				
		M  Side rotary. Center neutral.				

* Available with a Single Pole N.C. Direct Acting contact. Electrical Rating D. To order, use 3N for body and circuitry code.

Only

Limit and Enclosed Switches

Weather-Sealed Explosion-Proof Switches

LSX Series

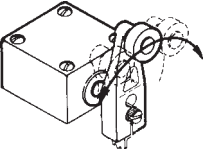
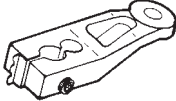
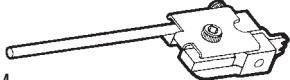
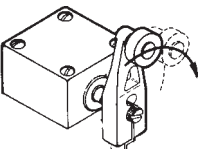
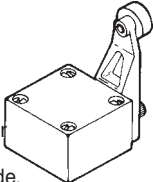
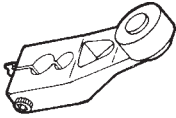
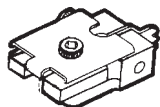
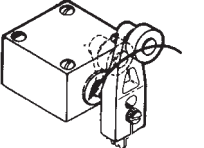
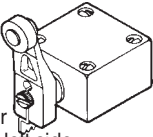
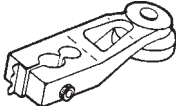
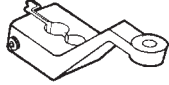
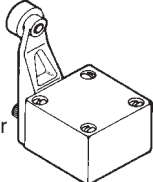
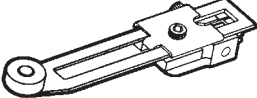
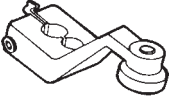
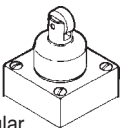
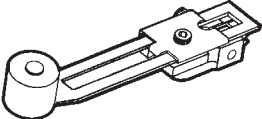
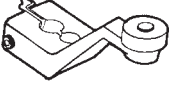
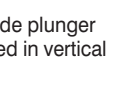
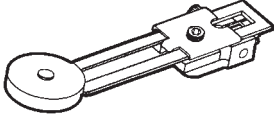
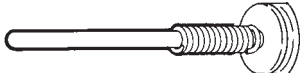
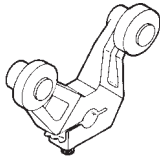

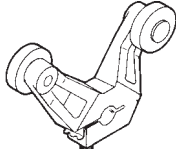
ELECTRICAL RATINGS
Same as HDLS, see page A34.

OPERATING CHARACTERISTICS
See next page.

TEMPERATURE RATINGS
Same as HDLS, see page A56.

ENVIRONMENTAL SEAL PERFORMANCE
Same as HDLS, see page A56.

LOW TEMPERATURE and HIGH TEMPERATURE SEALED
See next page.

Actuator Direction Modification Code (No additional cost.)		Head/Actuator Orientation Modification Code (No additional cost.)		1A Actuator Code	
No Code.  CW and CCW. (Head types A, B, H, L, P, R.)		No Code. Side rotary heads assembled with actuator shaft facing front. Roller on top roller plungers assembled parallel to mounting surface.		1 LSZ51 lever (no roller). 	4M LSZ54M aluminum rod actuator. 
1  CW operation. (Optional with head types A, B, H, L, P, R.)		3 Head assembled with actuator shaft to right side. (Optional with head types A, E, F, H, L, M, N, P, R.) 		1A LSZ51A lever with .75 in. nylon roller on front side. 	4 LSZ54 hub for rod actuator. 
2  CCW operation. (Optional with head types A, B, H, L, P, R.)		4 Head assembled with actuator shaft to left side. (Optional with head types A, E, F, H, L, M, N, P, R.) 		1C LSZ51C lever with nylon roller on back side. 	5 LSZ55 offset lever (no roller). 
		5 Head assembled with actuator shaft to back of switch. (Optional with head types A, E, F, H, L, M, N, P, R.) 		2C LSZ52C adjustable lever (1.5-3.5 in.) with .75 in. nylon roller. 	5A LSZ55A offset lever with .75 in. nylon roller on back side. 
		6 Roller on top roller plungers assembled perpendicular to mounting surface. (Optional with head type D.) 		2J LSZ52J adjustable lever (1.5-3.5 in.) with 1 in. nylon roller. 	5C LSZ55C offset lever with .75 in. nylon roller on front side. 
		8 Roller on side plunger is assembled in vertical position. 		2K LSZ52K adjustable lever (1.5-3.5 in.) with 1.5 in. nylon roller. 	7A Wobble stick actuator. (Use with head type J only.) 
				3S LSZ53S yoke lever with .75 in. nylon rollers (same side). 	8A Cat whisker actuator. (Use with head type K only.) 
				3E LSZ53E yoke lever with .75 in. nylon roller (one ea. side). 	1.5 in. long levers, except where noted.

Limit/Enclosed

Limit and Enclosed Switches

Weather-Sealed Explosion-Proof Switches

LSX Series

OPERATING CHARACTERISTICS

Rotary actuated switches

	Side Rotary											Top Rotary Momentary		
	Momentary								Maintained		Sequence			Center Neutral
	LSXA Standard		LSXP Low Diff. Travel		LSXR Low Torque		LSXH Low Diff. Low Torque		LSXN		LSXL (Double Pole Only)	LSXM (Double Pole Only)	LSXB	
Pretravel max.	15°		9°		15°		9°		65°		1st step 15° 2nd step 10° additional		18°	25°
Overtravel min.	60°		66°		60°		66°		20°		48°		57°	100°
Differential Travel max.	SPDT 5°	DPDT 7°	SPDT 3°	DPDT 4°	SPDT 5°	DPDT 7°	SPDT 3°	DPDT 4°	SPDT 30°	DPDT 35°	5°		10°	SPDT 10° DPDT 12°
Operating Torque max.	0,45 Nm 4 in. lbs.		0,45 Nm 4 in. lbs.		0,19 1.7 in. lbs.		0,19 Nm 1.7 in. lbs.		0,45 Nm 4 in. lbs.		0,45 Nm 4 in. lbs.		0,45 Nm 4 in. lbs.	0,28 Nm 2.5 in. lbs.
Operating Temp. Range	10 to 250°F –12 to 121°C				30 to 250°F –1 to 121°C				10 to 250°F –12 to 121°C			30 to 250°F –1 to 121°C		

Nm = Newton meters

Plunger actuated switches

	Momentary			
	LSXC Top Plunger	LSXD Top Roller Plunger	LSXE Side Plunger	LSXF Side Roller Plunger
Pretravel max.	1,78mm .070 in.	1,78mm .070 in.	2,54mm .100 in.	2,54mm .100 in.
Differential Travel max.	SPDT 0,38mm .015 in. DPDT 0,51mm .020 in.	SPDT 0,38mm .015 in. DPDT 0,51mm .020 in.	1,14mm .045 in.	1,14mm .045 in.
Overtravel min.	4,83mm .190 in.	4,83mm .190 in.	4,83mm .190 in.	4,83mm .190 in.
Operating Force max.	17,8 N 4 lbs.	17,8 N 4 lbs.	26,7 N 6 lbs.	26,7 N 6 lbs.
Operating Point	58,5 ± 0,76mm 2.305 ± .030 in.	68,6 ± 1mm 2.700 ± .040 in.	33,0 ± 0,76mm 1.300 ± .030 in.	44,1 ± 1mm 1.735 ± .040 in.
Operating Temperature Range	–12 to 93°C 10 to 200°F			

Wobble Actuated Switches

	Momentary	
	LSXJ Delrin Rod	LSXK Cat Whisker (Wire)
Pretravel max.	Radius approx. 25,4mm 1.0 in.	50,8mm 2.0 in.
Operating Force max.	2,78 N 10 oz.	1,39 N 5.0 oz.
Operating Temperature Range	–12 to 93°C 10 to 200°F	

N = Newtons

COMPLETELY FLUOROCARBON-SEALED AND LOW TEMPERATURE SWITCHES

Completely fluorocarbon-sealed and low temperature construction LSX switches are available. See page A42 for a full description of both of these options.

