
Limit Switches

9007 range

Catalog



Selection guide	page 4
------------------------------	---------------

Class 9007

■ Snap Action Industrial Switches	
□ Presentation	page 10
□ Dimensions	page 10
■ Miniature Type MS and ML	
□ Presentation	page 13
□ Dimensions	page 17
■ 9007AW Heavy Duty Industrial	
□ Presentation	page 18
□ Dimensions	page 18
■ 9007C Heavy Duty Industrial	
□ Presentation	page 19
□ Standard Body	page 21
□ Compact Body	page 25
□ Factory Modifications (Forms)	page 29
□ Accessories	page 34
□ Standard Body — Dimensions	page 35
□ Compact Body — Dimensions	page 37
□ Adaptable Sub-Assemblies	page 39
□ Lever Arms for Rotary Heads	page 43
□ Body and Heads — Dimensions	page 49
□ Lever Arms for Rotary Heads — Dimensions	page 50
□ Hazardous Location	page 51
□ Hazardous Location — Dimensions	page 57
□ Cam Design	page 64
□ Linear/Angular Lever Travel	page 65
□ Installation Considerations	page 66
■ 9007T and FT Severe Duty Mill and Foundry Switches	
□ Presentation	page 67
□ 9007T Severe Duty Mill Switches	page 69
□ 9007FT Severe Duty Foundry Switches	page 72
□ Lever Arms and Renewal Parts	page 75
□ Dimensions	page 77
■ R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches	
□ Presentation	page 81
□ L100 Mill Switches	page 83
□ L300 Foundry Switches	page 85
□ L140 and L2153 Cable Pulls	page 87
□ L525 Belt Conveyor Switches	page 88
□ L100/L300 Lever Arms	page 89
□ L100/L300 Options and Accessories	page 92
□ Dimensions	page 93
□ Interpretation of Catalog Numbers	page 94
■ Product reference index	page 95

Limit switches

Class 9007 Industrial Snap Switches and Miniature Industrial Switches

Design	Industrial Snap Switch	Miniature Switch	Heavy Duty Industrial Precision Oiltight
			
Catalog Number Prefix	9007A 9007C	9007MS 9007ML	9007AW
Description	Industrial snap switches with or without operators	Miniature enclosed switches, potted and pre-wired with cable. Unique rotary head. 9007 ML has double break contacts.	Precision oil tight enclosed switches with unique features, micrometer adjustable and low temperature operation.
Enclosure Material	Plastic	Metal bodies, metal head	Metal bodies, metal heads
Enclosure Rating	None	NEMA: Types 1, 2, 4, 6, 6P, 12, 13 IEC: IP67	NEMA: Types 1, 2, 4, 6, 6P, 12, 13
Approximate Body dimensions (w x h x d), mm (.in)	29.0 x 63.5 x 21.0 (1.14 x 2.5 x 0.83)	40.1 x 44.4 x 15.8 (1.58 x 1.75 x 0.62)	36.6 x 98.5 x 63.5 (1.44 x 3.88 x 2.5)
Head	Linear	Linear or rotary	Linear or rotary
Contact blocks			
N.C. + N.O. snap action	X	X	X
N.C. + N.O. break before make, slow break			
N.O. + N.C. make before break, slow break			
N.C. + N.C. simultaneous, slow break			
N.O. + N.O. simultaneous, slow break			
C/O snap action			
C/O slow break			
N.C. + N.C. 2-step, slow break			
N.O. + N.O. 2-step, slow break			
N.C. + N.C. snap action			
N.O. + N.C. slow make, slow break			
Cabling		Pre-wired cable, M12 Connector option available.	
Temperature range	-65 to +221 °F (-54 to +105 °C)	-40 to +221 °F (-40 to +105 °C)	0 to +185 °F (-17.8 to 85 °C) Lever operated: -65 to +185 °F (-54 to 85 °C)
Additional Features	A variety of operators are available, page 10.	Bottom or side cable entry. Full range of operating heads, page 14.	Most common operating heads. Micrometer adjustable push rod plunger. Uses 9007C levers, page 18.

Limit switches

Class 9007 Type C Heavy Duty Industrial

Applications	Material handling—mechanical conveying, automotive, machine tool, packaging		Hazardous application locations: gases (explosion), dust environment.
Design	Standard body type 9007C****	Compact body type 9007C52**	Hazardous location body type 9007CR****



Catalog number	9007C54*** 9007C62*** 9007C66*** 9007C68***		9007C52**	9007CR53** 9007CR61** 9007CR65** 9007CR67**		
Enclosure	Metal, diecast, zinc alloy					
Features	Plug-in body			Non-plug-in body		
Factory modifications (Forms)	See page 19 to 28					
Modularity	Head + body + lever					
Conformity to standards	NEMA 250, EN 60947-1, EN 60947-5-1, IEC 60947, UL 508, C22-2-14-95, CE conformity documentation			NEMA 250, EN 60947-1, EN 60947-5-1, IEC 60947, UL 508, C22-2-14-95, CE conformity documentation		
Product certifications	UL, CSA, CE					
Body dimensions (w x h x d), mm (in.) with rotary head	39 x 102 x 45 (1.54 x 4.02 x 1.77)		39 x 80 x 45 (1.54 x 3.15 x 1.77)	69 x 156 x 53 (2.72 x 6.14 x 2.10)		
Head	Linear movement (plunger) Rotary movement (lever) Multi-directional movement (wobble stick, cat whisker)					
Contacts blocks	Snap action contacts	9007C54***	1 N.O. + 1 N.C	9007C52*** Y1561 ⊖ Single pole only	9007CR53**	1 N.O. + 1 N.C
		9007C62***	2 N.O. + 2 N.C.		9007CR61**	2 N.O. + 2 N.C.
		9007C68***	2 N.O. + 2 N.C. neutral position		9007CR65**	2 N.O. + 2 N.C. neutral position
		9007C66***	2 N.O. + 2 N.C. two stage		9007CR67**	2 N.O. + 2 N.C. two stage
	Direction opening (positive opening)	9007C*** Y1561 ⊕ Plunger and lever heads only Single pole only			9007CR*** Y1561 ⊕ Single pole only	
Rated insulation voltage	600 V		—			
Insulation voltage (Ui) top half of body	600 V Except: 9007CO62, 9007CO66, 9007CO68 (Ui = 250 V) and 9007C84, 9007C86 (Ui = 125 V)		600 V	600 V Except: 9007CR63, 9007CR65,9007CR67 (Ui = 250 V)		
Thermal current (Ithe) top half of body	10 A Excepted: 9007CO84, 9007CO86 (2.5 A)		10 A	10 A		
Degree of protection	IP 67 conforming to IEC 60529, NEMA Types 2, 4, 6, 6P, 12, 13		IP 67 conforming to IEC 60529, NEMA Types 2, 4, 6, 6P, 12, 13	NEMA Types 2, 4, 6P, 7, 9, 13		
Connection (1)	Cable entry or connector Depending on model: 1/2»-14 NPT, M20 x 1.5 ISO cable entry, 5-pin mini connector.		Cable entry or connector Depending on model: 1/2»-14 NPT, M20 x 1.5 ISO cable entry, 5-pin mini connector.	Cable entry or connector Depending on model: 1/2»-14 NPT, M20 X 1,5 ISO cable entry, 3/4 14 NPT available		
Page	21-24		25-28	51		

(1) A wide range of connectors are available. Contact your local field office.

Limit switches

Severe Duty Mill and Foundry Switches

Design/Applications	Mill			
	9007T Convertible sequence	L100 Fixed sequence	L14 Single Cable Pulls Fixed sequence	L525 Belt Conveyor Fixed sequence



Catalog number	9007T...	L100...	L14	L525
Enclosure	Metal			
Features	Extra heavy duty contact ratings			
Presentation, Applications and Characteristics	Page 67 to 74	Page 83 to 84	Page 87	Page 88
Conforming to standards	NEMA A600 UL508			
Product certifications	UL Listed, CSA Certified			
Body dimensions (w x h x d), mm (in.)	58.7 x 114.3 x 64.5 (2.31 x 4.5 x 2.54)	58.7 x 126 x 53.3 (2.31 x 4.95 x 2.10)	58.7 x 126 x 53.3 (2.31 x 4.95 x 2.10)	58.7 x 126 x 53.3 (2.31 x 4.95 x 2.10)
surface mounting				
Head	Rotary movement (lever)			
Contact blocks	1 N.C + 1 N.O			
	Snap action contacts (1)			
	Sequences			
Rated insulation voltage	600 V			
Thermal current (Ithe)	20 A ac/dc			
Degree of protection	NEMA Types 1, 2, 4, 12, 13 IP65, 66, 57			
Connection (2)	Cable entry or connector 1/2" NPT (metric available)			

(1) For other contact options please refer to your contact Customer Care Center.

(2) A wide range of connectors are available. Contact your local field office.

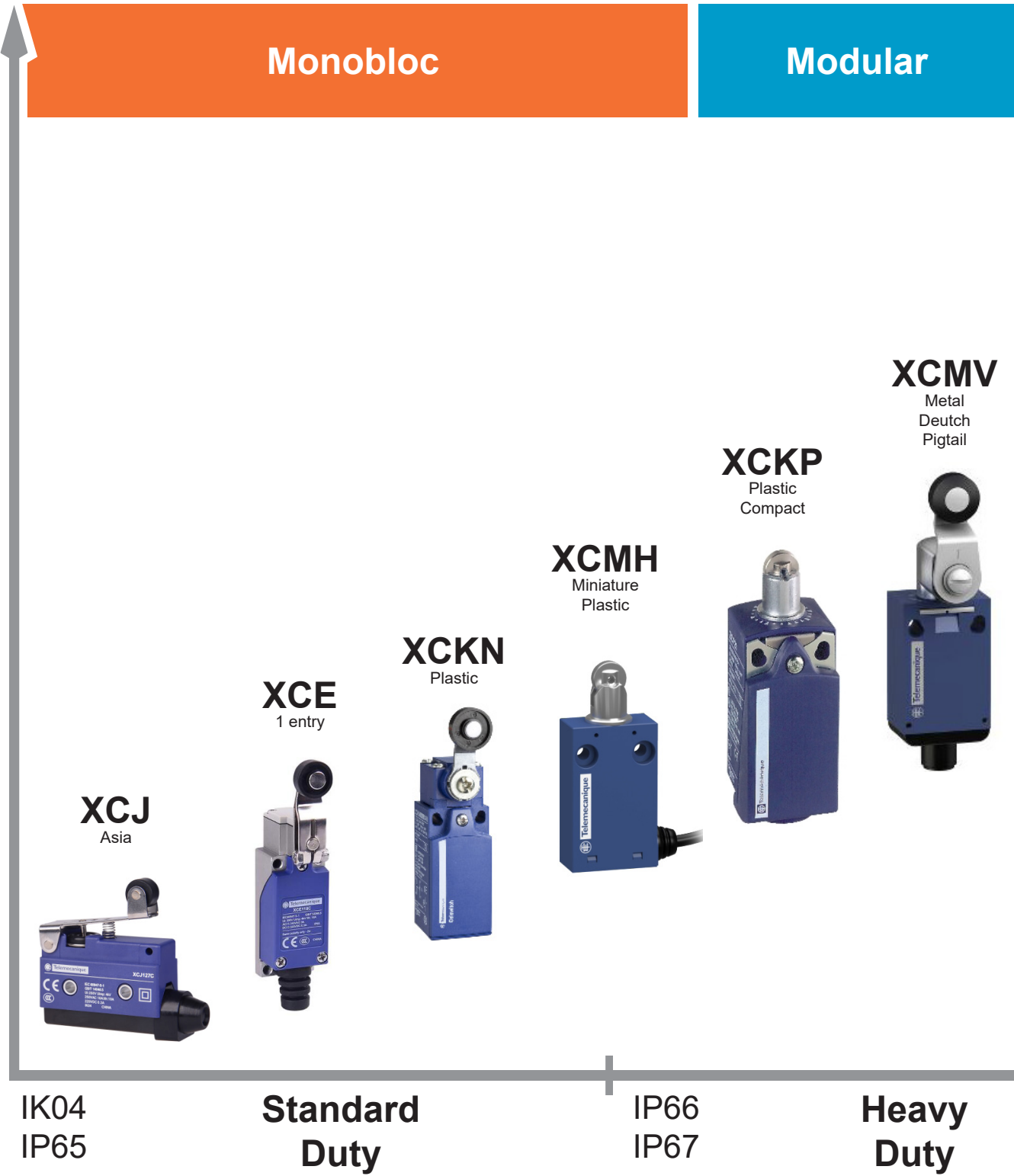
(3) Lever arms are optional and must be ordered separately.