How to order
For **fluorocarbon-sealed** switches, insert the additional letters Y and C in the appropriate places in the standard catalog listing; for **low temperature** versions insert the additional letters Y and B. Examples follow:

- LSXA3K—standard side rotary switch
- LSXYAC3K—completely fluorocarbon-sealed version of the LSXA3K
- LSXA3K—standard side rotary switch
- LSXYAB3K—low temperature version of the LSXA3K

Limit and Enclosed Switches

Weather-Sealed Explosion-Proof Switches

LSX Series

REPLACEMENT PARTS

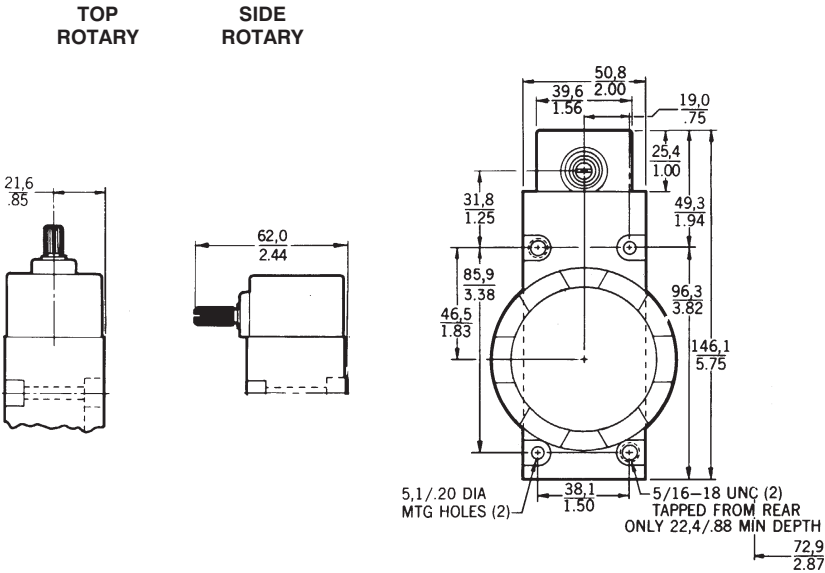
Operating Heads

Switch Type	Catalog Listing Operating Head Only
LSXA	LSZ1A
LSXB	LSZ1B
LSXC	LSXZ1C
LSXD	LSXZ1D
LSXE	LSXZ1E
LSXF	LSXZ1F
LSXH	LSZ1H
LSXJ	LSZ1JGA
LSXK	LSXZ1KHA
LSXL	LSZ1L
LSXM	LSZ1M
LSXN	LSZ1N
LSXP	LSZ1P
LSXR	LSZ1R

Contact Blocks

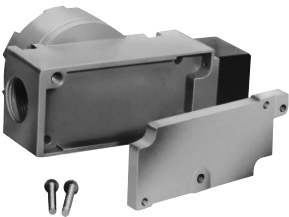
Circuitry	Contact Block
Single Pole	LSXZ3K
Double Pole	LSXZ3L
Sequence or Center Neutral	LSXZ3M

MOUNTING DIMENSIONS (For reference only)



Conduit Openings
(LSXA3, LSXB3, LSXH3, LSXN3,
LSXP3 and LSXR3 have 1/2-14 NPT.
LSXA4, LSXB4, LSXH4, LSXLR,
LSXM4, LSXN4, LSXP4, and LSXR4 have 3/4-14 NPT.

ADAPTER PLATE

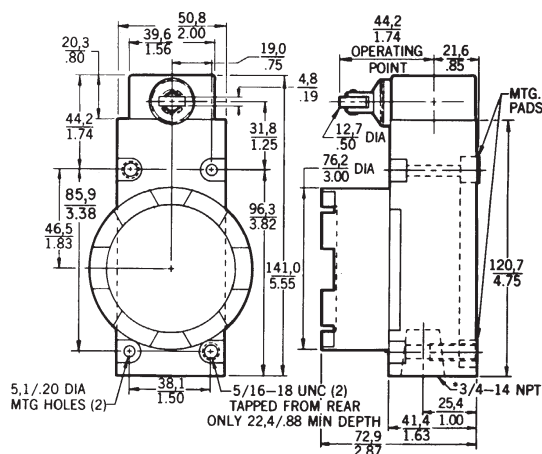


Catalog Listing **LSXZ4022** adapter plate enables the explosion-proof LSX to be mounted on existing HDLS mounting holes. The LSX has a recessed back into which the adapter plate fits and mounts, using two screws (furnished).

Limit/Enclosed

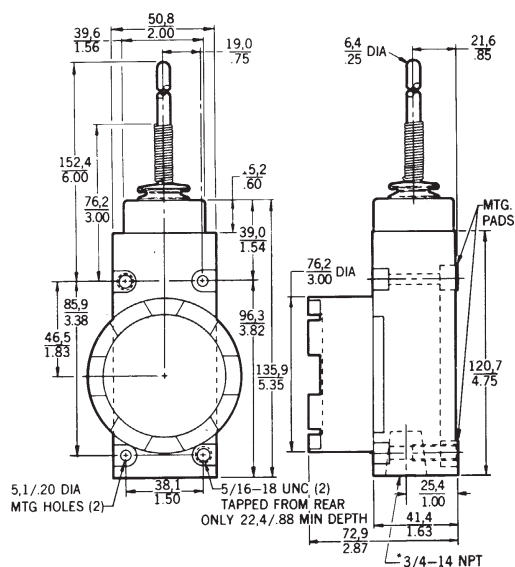
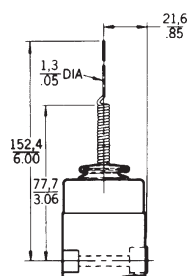
LSX Series

TOP ROLLER PLUNGER



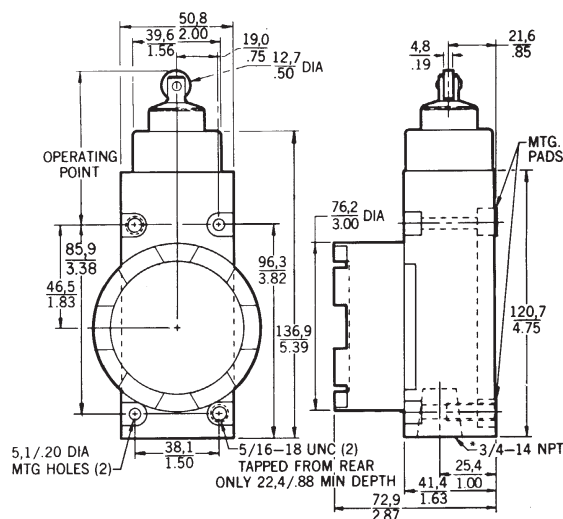
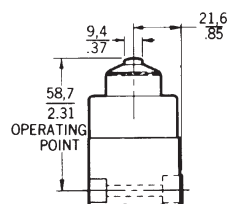
Conduit Openings
(LSXJ3, and LSXK3 have 1/2-14 NPT.)
(LSXJ4 and LSXK4 have 3/4-14 NPT.)

WOBBLE STICK



Conduit Openings
(LSXE3 and LSXF3 have 1/2-14 NPT.
LSXE4 and LSXF4 have 3/4-14 NPT).

TOP ROLLER PLUNGER



Conduit Openings
(LSXC3 and LSXD3 have 1/2-14 NPT.
LSXC4 and LSXD4 have 3/4-14 NPT).

Key: $\frac{0,0 = \text{mm}}{0.00 = \text{inches}}$

Momentary Explosion-Proof Cable Pull Limit Switches: For Signaling Applications



FEATURES

- Optional direct acting contacts enhance reliability
- Cable length may be up to 200 ft. in a straight line
- Sealing meets applicable portions of NEMA 1, 3, 4, 7, 9 and 13
- 10 amps continuous carry electrical rating
- 1/2 or 3/4 inch conduit opening
- UL Listed
- CSA Certified
- Internal grounding screw

NEMA standards: 1, 3, 4, 7, 9 and 13. UL listed and CSA certified: Class I, Div. 1, Groups B, C and D. Class II, Div. 1, Groups E, F and G.

Typical Applications

- Petroleum Plants
- Chemical Plants
- Mining Conveyors

MOMENTARY (CONTACT SWITCH) OPERATING HEAD

Momentary CLSX Cable Pull Limit Switches are designed for signaling applications; they are not to be used as emergency stop devices. (For emergency stop applications, see the Maintained Explosion-Proof Cable Pull Limit Switch in the Safety Products Catalog.)

When using direct acting contacts, Momentary Cable Pull Limit Switches provide a means to manually force disconnection of a normally closed control circuit by pulling on an attached cable. Momentary switches cause contact transfer if the cable is manually pulled and held. When the cable is released, switch contacts return to their original state. Momentary switches have either direct-acting contacts or snap-action contacts.

SEALS

CLSX Switches are for use either indoors or outdoors in hazardous atmospheres as they are a completely sealed explosion-proof device.

Application proven HDLS head seals are retained to seal the top of the CLSX. The circular cover on the front is easily unscrewed to expose the switching elements for wiring or replacement. A screwdriver or bar used on the wrenching lugs extending from the front of the cover allows easy removal or tightening. An O-ring seal is located between the housing and cover.

The CLSX withstands pressure of an internal explosion and cools the exploding gases below the kindling temperature of the explosive atmosphere. Flame paths are provided by the cover-housing threads and an extended plunger between the switch cavity and head.