Foundry		Mill and Foundry
9007T Convertible sequence	L300 Fixed sequence	L2153 Dual Pull Stop Fixed sequence



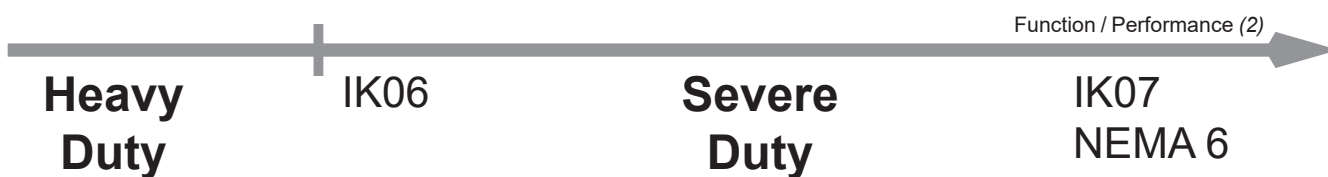
9007FT...	L300...	L2153
Metal		
Designed specifically for rough foundry applications		Extra heavy duty contact ratings
Page 72 to 74	Page 85 to 86	Page 87
NEMA A600 UL508		
UL Listed, CSA Certified		
58.7 x 114.3 x 86.6 (2.31 x 4.5 x 3.41)	58.7 x 126 x 53.3 (2.31 x 4.95 x 2.10)	58.7 x 126 x 53.3 (2.31 x 4.95 x 2.10)
Rotary movement (lever)		Rotary movement (lever) (3)
1 N.C + 1 N.O		
Convertible	Fixed	
600 V		
20 A ac/dc	20 A ac, 5 A dc	
NEMA Types 1, 2, 4, 12, 13 IP65, 66, 57	NEMA Types 1, 4, 13 IP65, 66	
Cable entry or connector 1/2" NPT (metric available)		

Application by
market segment



Please refer to the XC Limit Switches IEC Standard catalog, see number TESEBRO000093EN

Modular



(2) Usage value : waterproofness, robustness

Limit switches

Snap Action Industrial Switches

Class 9007

Industrial Snap Switches and Limit Switches without Enclosures

Industrial Snap Switches have been incorporated in many Telemecanique Sensors products such as timers, specialty push buttons, foot switches, operating mechanisms, door interlocks, motor control centers, position switches, and many other control products.

- **Recommended Actuator** — An adjustable actuator is recommended. If a non-adjustable actuator is used, a resilient type or a mechanical stop should be used to prevent bottoming of button mechanism.
- **Adjustable Actuator Overtravel** — Minimum recommended overtravel in both trip and reset directions is 0.015 in. (0.38 mm).
- **Non-Adjustable Actuator Total Travel** — Maximum differential limit plus 0.030 in. (0.76 mm). Example: 0.076 in. (1.9 mm) for Type AO2.
- **Non-Adjustable Actuator Total Travel** — Fully retracted — from mounting surface, at least 0.139 in. (3.5 mm) for Type AO1 and 0.160 in. (4.0 mm) for Types AO2 and CO3. Fully engaged — from mounting surface, at least 0.061 in. (1.5 mm) but not closer than 0.045 in. (1.1 mm).



Quick Make and Break

Type of Operator	Contact Arrangement (1)	Type	Type of Operator	Contact Arrangement (1)	Type	Type of Operator	Contact Arrangement (1)	Type
Basic Snap Switch	1 N.O. 1 N.C.	9007AO1	Rigid Roller Lever Type	2 N.O. 2 N.C.	9007CB31 (RH) (3) 9007CB32 (LH) (3) 9007CB41 (3) (without Side Mtg. Bracket) 9007CB33 (RH) (4) 9007CB34 (LH) (4)	Roller Plunger Type	1 N.O. 1 N.C.	9007AP321 9007AP324 (2)
	1 N.C.	9007AO1A					2 N.O. 2 N.C.	9007CP321 9007CP324 (2)
	1 N.O.	9007AO1B					Operator Only	9007AP301 (5) 9007AP304 (2) (5)
	1 N.O. 1 N.C.	9007AO2						
	1 N.C.	9007AO2A		1 N.O. 1 N.C.	9007AB25 (RH) 9007AB26 (LH)	Roller Plunger Type Panel Mounting Oiltight	1 N.O. 1 N.C.	9007AP323 9007AP325 (2)
	1 N.O.	9007AO2B		2 N.O. 2 N.C.	9007CB35 (RH) 9007CB36 (LH)		2 N.O. 2 N.C.	9007CP323 9007CP325 (2)
	2 N.O. 2 N.C.	9007CO3					Operator Only	9007AP303 (5) 9007AP305 (2) (5)
	2 N.O.	9007CO6 (Plug-in)						
	Two Stage 2 N.O. 2 N.C.	9007CO7		1 N.O. 1 N.C.	9007AC1			
				2 N.O. 2 N.C.	9007CC1			
Rigid Roller Lever Type	1 N.O. 1 N.C.	AB21 (RH) (3) AB22 (LH) (3) AB41 (3) (without Side Mtg. Bracket) AB23 (RH) (4) AB24 (LH) (4)	Plunger Type Panel Mounting	1 N.O. 1 N.C.	9007AP221	Mushroom Button Type Panel Mounting	1 N.O. 1 N.C.	9007AP222
				2 N.O. 2 N.C.	9007CP221		2 N.O. 2 N.C.	9007CP222
				Operator Only	9007AP201 (5)		Operator Only	9007AP202 (5)

(1) Single-pole snap switches that contain two double-break contact elements (1 N.O. and 1 N.C.) must be used on circuits of the same polarity. Two-pole snap switches contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double-break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of the same polarity.

(2) Roller turned 90° from standard (perpendicular to mounting holes).

(3) With 0.22 in. (5.6 mm) width roller.

(4) With 0.47 in. (12.0 mm) width roller.

(5) For use with Type AO and CO basic switches.

Maximum Current Ratings For Control Contacts—All Types

Switch Type	Contacts	Direct Opening Contacts Meet IEC 60947-5-1 Requirements	Voltage	AC—50 or 60 Hz Inductive power 35%				Resistive 75% Power Factor	Voltage	DC Inductive and Resistive Make and Break Amperes		AC or DC Continuous Carrying Amperes
				Make		Break				Single Pole	Double Pole	
				A	VA	A	VA	Make and Break Amperes				
AO1, AC	SPDT	No	120	40	4800	15	1800	15	125	0.5	0.25	15
	Form Z		240	20	4800	10	2400	10	250	0.25	0.1	15
	SPST (1)		480	10	4800	6	2880	6	600	0.05	—	15
	Form X or Y		600	8	4800	5	3000	5	—	—	—	15
AW, AO2 and AO6, AB, AP	SPDT	No	120	40	4800	15	1800	15	125	2	0.5	15
	Form Z		240	20	4800	10	2400	10	250	0.5	0.2	15
	SPST (1)		480	10	4800	6	2880	6	600	0.1	0.02	15
	Form X or Y		600	8	4800	5	3000	5	—	—	—	15
AW, CO3 and CO6, CB, CC CP	SPDT	No	120	40	4800	15	1800	15	125	2	0.5	15
	Form Z		240	20	4800	10	2400	10	250	0.5	0.2	15
	DPST		480	10	4800	6	2880	6	600	0.1	0.02	15
	Form AA or BB		600	8	4800	5	3000	5	—	—	—	15