Limit/Enclosed

Limit and Enclosed Switches

CLSX Series

Momentary Explosion-Proof Cable Pull Limit Switches: For Signaling Applications

TECHNICAL DATA CLSX SERIES SPECIFICATIONS

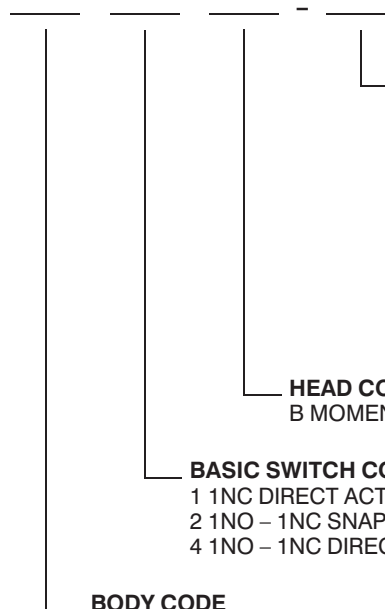
Electrical	
Rate thermal current	$I_{th} = 10 \text{ A}$
Rate insulation voltage	$U_i = 660 \text{ VAC}/660 \text{ VDC}$
Impulse voltage	$U_{imp} = 2.5 \text{ kV}$
Contact resistance	$< 25 \text{ milliohms}$
Operating rating	AC15 $U = 600 \text{ V}; I = 1.2 \text{ A}$ $U = 240 \text{ V}; I = 3 \text{ A}$ $U = 120 \text{ V}; I = 6 \text{ A}$ DC13 $U = 250 \text{ V}; I = 0.27 \text{ A}$ $U = 24 \text{ V}; I = 2.8 \text{ A}$
UL/CSA	A600/Q300
Mechanical	
Protection class	NEMA 1, 3, 4, 7, 9 and 13
Mechanical life	10^5 operations maximum
Temperature Range	-1° to 70°C (30° to 158°F)
Terminal identification	Numbering to EN50013
Head/housing material	Zinc die cast

EXAMPLE CATALOG LISTING

Catalog Listing	Description
B4B-1	Blue Body/Black Head – 1/2" NTP Conduit Tap, 1NO – 1NC Direct Acting, Momentary, Head Assembled with Actuator to the Left

CLSX ORDER GUIDE

CLSX



MODIFICATION CODES (HEAD ORIENTATION)

NO NUMBER INDICATES NO MODIFICATION
1 HEAD ASSEMBLED WITH ACTUATOR TO THE LEFT
2 HEAD ASSEMBLED WITH ACTUATOR TO THE FRONT
3 HEAD ASSEMBLED WITH ACTUATOR TO THE MOUNTING SURFACE

HEAD CODE

B MOMENTARY

BASIC SWITCH CODE

1 1NC DIRECT ACTING
2 1NO – 1NC SNAP ACTION (Monitoring Only)
4 1NO – 1NC DIRECT ACTING

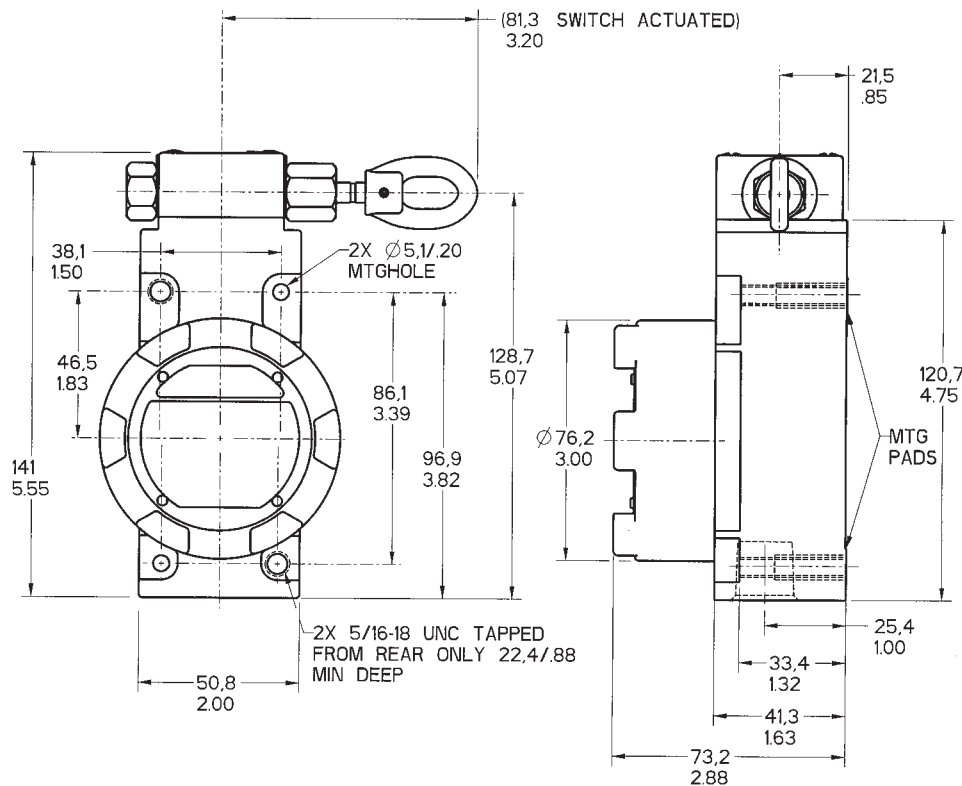
BODY CODE

B BLUE BODY/BLACK HEAD – 1/2" NTP CONDUIT TAP
E BLUE BODY/BLACK HEAD – 3/4" NTP CONDUIT TAP

CLSX SERIES – BASE PRICE

EXPLOSION – PROOF SINGLE HEAD CABLE PULL LIMIT SWITCH

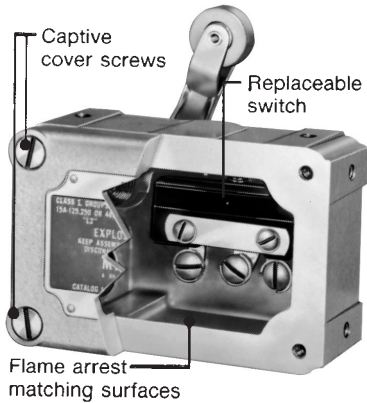
MOUNTING DIMENSIONS (For reference only)



Limit and Enclosed Switches
Explosion-Proof Switches

EX Series

Single-Conduit
Connect Switch*



* See page A124 for double conduit connect switches.

EX switches feature the smallest UL-listed housings available for use in hazardous locations. Flame paths within the housing cool exploding gases below the kindling temperature before they reach the explosive gases surrounding the housing. The enclosed switching unit, which is held in place by screws, is accessible when the cover plate is removed. A tapped conduit

opening is located in one end of one group of EX listings (pages A122-A123); while a second group (page A124) has a conduit opening in each end of the switch. These switches are not sealed against liquids and are not intended to be subjected to liquid splash or for outdoor applications. If a sealed explosion-proof switch is required, refer to the type CX and LSX.

FEATURES

- NEMA 1, 7 and 9
- Compact, rugged housing
- Up to 20 amp capacity
- Ample wiring space
- Mounts from 4 sides
- Roller arms adjustable through 360°
- Non-sparking actuators
- Captive cover screws
- UL Listed, file #E14274
- CSA Certified, file #LR57324
- Grounding screw

NEMA

NEMA standards: 1, 7 and 9. UL listed and CSA certified: Class I, Div. 1, Groups B, C and D (Group B - only as noted in order guides); and Class II, Div. 1, Groups E, F and G.

Also refer to NEMA application note in the Reference Standards section at the rear of this catalog.

TEMPERATURE RANGE

EX switches are for use in a temperature range of -40 to 160°F (-40 to 71°C). For applications outside these limits, please call the 800 number.

ACTUATORS

Roller arm versions are designed for cam or slide operation. Listings include clockwise and counterclockwise actuation. Levers are adjustable through 360°. The roller is non-sparking material. The cross-roller arm switch is for use where the operating mechanism approaches from a direction perpendicular to the longitudinal axis of the switch. The overtravel plunger has a case hardened, radius tipped, push-rod plunger guided by a sturdy bushing. The manually operated switch has a large paddle-shaped actuator.

REPLACEMENT PARTS

Available replacement parts are listed on page A125. An installation sheet packed with each switch describes these parts in detail and explains how they are installed.

ELECTRICAL RATINGS

Circuitry	Electrical Ratings
Single-Pole Double-Throw	A UL/CSA Rating: 15 amps, 125, 250 or 480 VAC; 1/8 Hp, 125 VAC; 1/4 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC.
Single-Pole Double-Throw	B UL/CSA Rating: 20 amps, 125, 250 or 480 VAC; 10 amps, 125 VAC "L"; 1 Hp, 125 VAC; 2 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC.
Double-Pole Double-Throw	C UL/CSA Rating: 10 amps, 125 or 250 VAC; 0.3 amp, 125 VDC; 0.15 amp, 250 VDC.
Single-Pole Double-Throw	D UL/CSA Rating: 10 amps, 125, 250 or 480 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 VDC.
Single-Pole Double-Throw	E UL Rating: 1 amp, 125 VAC.

Limit/Enclosed

Explosion-Proof Switches

ROLLER LEVER ACTUATED SWITCHES



AUXILIARY ACTUATORS

Order rotary actuators for the EX-AR20 from the selection shown below.