Acceptable Wire Size 14–22 AWG
Recommended Terminal Clamp Torque 6–9 lb-in (0.7–1 N·m)



File E42259
CCN NKCR2



File LR25490
Class 3211-03



Marking

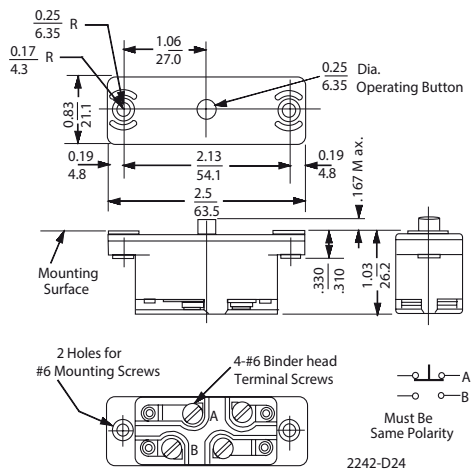
Limit switches

Snap Action Industrial Switches

Class 9007

Approximate Dimensions and Operating Data, Types AO, CO, AP, and CP

Class 9007 Type AO, Single-Pole Snap Switch

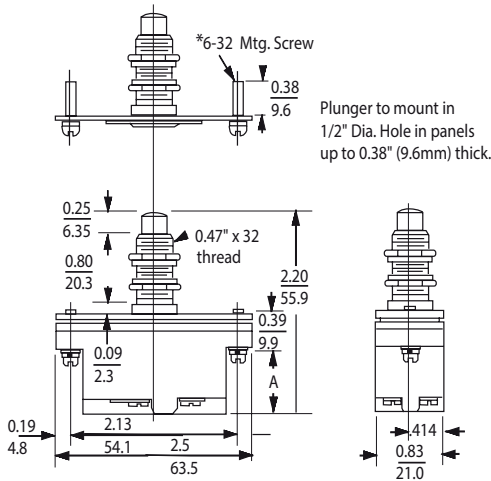


Operating Data, in. (mm)

	AO1, 1A 1B	AO2, 2A, 2B
Pre-travel	0.057–0.074 (1.4–1.8)	0.057–0.074 (1.4–1.8)
Differential	0.015–0.025 (0.6–0.6)	0.035–0.046 (0.9–1.16)
Total travel	0.103–0.125 (2.6–3.2)	0.103–0.125 (2.6–3.2)
Operating force	7–11 oz (0.05–0.08 N)	10–14 oz (0.07–0.1 N)

Separation between first and second stage trip points is 0.020–0.025 (0.5–0.6).
 Note: Shipping weight of Type AO and CO is 0.25 lb (0.11 kg).

Type AP201, 221, and CP221



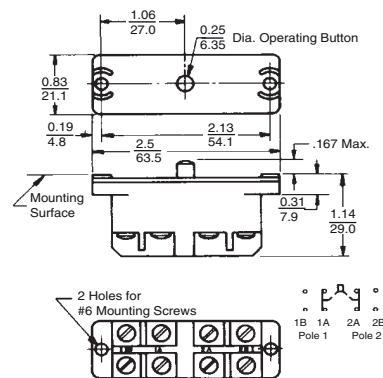
Note: Type AP221 shown.

Type	Dimension A
AP221	0.70 (17.8)
CP221	0.80 (20.3)

Operating Data, in. (mm)	AP221	CP221
Pre-travel	0.070–0.089 (1.8–2.2)	0.070–0.089 (1.8–2.2)
Differential	0.035–0.046 (0.9–1.2)	0.025–0.046 (0.9–1.2)
Total travel	0.161–0.180 (4.1–4.6)	0.161–0.180 (4.1–4.6)
Operating Force	0.231–0.269 (5.8–6.8)	0.231–0.269 (5.8–6.8)
Force	10–14 oz (0.07–0.1 N)	7–12 oz (0.05–0.08 N)

Note: Shipping weight 0.25 lb (0.11 kg).

Class 9007 Type CO, Two-Pole Snap Switch

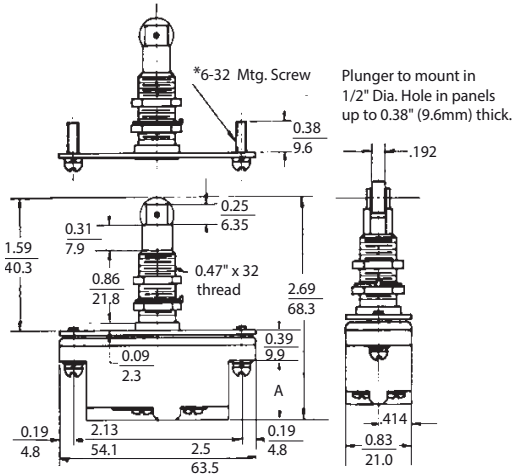


Dual dimensions: in. mm

Operating Data, in. (mm)

	CO3	CO7
Pre-travel 1st stage	0.057–0.074 (1.4–1.8)	0.035–0.060 (0.9–1.5)
Pre-travel 2nd stage	—	0.060–0.085* (1.5–2.1)
Differential	0.025–0.046 (0.6–1.16)	0.010–0.020 (0.25–0.50)
Total travel	0.103–0.125 (2.6–3.2)	—
Operating force	7–12 oz (0.05–0.084 N)	7–12 oz (0.05–0.084 N)

Type AP301, 303, 304, 305, 321, 323, 324, 325, and CP321, 323, 324, 325



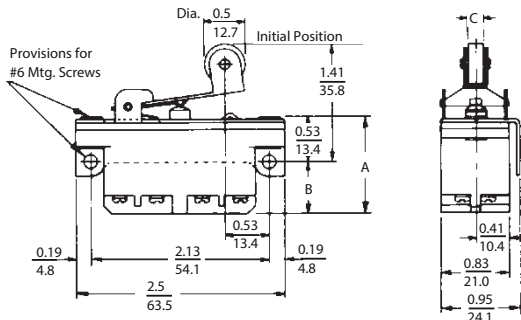
Note: Type AP321 shown.

Type	Dimension A
AP321, 323, 324, 325	0.70 (17.8)
AP321, 323, 324, 325	0.80 (20.3)

Operating Data, in. (mm)	AP231, 324	AP323, 325	CP321,324	CP323, 325
Pre-travel	0.060–0.150 (1.5–3.8)	0.060–0.150 (1.5–3.8)	0.060–0.150 (1.5–3.8)	0.060–0.150 (1.5–3.8)
Differential	0.035–0.046 (0.9–1.2)	0.035–0.046 (0.9–1.2)	0.025–0.046 (0.9–1.2)	0.035–0.046 (0.9–1.2)
Total travel	0.200–0.340 (5.1–8.6)	0.200–0.340 (5.1–8.6)	0.200–0.340 (5.1–8.6)	0.200–0.340 (5.1–8.6)
Operating force max	20 oz (0.14 N)	28 oz (0.2 N)	26 oz (0.18 N)	28 oz (0.2 N)

Approximate Dimensions and Operating Data, Types AB, CB, AC, and CC

Types AB21 through 24 and CB31 through 34



Note: Type CB31 RH mounting shown.

Type AB41 and CB41 same as above except without side mounting plates.

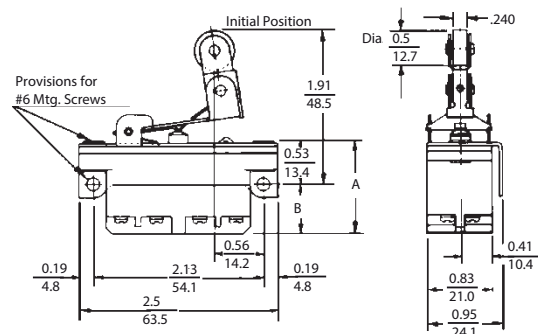
Type	Dimension		
	A	B	C
AB21, 22	1.03 (26.2)	0.5 (12.7)	0.22 (5.6)
AB23, 24	1.03 (26.2)	0.5 (12.7)	0.47 (12.0)
AB41	1.03 (26.2)	—	0.22 (5.6)
CB31, CB32	1.13 (28.7)	0.59 (15.0)	0.22 (5.6)
CB33, 34	1.13 (28.7)	0.59 (15.0)	0.47 (12.0)
CB41	1.13 (28.7)	—	0.22 (5.6)

Operating Data

Pre-travel	0.16 (4.5)
Differential	0.08 (2.0)
Overtravel	0.06 (1.5)
Total travel	0.22 (5.6)
Operating force	8 oz (0.23 kg)

Note: Shipping weight 0.25 lb (0.11 kg).

Types AB25, 26 and CB35, 36



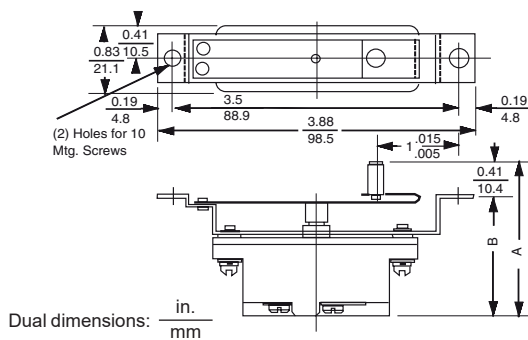
Note: Type CB35 mounting shown.

Type	Dimension		
	A	B	C
AB25, 26	1.03 (26.2)	0.5 (12.7)	0.22 (5.6)
CB35, 36	1.13 (28.7)	0.59 (15.0)	0.22 (5.6)

Operating Data

Pre-travel	0.16 (4.5)
Differential	0.08 (2.0)
Overtravel	0.06 (1.5)
Total travel	0.22 (5.6)
Operating force	8 oz (0.23 kg)

Type AC1 and CC1



Dual dimensions: in. mm

Type	Dimension	
	A	B
AC1	1.91 (48.5)	1.5 (38.1)
CC1	2 (50.8)	1.59 (40.4)

Operating Data	Type	
	AC1	CC1
Pre-travel	0.16 (4.5)	0.16 (4.5)
Differential	0.05 (1.3)	0.07 (1.8)
Overtravel	0.09 (2.3)	0.09 (2.3)
Total travel	0.25 (6.4)	0.25 (6.4)
Operating force	8 oz (0.23 kg)	8 oz (0.23 kg)

Note: Shipping weight 0.25 lb (0.11 kg).

Limit switches

Miniature

Class 9007 Type MS and ML



Description

Application information

Mini-Switch (MS) miniature switches meet the need for very small, enclosed switches with environmental sealing. A full range of styles are available, including top push plunger, parallel roller plunger, cross roller plunger, rotary lever, and omnidirectional whisker. Factory prewiring with industrial grade cable (type SJTO) eliminates the need to remove the cover to wire the switch. Bottom- or side-entrance cable connection is available.

Housings are rugged diecast zinc construction. Excellent sealing is achieved with an epoxy compound encapsulation of the electrical cable connections and switch housing. A Viton® O-ring seal on the plunger keeps liquids from entering the switch cavity.

Features

The heavy-duty, completely encapsulated miniature MS limit switch is intended for difficult applications such as machine tools, earth moving equipment, and general transportation.

Key features include:

- Symmetrical design and top mounting holes for easy gang mounting of several switches for multiple switching
- Epoxy encapsulation sealing the pre-wired heavy duty #18 AWG SJTO cable and protecting against temporary submersion
- Single-pole double-throw (SPDT) Form C or Form Z, 1 N.O. + 1 N.C. contact
- Fine rotary lever adjustment
- Compact diecast zinc housing
- NEMA Type 6P and IP67 rated
- 10 ampere continuous current rating
- Gold contacts for low level logic switching
- Stainless steel rollers
- UL Listed and CSA Certified
- CE Marking
- Standard temperature range: -40 to +220 °F (-40 to +104 °C)

Options

- Gold crosspoint contacts
- Double-break contacts (Type ML only)
- Side-entrance cable or connectors
- Low force (top plunger models only)
- Yellow or gray SJTO cable
- 4- or 5-pin micro-connectors, AC and DC
- #16 AWG SJTO cable
- Tapped 8-32 holes on top of housing

Rotary Head

Conventional rotary limit switches have mounting holes in the base or body of the switch. In our rotary design, mounting holes are located in the head also. Cycling and stress forces are transmitted from the shaft in the head directly to the mounting bolts. The strain on the joint between the body and the head is eliminated. The result is a stronger and more rigid mounting, less subject to vibration or a weakness in the joint.

Bulkhead Mounted Mini-Switches

The MS housing is designed for multiple switching by gang mounting several switches.

Two mounting holes can be tapped in the top of each switch (except rotary lever) for #8-32 thread bolts. Switches can be readily mounted to any frame or plate by drilling holes through same to accommodate #8-32 bolts and switch plungers. Both sides of the housing are counter-bored for surface mounting.