ORDER GUIDE

Description		Elec. Rating Pg. A121	Catalog Listing	O.F.	P.T. max. mm in.	O.T. max.	D.T. max. mm in.
CW actuation*. 15 amp. SPDT.		A	EX-AR	2,22-5,56 N .5-1.25 lb.	5,56 .219 (8°)	90°	0,18 .007 (0.25°)
CW actuation*. 20 amp. SPDT.		B	EXA-AR	3,34-8,90 N .75-2 lb.	5,56 .219	25°	0,3 .012 (4°)
CCW actuation*. 15 amp. SPDT.		A	EX-AR30	11,1 N 2.5 lb. max.	2,65 .065	25°	0,18 .007 (0.25°)
CW or CCW actuation*. 15 amp. Low O.F. (no return spring). Without mtg. bracket. SPDT.		A	EX-AR16	0,56 N 2 oz. max.	—	—	—
Also UL listed and CSA certified for Class I Group B (hydrogen) atmospheres.	CW actuation*. 15 amp. SPDT.	A	EX-AR800	2,22-5,56 N .5-1.25 lb.	5,56 .219	90°	0,18 .007 (0.25°)
	CCW actuation*. 15 amp. SPDT.	A	EX-AR830	11,1 N 2.5 lb. max.	1,65 .065	25°	0,18 .007 (0.25°)
	CW actuation*. 10 amp. DPDT.	C	EXD-AR-3†	2,22-6,67 N .5-1.5 lb.	6,35 .250	25°	2,77 .109 (4°)
	CCW actuation*. 10 amp. DPDT.	C	EXD-AR30-3†	12,2 N 2.75 lb.	5,56 .219	25°	2,77 .109
	CW actuation*. 1 amp.** SPDT.	E	EXH-AR3	2,22-6,67 N .5-1.5 lb.	5,56 .219	25°	0,64 .025
	CCW actuation*. 1 amp.** SPDT.	E	EXH-AR33	11,1 N 2.5 lb. max.	1,65 .065 (3.5°)	25°	0,64 .025
No lever furnished. (Order levers shown at left of this page as separate items.) CW actuation*. SPDT.		A	EX-AR20	0,22 Nm 31.25 in./oz.	5,56 .219	90°	0,18 .007 (0.25°)
As above except CCW actuation.		A	EX-AR230	0,22 Nm 31.25 in./oz.	5,56 .219	90°	0,18 .007 (0.25°)

Nm = Newton meters

* CW (clockwise) or CCW actuation, when looking at nameplate.

** Hermetically sealed switching unit, furnished with 10.5 ft./3.2 m leadwire.

† Furnished with 0,91 m (3 ft.) leadwire

Characteristics; O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

Roller Lever



6PA5-EX
(Bronze roller)

6PA127-EX
(Nylon roller)

Cross Roller Lever



6PA131-EX
(Bronze roller)

One-Way Roller Lever



For CW actuation:
6PA130-EX
(Bronze roller)
For CCW actuation:
6PA142-EX
(Bronze roller)

Adjustable Length Roller Lever



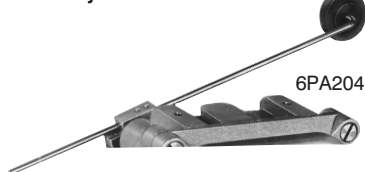
6PA138-EX
(Nylon roller)

Rod Lever



6PA136-EX
(Aluminum rod)

Adjustable length 12.5" max. rod lever with 1" nylon roller.



6PA204-EX

Limit and Enclosed Switches

EX Series

Explosion-Proof Switches

CROSS ROLLER LEVER ACTUATED SWITCH



ORDER GUIDE

Description	Elec. Rating Pg. A121	Catalog Listing	O.F. N oz.	P.T. max. mm in.	O.T. max.	D.T. max. mm in.
CW actuation* 15 amp. SPDT	A	EX-CR	2,22-5,56 8-20	5,56 .219	90°	0,18 .007

ONE-WAY ROLLER LEVER ACTUATED SWITCH



ORDER GUIDE

Description	Elec. Rating Pg. A121	Catalog Listing	O.F. N oz.	P.T. max. mm in.	O.T. max.	D.T. max. mm in.
CW actuation* 15 amp. SPDT	A	EX-AR128	2,22-5,56 8-20	5,56 .219	90°	0,18 .007

Limit/Enclosed

LOW FORCE ROD LEVER ACTUATED SWITCH



ORDER GUIDE

Description	Elec. Rating Pg. A121	Catalog Listing	O.F. max. N oz.	P.T. max.	O.T. min.	D.T.
Furnished without mounting bracket. CW actuation* 15 amp. SPDT	A	EX-AR1613	0,56 2	18°	40°	—

MANUALLY ACTUATED SWITCH



ORDER GUIDE

Description	Elec. Rating Pg. A121	Catalog Listing	O.F. max. N lb.
Large 3 x 3.5 inch paddle for fast, easy operation. 15 amp. SPDT	A	EX-AR50	11,1 2.5

OVERTRAVEL PLUNGER ACTUATED SWITCHES



ORDER GUIDE

Description		Elec. Rating Pg. A121	Catalog Listing	O.F. max. N lb.	P.T. max. mm in.	O.T. min. mm in.	D.T. max. mm in.	O.P.** mm in.
15 amp. SPDT		A	EX-Q	13,34 3	1,98 .078	4,78 .188	0,10 .004	47,22 1.859
20 amp. SPDT		B	EXA-Q	8,90 2	1,27 .050	3,18 .125	0,23 .009	46,02 1.812
Also UL listed for Class I, Group B (hydrogen) atmospheres.	15 amp SPDT	A	EX-Q800	13,34 3	1,98 .078	4,78 .188	0,10 .004	47,22 1.859
	10 amps DPDT	C	EXD-Q-3†	13,34 3	3,96 .156	3,58 .141	1,52 .060	46,02 1.812
With seal boot on plunger. 10 amp. SPDT		D	EX-N15	13,34 3	1,98 .078	4,78 .188	0,10 .004	52,32 2.060

* CW (Clockwise) or CCW actuation, when looking at nameplate.

** Tolerance ± 1.52 in./ .060 mm.

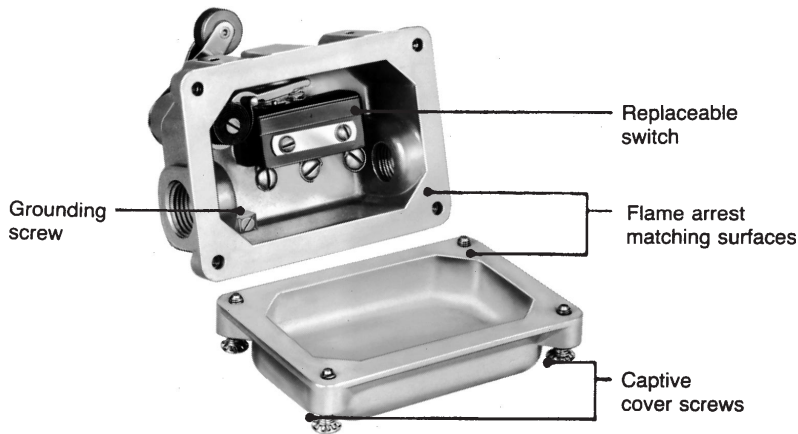
† Furnished with 0,91 m (3 ft.) leadwire.

Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel
N = Newtons

Limit and Enclosed Switches
Explosion-Proof Switches

EX Series

Double-conduit
connect switch



EX switches on this page have conduit openings on each side of the enclosure which enable through-wiring. This feature also allows the user to split the wiring of a double-pole switch, with one-pole exiting from each side.

The enclosure is larger than EX switches with one conduit opening and provides additional space for wiring.

NEMA Double-conduit connect EX switches also meet the applicable portions of the NEMA classifications listed on page A121.

ROLLER LEVER ACTUATED SWITCHES

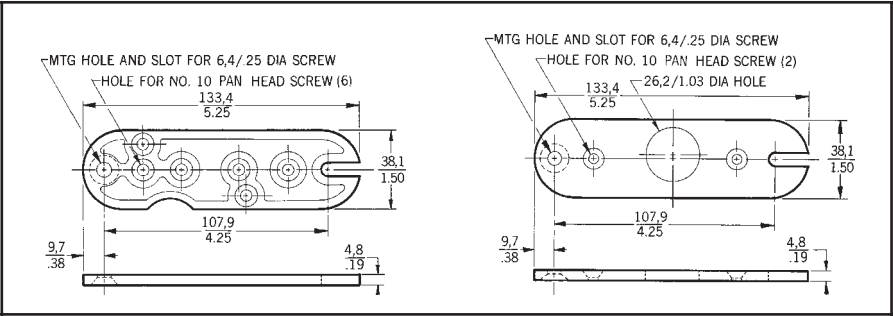


ORDER GUIDE

Table with 7 columns: Description, Elec. Rating Pg. A121, Catalog Listing, O.F. N oz., P.T. max. mm in., O.T. max., D.T. max. mm in. It lists three switch models with their respective ratings and dimensions.

* CW (clockwise) or CCW actuation, when looking at nameplate.
N = Newtons
† Furnished with 0,91 m (3 ft.) leadwire.
Characteristics: O.F. — Operating Force; P.T. — Pretravel; O.T. — Overtravel; D.T. — Differential Travel.

MOUNTING BRACKETS



15PA85-EX is used for top, bottom, back or end mounting. It is furnished with each switch, except where noted in the order guides.

15PA86-EX is ordered separately for top mounting of plunger switches. EX switches may also be direct mounted, using 10-32 UNF screws.

Limit and Enclosed Switches

EX Series

Explosion-Proof Switches

REPLACEMENT PARTS

Switch Listing	Catalog Listing Replacement Part Numbers		
	Switching Unit	Actuator	Springs
EX-AR	BZ-2R-P4	6PA5-EX	33PA7-EX
EX-AR16	BZ-2RW88-P5	6PA5-EX	—
EX-AR20	BZ-2R-P4	*	33PA7-EX
EX-AR30	BZ-2R-P4	6PA5-EX	33PA5-EX
EX-AR50	BZ-2R-P4	6PA134-OP	33PA7-EX
EX-AR800	BZ-2R-P4	6PA5-EX	33PA7-EX
EX-CR	BZ-2R-P4	6PA131-EX	33PA7-EX
EX-Q	BZ-2R-P4	8PA15-EX	—
EX-N15	BZ-2R15-P4	8PA12-EX	—
EXA-AR	BA-2R-P4	6PA5-EX	33PA6-EX
EXD-AR-3	DT-2R4-A7	6PA5-EX	33PA6-EX
EXH-AR3	4HS202	6PA5-EX	33PA6-EX
EXH-AR33	4HS203	6PA5-EX	33PA5-EX
EXD-AR30-3	DT-2R711-A7	6PA5-EX	33PA5-EX

Switch Listing	Catalog Listing Replacement Part Numbers		
	Switching Unit	Actuator	Spring
EX-AR128	BZ-2R-P4	6PA130-EX	33-PA7-EX
EX-AR1613	BZ-2RW88-P5	6PA136-EX	—
EX-Q800	BZ-2R-P4	8PA15-EX	—
EXA-Q	BA-2R-P4	8PA15-EX	—
EXD-Q-3	DT-2R-A7	8PA77-EX	—
1EX1	BZ-2R-P4	6PA5-EX	33PA7EX
2EX1	BA-2R-P4	6PA5-EX	33PA6-EX
4EX1-3	DT-2R4-A7	6PA5-EX	33PA6-EX

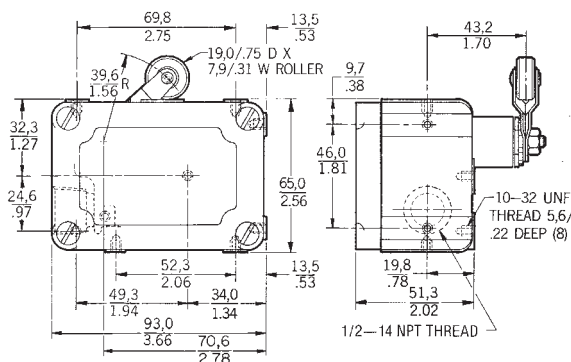
* Actuators for EX-AR20 are shown on page A122.

In addition to the items shown above, the following replaceable internal levers are available: **33PA1-EX** for EX-AR, EX-AR800, EXA-AR, EXD-AR-3, EXH-AR3, EX-AR20, EX-CR, EX-AR128, 1EX1, 2EX1, and 4EX1-3.

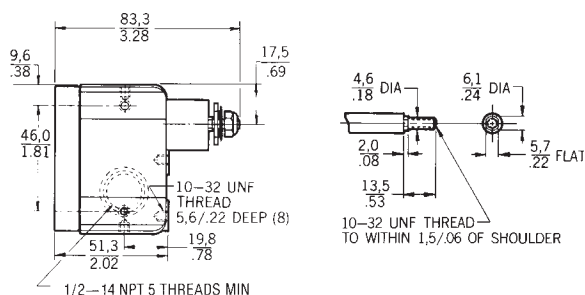
Limit/Enclosed

MOUNTING DIMENSIONS (For reference only)

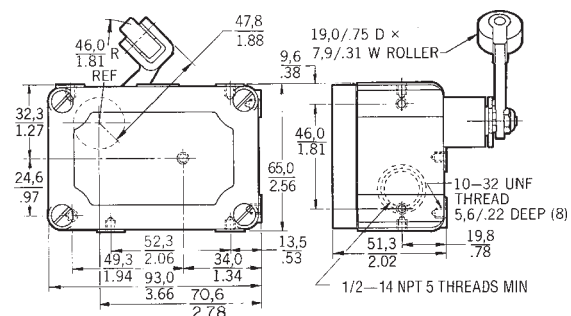
ROLLER LEVER



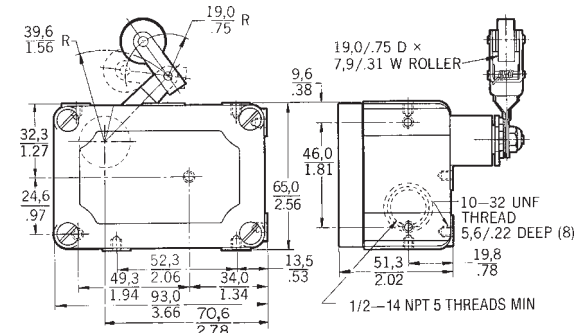
NO LEVER



CROSS ROLLER LEVER



ONE-WAY ROLLER LEVER



Key: 0,0 = mm
0.00 = inches

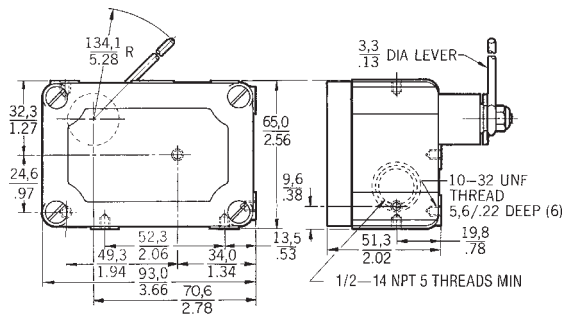
Limit and Enclosed Switches

EX Series

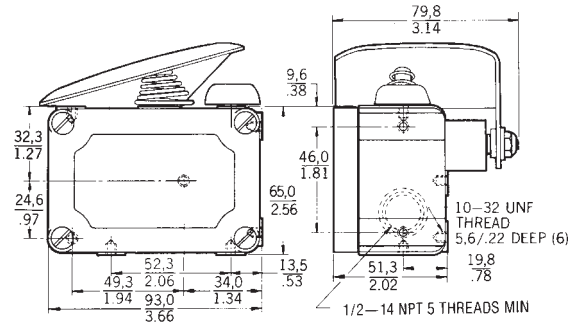
Explosion-Proof Switches

MOUNTING DIMENSIONS (For reference only)

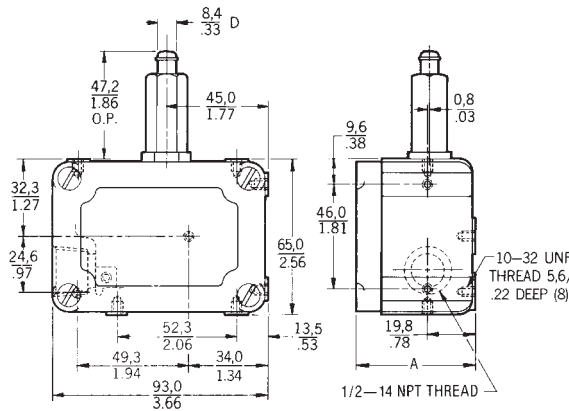
LOW FORCE ROD



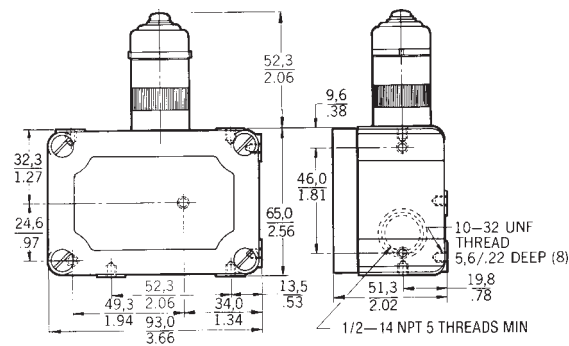
MANUAL ACTUATOR



PLUNGER

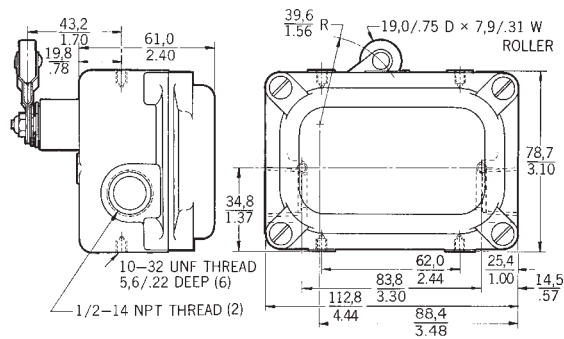


PLUNGER WITH SEAL BOOT



SWITCHES WITH DOUBLE CONDUIT OPENINGS

ROLLER LEVER



Limit and Enclosed Switches

CX Series

Weather-Sealed Explosion-Proof Switches

FEATURES

- Sealing - applicable portions of NEMA 1, 3, 4, 4X, 6, 6P, 7, 9, and 13
- Watertight and dusttight for outdoor use
- 4-20 mA analog output available
- UL Listed, file #E14274
- Analog UL file #E68247
- CSA Certified, file #LR57324
- Rugged cast aluminum housing
- Pretravel, overtravel, and actuating sequence can be field adjusted without tools (all basics individually)
- Rotary types convert in seconds to clockwise, counterclockwise, or both-way operation

CX switches are built especially for outdoor use in hazardous atmospheres. These enclosures are constructed to withstand the pressure of an internal explosion. Flame paths cool the exploded gases to a point less than the lowest safe operating temperature of the surrounding gas.