File E42259
CCN NKCR



File LR 25490
Class 3211 03



Marking

Limit switches

Miniature

Class 9007 Type MS and ML



Shown with Side-Entrance Cable

- 0.98 in. (25 mm) Mounting Hole Centers
- 3 ft (0.9 m) Cable, Standard
- For other available lengths, and for a list of options

General Specifications	
Temperature range	-40 to +220 °F (-40 to +104 °C) The minimum temperatures listed are based on the absence of freezing moisture or water.
Enclosure rating	NEMA Types 1, 2, 4, 6, 6P, 12, 13, IP67
Vibration resistance	10G (75–1200 Hz)
Shock resistance	35G
Cable	#18 AWG SJTO

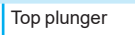
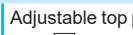
Contact Characteristics	
Rated thermal current	10 A (standard)
Rated insulation voltage	300 Vac and Vdc (standard)
Gold contact switching ratings	0.1 A, 24 Vdc; 0.24 VA

Type MS Circuit — Form C	Electrical Ratings/SPDT		
	Silver Contacts		Gold Contacts
	Voltage	Make	Break
	120 AC	60 A	6 A
	240 AC	30 A	3 A
10.0 Amperes Continuous			
DC Contact Rating: 5 A (Resistance), 28 Vdc			

Type ML Circuit — Form Z	Electrical Ratings/SPDT-DB		
	Silver Contacts		Break
	Voltage	Make	Break
	120 AC	60 A	6 A
	240 AC	30 A	3 A
10.0 Amperes Continuous			
DC Contact Rating: 5 A (Resistance), 28 Vdc			

Description / Functional Diagrams

Top Plunger

MS		ML		MS		ML		MS		ML	
											
Operating Force/Torque				80 oz (0.6 N)							
Contact				SPDT							
Form				Form C		Form Z		Form C		Form Z	
Contact type		Silver		9007MS01S0100		9007ML01S0100		9007MS06S0100		9007ML06S0100	
		Gold		9007MS01G0100		—		9007MS06G0100		—	

Parallel roller plunger

MS		ML		MS		ML	

Cross roller plunger

MS		ML		MS		ML			
Operating Force/Torque		80 oz (0.6 N)							
Contact		SPDT							
Form		Form C		Form Z		Form C		Form Z	
Contact type	Silver	9007MS03S0100	9007ML03S0100	9007MS08S0100	9007ML08S0100				
	Gold	9007MS03G0100	—	9007MS08G0100	—				

Rotary lever, CW and CCW

MS	ML	MS	ML	MS
Operating Force/Torque		48 oz-in (0.3 N·m)		15 oz-in (0.1 N·m)
Contact		SPDT		
Form		Form C	Form Z	Form C
Contact type	Silver	9007MS04S0100	9007ML04S0100	9007MS05S0100
	Gold	9007MS04G0100	—	9007MS05G0100

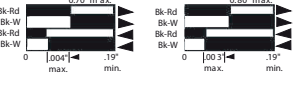
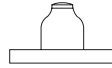
Omnidirectional — wire whisker (NEMA Types 1, 2, 12, 13 only)

Limit switches

Miniature

Class 9007 Type MS and ML

Description / Functional Diagrams

Booted Devices							
MS		ML		MS		ML	
				Booted top plunger		Booted parallel roller plunger	
							
Operating Force/Torque		80 oz (0.6 N)					
Contact		SPDT					
Form		Form C	Form Z	Form C	Form Z	Form C	Form Z
Contact type	Silver	9007MS10S0100	9007ML10S0100	9007MS12S0100	9007ML12S0100	9007MS13S0100	9007ML13S0100
	Gold	9007MS10G0100	—	9007MS12G0100	—	9007MS13G0100	—

Lever Arm Selection



There are many styles of levers to accommodate most industrial applications. The levers are diecast metal. The standard roller levers are available with nylon rollers and are also available with steel rollers. See the tables below. Dimensions are given as in. (mm).

Style 7 Levers—0.75 in. (19 mm) diameter, nylon or steel roller

Length		Catalog Number 0.25 (6) Wide		Catalog Number 0.5 (13) Wide		Catalog Number 0.5 (13) Wide		Catalog Number 1 (25) Wide	
in.	mm	Nylon	Steel	Nylon	Steel	Nylon	Steel	Nylon	Steel
0.875	22.23	7A2N	7A2	7B2N	7B2	7F2N	—	7J2N	—
1.375	34.93	7A3N	—	7B3N	—	7F3N	—	7J3N	—
1.5	38.10	7A1N	7A1	7B1N	—	7F1N	—	7J1N	—
1.75	44.45	7A7N	—	7B7N	—	7F7N	—	7J7N	—
2.00	50.8	7A4N	—	7B4N	—	7F4N	—	7J4N	—

Style 7X Levers—0.75 in. (19 mm) diameter, nylon or steel roller

Length		Catalog Number 0.25 (6) Wide		Catalog Number 0.5 (13) Wide		Catalog Number 0.5 (13) Wide		Catalog Number 1 (25) Wide	
in.	mm	Nylon	Steel	Nylon	Steel	Nylon	Steel	Nylon	Steel
0.875	22.23	7XA2N	7XA2	7XB2N	7XB2	7XF2N	—	7XJ2N	—
1.375	34.93	7XA3N	—	7XB3N	—	7XF3N	—	7XJ3N	—
1.5	38.10	7XA1N	7XA1	7XB1N	—	7XF1N	—	7XJ1N	—
1.75	44.45	7XA7N	—	7XB7N	—	7XF7N	—	7XJ7N	—
2.00	50.8	7XA4N	—	7XB4N	—	7XF4N	—	7XJ4N	—

Specialty Arms and Options

Description	Length	Diameter	Width	Catalog Number
Style 7D adjustable length, metal roller	1.38 to 3.38 (35 to 85.8)	0.75 (19)	0.25 (6.35)	7D
Style 7D adjustable length, nylon roller	1.38 to 3.38 (35 to 85.8)	0.75 (19)	0.25 (6.35)	7DN
Style 7S spring nylon rod	6 (152.4)	0.3 (7.6)	—	7S
Style 7N nylon rod	5 (127)	0.3 (7.6)	—	7N

Corrosion proof (option available with nylon rollers only) — Suffix to add to the end of catalog number

S

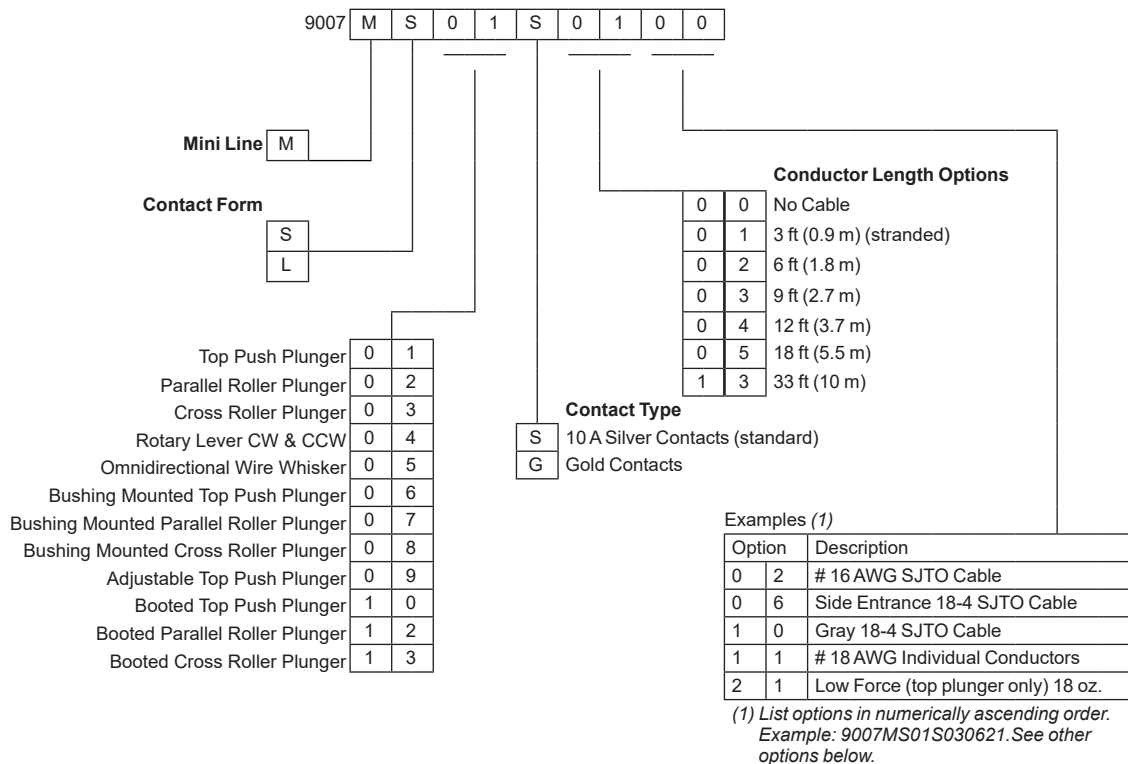
Lever tightening torque for mounting the lever on the shaft: minimum 17 lb-in (1.9 N•m).

Catalog Number Interpretation and Options

For Interpretation of the Catalog Number Only



9007MS02 Shown
with M12 Connector



Conductor Length	Designator (2)
No cable	00
3 ft (0.9 m)—standard	01
6 ft (1.8 m)	02
9 ft (2.7 m)	03
12 ft (3.7 m)	04
18 ft (5.5 m)	05
33 ft (10 m)	13

Note: For other cabling options, please refer to your local Customer Care Center.

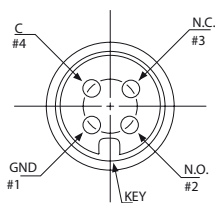
MS Options (Does not apply to ML except where noted)	Designator (2)
#16 AWG SJTO cable	02
Side entrance, #18 AWG SJTO cable, or Connector 12, 54, 55, 82, 84 (3)	06
Gray #18 AWG SJTO cable	10
#18 AWG individual conductors	11
Male 4-pin micro-connector with 3 ft (0.9 m) cable (MS only)	12
Low force (NEMA Type 1 only) 18 oz.	21
High Pre-Travel—adds 0.030	30
Male 4-pin micro-connector in housing (DC type) (4) (no cable) (MS only)	54
Male 5-pin micro-connector in housing (DC type) (4) (no cable) (ML only)	55
Tapped holes in top of plunger style housing (MS and ML)	81
Male 4-pin micro-connector in housing (AC type) (no cable) (MS only)	82
Black 18/5 SJTO Cable (ML only)	83
Male 4-pin micro-connector in housing (AC type) (no cable) (MS only)	84

(2) Ex: 9007MS01S0100 with a 9 ft (2.7 m) cable becomes 9007MS01S0300. 9007MS01S0100 with side entrance becomes 9007MS01S0106.

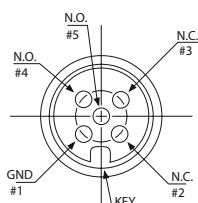
(3) For side entry connectors, include 06, then 12, 54, 55, 82, or 84; otherwise the connector will come from bottom of housing. Example of catalog no. with side entrance connector: 9007MS01S000654. No cable available with 54 and 55. Option 12 is supplied with 3 ft (0.9 m) of cable.

(4) DC connectors are rated 3 A, 250 Vac/Vdc.

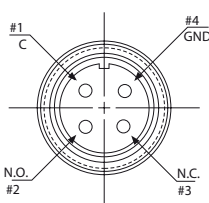
Male Plug (face) Pin-outs



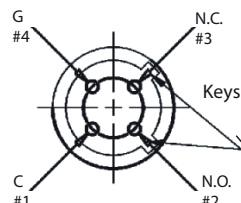
Option 54 (MS only)



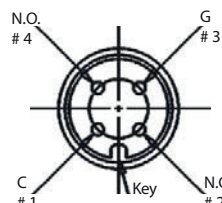
Option 55 (ML only)



Option 12 (MS only)



Option 82 (MS only)



Option 84 (MS only)

Limit switches

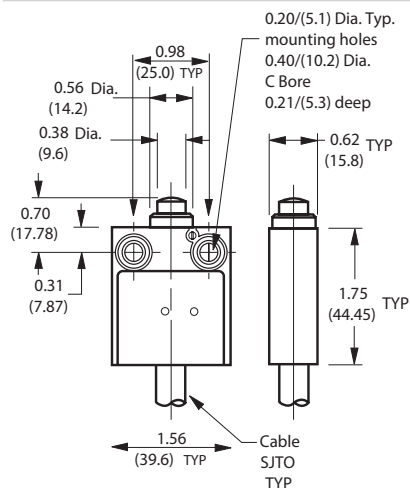
Miniature

Class 9007 Type MS and ML

Dimensions

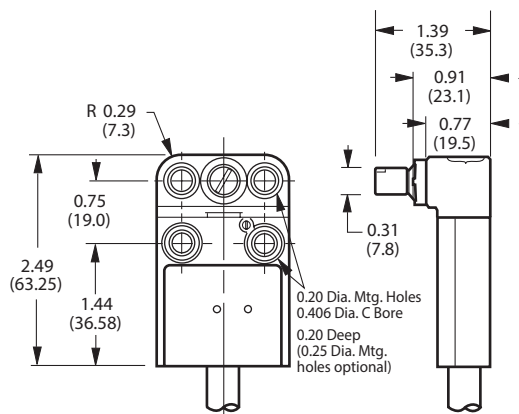
Top Push Plunger

MS01, MLO1



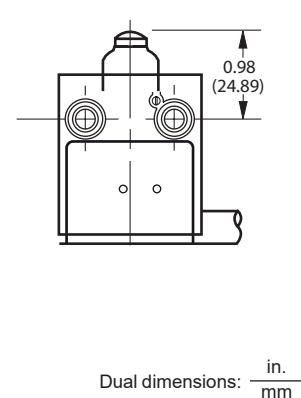
Rotary Lever

MSO4, ML04



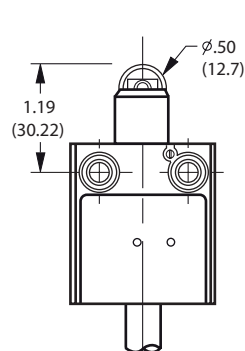
Booted Top Push Plunger with Mid-Side Entry Cable