O-ring seals make the enclosure weather-proof but are outside of required flame paths so explosion proof requirements are maintained.

Analog output: either resistive or 4-20 mA is available.

Operating temperature range is -25° to +85°C (-13° to 185°F).

NEMA standards: 1, 3, 4, 4X, 6, 6P, 7, 9 and 13.

UL listed: Class I, Div. 1, Groups B (14CX, 16CX, 24CX, 26CX, 36CX, and 84CX only), C and D; and Class II, Div. 1, Groups E, F and G. CSA certified: Class I, Div. 1, Groups B (14CX, 16CX, 24CX, 26CX, 36CX and 84CX only), C and D; and Class II, Groups E, F and G.

For rapid response – off the shelf service, all **bold face** listings are normally stocked items.

ROTARY ACTUATED SWITCHES



Short housing



Standard housing

Actuators are not included with switch. Order them separately.

ROTARY LEVERS

Lever Type	Catalog Listing
1.5 in. lever, no roller	LSZ51
.75 in. roller, front	LSZ51A
.75 in. roller, back	LSZ51C
1.5-3.5 in. adjustable lever	LSZ52C
.75 in. roller	LSZ52J
1.0 in. roller	LSZ52K
1.5 in. roller	
1.5 in. yoke roller	LSZ53S
.75 in. rollers, back	LSZ53E
.75 in. rollers, each side	
5 in. rod lever	LSZ54M
Hub only	LSZ54
1.5 in. offset lever, no roller	LSZ55
.75 in. roller, back	LSZ55A
.75 in. roller, front	LSZ55C

Rollers are nylon. Non-sparking rollers must be used in hazardous locations.

ORDER GUIDE

As factory assembled, all basic switches operate on clockwise and counterclockwise rotation. Actuating mechanism can be field adjusted for CW or CCW operation only. No tools are required.

Description ¹	Catalog Listings Shaft Restoring Force To Center		Housing Size	Basic Switch(es) ²	Electrical Ratings
	With	W/O ²			
15 amp. SPDT.	11CX1 11CX2 21CX3 21CX4	11CX11 11CX12 21CX13 21CX14	Short Short Standard Standard	BZ(1) BZ(2) BZ(3) BZ(4)	A A A A
20 amp. SPDT.	12CX1 12CX2 22CX3 22CX4	12CX11 12CX12 22CX13 22CX14	Short Short Standard Standard	BA(1) BA(2) BA(3) BA(4)	B B B B
Also UL listed for Class I. Group B (hydrogen atmospheres). 10 amp. DPDT.	14CX1 24CX2 24CX3	14CX11 24CX12 24CX13	Short Standard Standard	DT(1) DT(2) DT(3)	C C C
Also UL listed for Class I, Group B (hydrogen atmospheres). 1 amp. SPDT.	16CX2 26CX4 16CX1 26CX3	16CX12 26CX14 16CX11 26CX13	Short Standard Short Standard	HS(2) HS(4) HS(1) HS(3)	D D D D
Analog position sensing.* Current output (4-20 mA).	— —	18CX10 281CX12 284CX12	Short Standard Standard	None BZ(2) DT(2)	— A C
Analog position sensing.* Resistive output.	19CX0 29CX1 29CX2	— — —	Short Standard Standard	None BZ(1) BZ(2)	— A A
1 amp. SPDT with gold contacts.	1172CX2 2172CX4	1172CX12 2172CX14	Short Standard	BZ(2) BZ(4)	F F

* Where noted, BZ basic switches are 15 amp, SPDT; DT basic switches are 10 amp DPDT. Refer to next page for analog position sensing specifications.

MOUNTING HOLES

Add the letter A to listings with side mounting holes tapped 5/16-18(8).

Example: 11CX2**A**

Add the letter B to listings with thru mounting holes tapped 3/8-24(4).

Example: 11CX2**B**.

¹ Basic switches operate nearly simultaneously in multiple switch devices.

² Shafts of devices without shaft restoring force can be rotated through 360°.

Basic switches will be in operated mode through two 105° sections.

Eight side mounting holes can be tapped 5/16"-18.






Limit/Enclosed

Limit and Enclosed Switches

Weather-Sealed Explosion-Proof Switches

CX Series

ELECTRICAL RATINGS

Circuitry	Electrical Ratings
 <p>A BZ Single-Pole Double-throw</p>	UL/CSA Rating: L96 15 amps, 120, 240 or 480 VAC, ind. and res. 1/8 Hp, 120 VAC; 1/4 Hp, 240 VAC. .5 amp, 125 VDC, .25 amp, 250 VDC., res.
 <p>B BA Single-Pole Double-throw</p>	UL/CSA Rating: L23 20 amps, 120, 240 or 480 VAC, ind. and res. 1 Hp, 120 VAC; 2 Hp, 240 VAC. .5 amp, 125 VDC, .25 amp, 250 VDC res.
 <p>C DT Double-pole Double-throw</p>	UL/CSA Rating: L59 10 amps, 120 or 240 VAC, ind. and res. .3 amp, 125 VDC, .15 amp, 250 VDC, res.
 <p>D HS Single-Pole Double-throw</p>	UL/CSA Rating: L22 1 amp, 120 VAC, ind. and res.
 <p>F BZ (Gold Contact) Single-Pole Double-throw</p>	UL/CSA Rating: L22 1 amp, 125 VAC

REPLACEMENT BASIC SWITCH ASSEMBLIES

These assemblies are factory adjusted to the same operating characteristics as a new CX switch. They include components subject to mechanical or electrical wear: basic switches, cam wheels and followers, and springs.

To order, change the first number in the complete switch catalog listing to 9 for rotary switches and 10 for plunger switches with short housings.

Example:

Rotary switch **12CX5**

Replacement = **92CX5**

Plunger switch **36CX2**

Replacement = **106CX2**

Note: Basic switch assemblies for rotary actuated switches, with or without shaft restoring force, will be the same.

For example:

11CX1 and 11CX11 use 91CX1.

ANALOG POSITION SENSING SPECIFICATIONS

Current Output (4-20 mA)	Resistive Output	Replacement PC Board
Voltage compliance range: 12.5 to 40 VDC Maximum load resistance: RL, Max., $\frac{V \text{ Supply} - 12.5}{20 \text{ mA}}$ Current signal output: 4-20 mA Span: Adjustable from 15° to 90° of angular rotation. Null: 4 mA position may be set at any angular position.	500 ohms \pm 10% in center (free position) 975 ohms max at 105° rotation clockwise (CW). 25 ohms min. at 105° rotation CCW. 2 watts power at 70°/150°F at full scale Different potentiometer values can be ordered. (Minimum order quantities may be required.)	For current output devices 15PA261-CX

PLUNGER ACTUATED SWITCHES



Standard housing shown.

ORDER GUIDE

Description ¹	Catalog Listing With Restoring Force	Housing Size	Basic Switch(es)	Electrical Ratings
15 amp. SPDT	31CX1 31CX2 41CX3 41CX4	Short Short Standard Standard	BZ(1) BZ(2) BZ(3) BZ(4)	A A A A
20 amp. SPDT	32CX1 32CX2 42CX3 42CX4	Short Short Standard Standard	BA(1) BA(2) BA(3) BA(4)	B B B B
Also UL listed for Class I, Group B (hydrogen atmospheres). 1 amp. SPDT.	36CX1 36CX2	Short Short	HS(1) HS(2)	D D

¹ Basic switches operate nearly simultaneously in multiple switch devices.

OPERATING CHARACTERISTICS (All CX Switches)

Basic Switch Type	Rotary Actuation				Plunger Actuation		
	BZ	BA	DT	HS	BZ	BA	HS
Pretravel (max.)*	15°	15°	30°	30°	.10 in./2.5 mm		
Differential Travel (max.)	10°	10°	25°	20°	.04 in./1.0 mm		
Overtravel (min.)*	90°	90°	75°	75°	.19 in./4.75 mm		
Operating Torque (max.)	11.1 in. lb./1,25 Nm				—		
Operating Force (max.)	—				8.82 lb./39.2 N		

* May be modified in field to suit application requirements.

N = Newtons

Nm = Newton meters

LOW TEMPERATURE SWITCHES

Add the letter C to listings for low temperature versions.

Example: 21CX14**C** –40°F (–40°C) Rotary

36CX2**C** –35°F (–37°C) Plunger

Weather-Sealed Explosion-Proof Switches

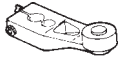
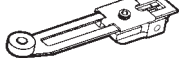
80CX SWITCHES ALSO WITHSTAND CORROSIVE ENVIRONMENTS

80CX switches have rugged bronze housings which are resistant to salt water and other corrosive environments. They comply with the NEMA 4X requirement for protection against corrosion, in addition to NEMA enclosure standards met by other CX switches. O-ring seals make the enclosure weather-proof, but are outside of required flame paths so explosion-proof requirements are maintained.

STAINLESS STEEL LEVER ACTUATORS

These levers match the corrosion resistance of the 80CX housing. Non-sparking rollers must be used in hazardous locations.

ORDER GUIDE STAINLESS STEEL LEVERS WITH NYLON ROLLERS

 Std. Roller Lever	Radius (In.)	Dia. In.	Width In.	Catalog Listing
	1.5	.75	.25	LS2Z51A
Std. Lever w/o roller	1.5	.75	.25	LS2Z51
 Adjustable Radius	1.5-3.5	.75	.25	LS2Z52A

Note: Refer to page A36 for lever dimensions.

ROTARY ACTUATED SWITCHES



80CX switches available with standard housing only.

Actuators are not included with switches. Order them separately.

MOUNTING HOLES

Add the letter A to listings with side mounting holes tapped 5/16-18(8).

Example: 82CX2A

Add the letter B to listings with thru mounting holes tapped 3/8-24(4).

Example: 81CX2B.

ORDER GUIDE

As factory assembled, all basic switches operate on clockwise or counterclockwise rotation. Actuating mechanism can be field adjusted for CW or CCW operation only. No tools are required.

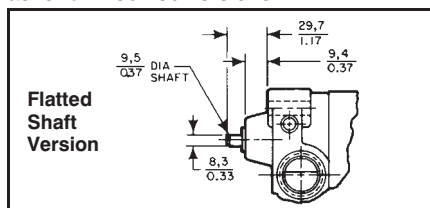
Description ¹	Catalog Listings Shaft Restoring Force To Center		Housing Size	Basic Switch(es)	Electrical Ratings Page A109
	With	Without ²			
15 amp. SPDT	81CX1	81CX11	Standard	BZ(1)	A
	81CX2	81CX12	Standard	BZ(2)	A
	81CX3	81CX13	Standard	BZ(3)	A
	81CX4	81CX14	Standard	BZ(4)	A
20 amp. SPDT	82CX1	82CX11	Standard	BA(1)	B
	82CX2	82CX12	Standard	BA(2)	B
	82CX3	82CX13	Standard	BA(3)	B
	82CX4	82CX14	Standard	BA(4)	B
Also UL listed for Class I, Group B (hydrogen atmospheres). 10 amp. DPDT	84CX1	84CX11	Standard	DT(1)	C
	84CX2	84CX12	Standard	DT(2)	C
Potentiometer-equipped versions. (Where noted, basic switches are 15 amps, SPDT.)	89CX0	—	Standard	Pot. only	E
	89CX1	—	Standard	BZ(1), pot.	A,E
	89CX2	—	Standard	BZ(2), pot.	A,E

Notes: Refer to page A127.

MODIFIED SHAFT ENABLES DIRECT COUPLING

CX switches are available with a 3/8 inch diameter by 3/4 inch long flatted shaft which conforms to standard NEMA motor shaft specifications. It accepts commercially available shaft couplers, permitting easy, direct coupling to most equipment actuators.

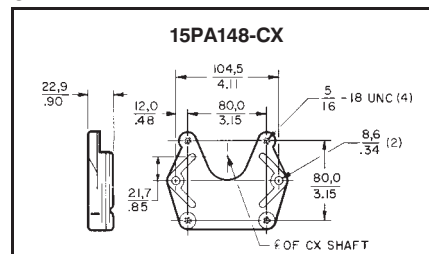
To specify a "direct-couple" CX switch, add **-DO1** to catalog listings shown in the order guides, i.e. 11CX12-**DO1**. Pricing is the same as for unmodified versions.



MOUNTING BRACKET

An aluminum mounting bracket is available for adapting CX switches to existing 2-hole mounting arrangements.

To order, specify Catalog Listing **15PA148-CX**.



Limit/Enclosed

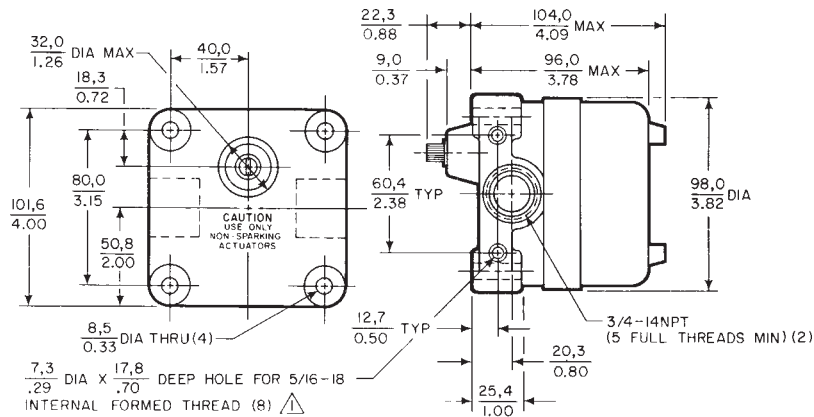
Limit and Enclosed Switches

CX Series

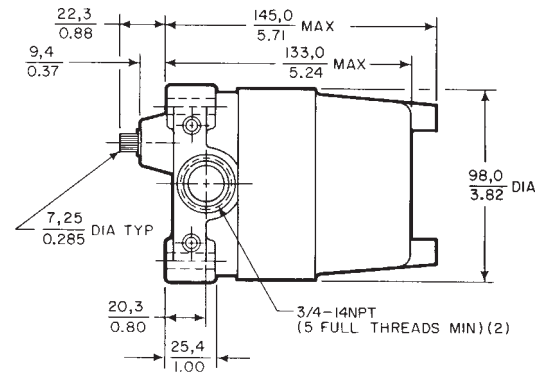
Weather-Sealed Explosion-Proof Switches

MOUNTING DIMENSIONS (For reference only)

ROTARY

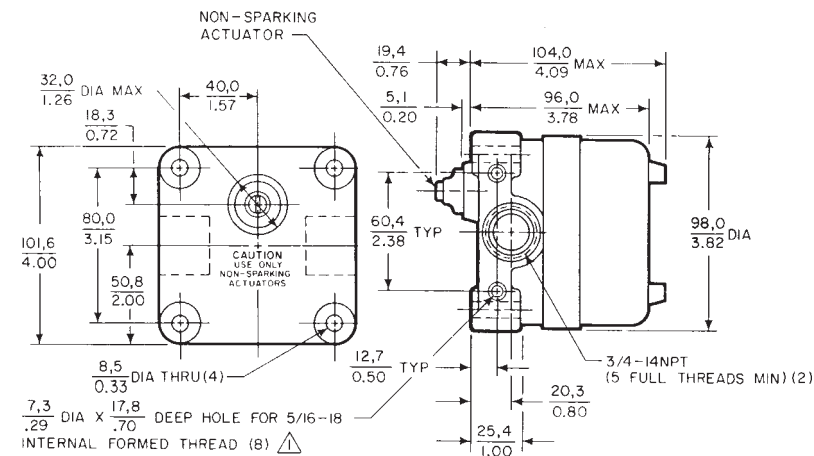


Standard housing

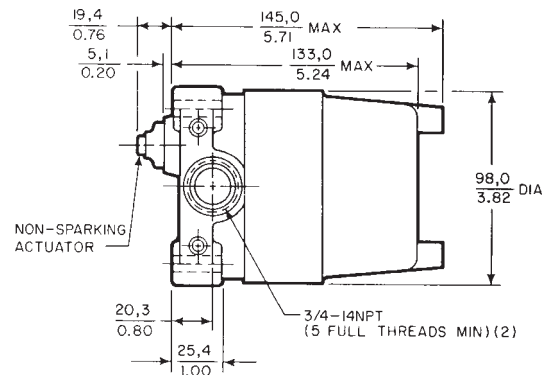


PLUNGER

Short housing



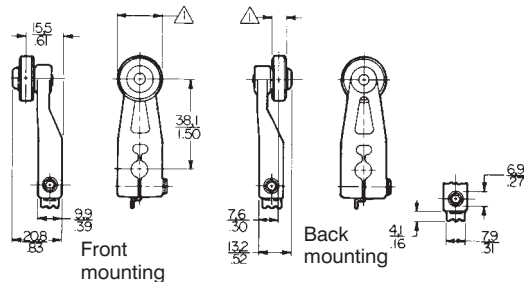
Standard housing



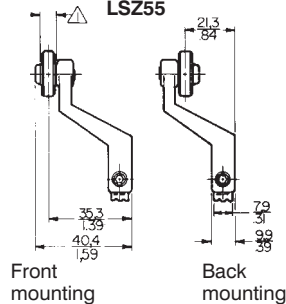
⚠ THESE HOLES NOT FURNISHED ON 80CX SERIES

LEVER ACTUATORS

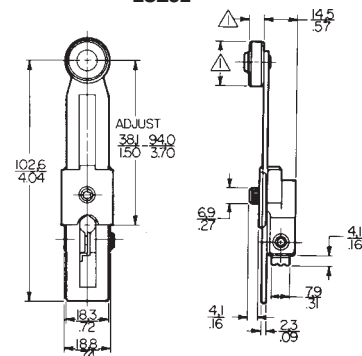
LSZ51



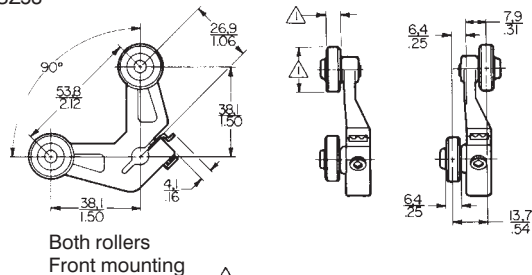
LSZ55



LSZ52

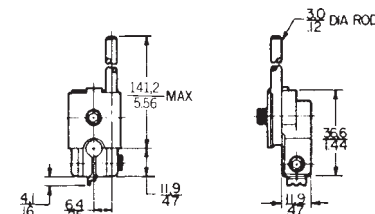


LSZ53



⚠ See order guides for roller dimensions.

LSZ54



Limit and Enclosed Switches

Operating Characteristics

Definitions below explain the meaning of operating characteristics. Characteristics shown in tables throughout catalog were chosen as most significant. Sketches show how characteristics are measured for in-line plunger actuation and rotary actuation.

Linear dimensions for in-line actuation are from top of plunger to a reference line, usually the center of the mounting holes. In the case of flange or bottom mounted switches, the reference line is the bottom of the switch. Rotary actuated HDLS, LS and ML limit switches have the characteristics in degrees of angular rotation. The operating characteristic dimensions on enclosed switches such as E6, OP, and EX with rotary actuators are listed in linear dimensions with the adjustable lever in one extreme position.

Differential Travel (D.T.) — Plunger or actuator travel from point where contacts “snap-over” to point where they “snap-back.”

Free Position (F.P.) — Position of switch plunger or actuator when no external force is applied (other than gravity).

Full Overtravel Force — Force required to attain full overtravel of actuator.

Operating Position (O.P.) — Position of switch plunger or actuator at which point contacts snap from normal to operated position. Note that in the case of flexible or adjustable actuators, the operating position is measured from the end of the lever or its maximum length. Location of operating position measurement shown on mounting dimension drawings.

Operating Force (O.F.) — Amount of force applied to switch plunger or actuator to cause contact “snap-over.” Note in the case

of adjustable actuators, the force is measured from the maximum length position of the lever.

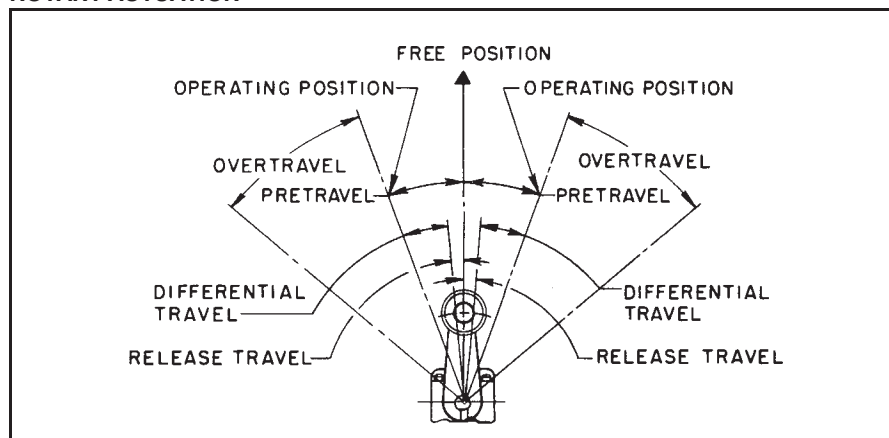
Overtravel (O.T.) — Plunger or actuator travel safely available beyond operating position.

Pretravel (P.T.) — Distance or angle traveled in moving plunger or actuator from free position to operating position.

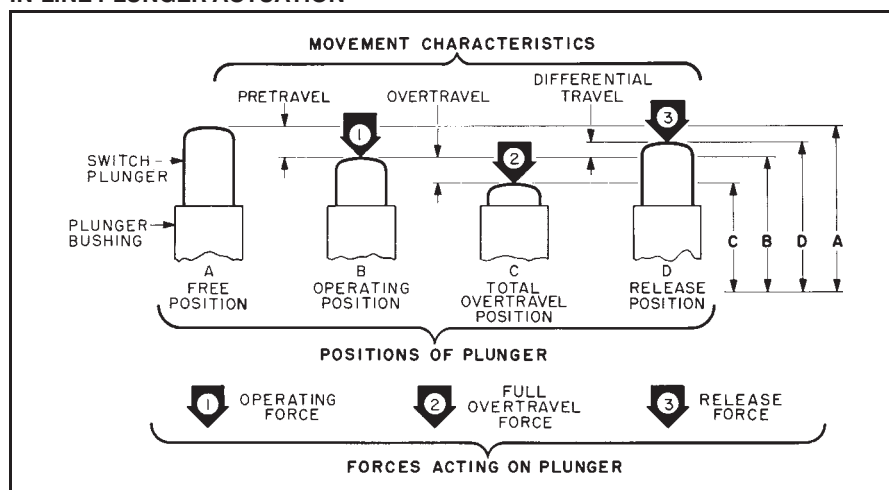
Release Force (R.F.) — Amount of force still applied to switch plunger or actuator at moment contacts snap from operated position to unoperated position.

Total Travel (T.T.) — Distance from actuator free position to overtravel limit position.

ROTARY ACTUATION



IN-LINE PLUNGER ACTUATION



FULL LOAD AND LOCKED ROTOR CURRENTS FOR SINGLE PHASE AND DC MOTORS.

HP	Alternating Current				Direct Current			
	115 Volts		230 Volts		115 Volts		230 Volts	
	Full Load	Locked Rotor	Full Load	Locked Rotor	Full Load	Locked Rotor	Full Load	Locked Rotor
2	24.0	144.0	12.0	72.0	17.0	170.0	8.5	85.0
1½	20.0	120.0	10.0	60.0	13.2	132.0	6.6	66.0
1	16.0	96.0	8.0	48.0	9.6	96.0	4.8	48.0
¾	13.8	82.8	6.9	41.4	7.4	74.0	3.7	37.0
½	9.8	58.8	4.9	29.4	5.4	54.0	2.7	27.0
⅓	7.2	43.2	3.6	21.6	3.8	38.0	1.9	19.0
¼	5.8	34.8	2.9	17.4	3.0	30.0	1.5	15.0
⅙	4.4	26.4	2.2	13.2	2.4	24.0	1.2	12.0
⅕	3.8	22.8	1.9	11.4	2.2	22.0	1.1	11.0
⅒	3.0	18.0	1.5	9.0	2.0	20.0	1.0	10.0
1/20	1.5	9.0	—	—	—	—	—	—

Limit/Enclosed

Limit and Enclosed Switches

Reference Standards

MICRO SWITCH ENCLOSURES IN THIS CATALOG

	NEMA TYPES													
	Non-Hazardous Locations								Hazardous Locations					
	1	3	4	4X	6	6P	12	13	7B	7C	7D	9E	9F	9G
HDLS*	●	●	●	● ⁹	●	● ¹⁰		●						
LS	●	●	●		●			●						
E6/V6	●													
BZG/BZH	●	● ³	● ₃					● ³						
BAF1	●	● ²	● ²					● ²						
OP	●	● ³	● ³					● ³						
914CE	●	●	● ⁴		● ⁴	● ⁴	● ⁴	● ⁴						
LN	●	●	●					●						
LSX	●	●	●		●			●	●	●	●	●	●	●
EX	●								● ⁵	●	●	●	●	●
CX	●	●	●	● ⁶				●	● ⁷	●	●	●	●	●
BF	●	●	●					●						
CLS	●	●	●					●						
2CLS	●	●	●					●						
CLSX	●	●	●					●	●	●	●	●	●	●

Note 2 — Not applicable to BAF-1-2RQ9 listings.
Note 3 — Not applicable to Q-plunger types.
Note 4 — 914CE1, 914CE2, and 914CE3 listings comply with NEMA 1 and 3 only.

Note 5 — Only EX series 800, EXD, EXH, and EXN.
Note 6 — Only CX series 80.
Note 7 — Only listings with HS or DT basic switches.

Note 8 — Not applicable to LZ side lever types.
Note 9 — Stainless steel LS2.
Note 10 — Pre-wired HDLS.

APPLICATION INFORMATION

WRONG

RIGHT

1.

Opposite polarities should **not** be connected to the contacts of one limit switch unless the limit switch is specifically designed for such service.

WRONG

2.

Power from different sources should **not** be connected to the contacts of one limit switch unless specifically designed for such service.

WRONG

RIGHT

3.

Limit switches should be used within their contact ratings.

SLOW MOTION

4.

Where relatively slow motions operate the limit switch, it should generally be snap-acting.

WRONG

RIGHT

5.

Cam or dog arrangements should be such that the actuator is **not** suddenly released to snap back freely.

WRONG

RIGHT

6.

Where relatively fast motions are involved, cam arrangements should be such that the actuator does **not** receive a severe impact.