MS10, ML10



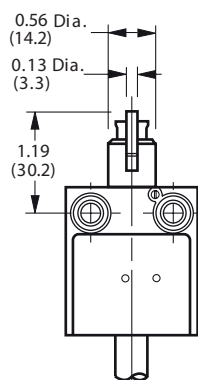
Parallel Roller Plunger

MS02, ML02



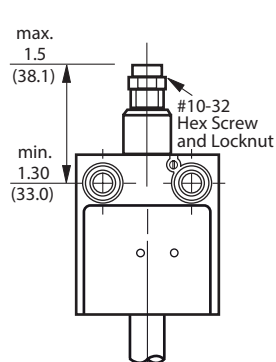
Cross Roller Plunger

MS03, ML03



Adjustable Top Push Plunger

MS09, ML09

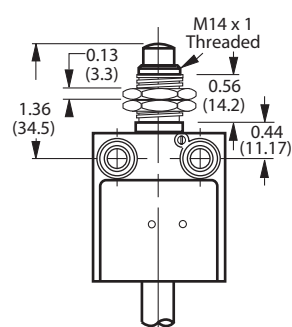


Omnidirectional

MS05, ML05

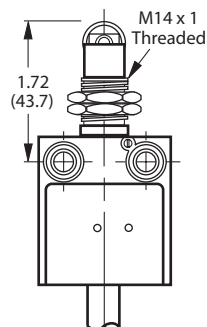
Bushing Mounted Top Push Plunger

MS06, ML06



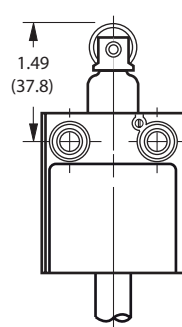
Bushing Mounted Parallel Roller Plunger

MS07, ML07



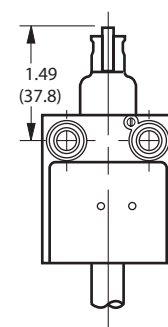
Parallel Booted Roller Plunger

MS12, ML12



Cross-Booted Roller Plunger

MS13, ML13





Lever Arm Type



Plunger Type

Lever Arms And Plunger Types

Select Switch		Select Operator		
Mounting	Contacts	Lever Arm Type Without Lever Arm. Select from CCW Operation (1)	Roller Plunger Type With Micrometer Adjustment	Push Rod Plunger Type With Micrometer Adjustment
Surface Mounting Plug-in	1 N.O.—1 N.C.	9007AW16	9007AW36	9007AW46
	2 N.O.	(2)	—	—
	2 N.C.	9007AW19 (2)	—	—
Surface Mounting Nonplug-in Standard Box	1 N.O.—1 N.C.	9007AW12	9007AW32	9007AW42
Surface Mounting Nonplug-in Deep Box	1 N.O.—1 N.C.	9007AW14	—	—
	2 N.O.—2 N.C.	9007AW18	9007AW38	—
Open Type (Without Box) Plug-in	1 N.O.—1 N.C.	9007AO16	9007AO36	—
	2 N.O.	(2)	—	—
	2 N.C.	(2)	—	—
Open Type (Without Box) Nonplug-in	1 N.O.—1 N.C.	9007AO12	—	—
	2 N.O.—2 N.C.	9007AO18	—	—
Flush Mounting	1 N.O.—1 N.C.	9007AF12	—	—

Nominal Operating Data in. (mm)	Pre-travel	5°	0.09 (2.3)	0.09 (2.3)
	Total-travel	30°	0.25 (6.3) ±0.06 (1.5) Adjustable	0.25 (6.3) ±0.06 (1.5) Adjustable
	Differential	2.5°	0.05 (1.3)	0.05 (1.3)
	Reverse Overtravel	25°	—	—
	Operating Torque or force	2.75 lb-in (0.31 N•m)	3 lb-in (0.34 N•m)	3 lb-in (0.34 N•m)
	Repeat Accuracy	±0.002 (0.05) Linear travel of cam on 1.38 (35) lever arm	±0.001 (0.02)	±0.001 (0.02)

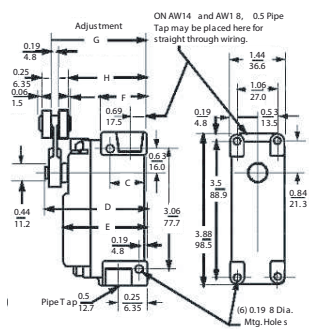
(1) Field convertible to CW operation. 9007MS01S0106.

(2) 2 N.O. contact only when Type AW19 is operated in clockwise direction. 2 N.C. contacts only when Type AW19 is operated in counterclockwise direction.

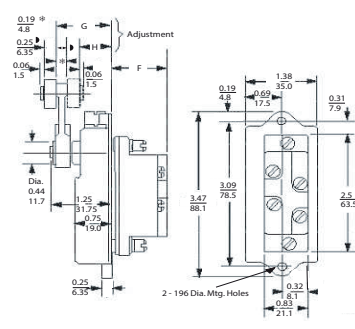
Lever arms, see page 43 to 48.

Approximate dimensions

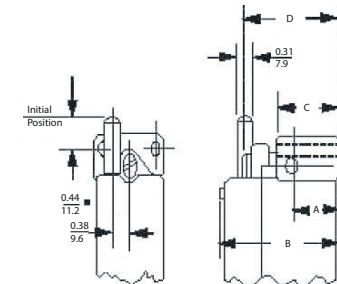
Type AW



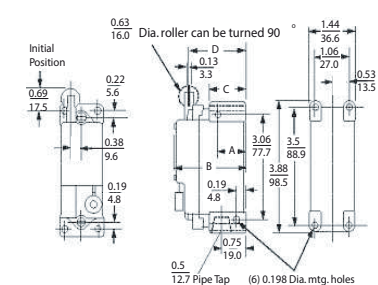
Type AO



Type AW42, 46, 48 and 49



Type AW32, 36, and 38



Type	C	D	E	F	G	H
AW12	0.31 (7.9)	2.69 (68.3)	2.19 (56)	1.16 (29.4)	2.5–2.56 (63.5–65)	2.06–2.13 (52.3–54)
AW14	1.25 (32)	3 (76)	2.5 (63.5)	1.47 (37)	2.81–2.88 (71–73)	2.38–2.44 (60–62)
AW16						
AW18						
AW19						
AO12	—	—	—	1.03 (26)	1.06–1.13 (27–29)	0.63–0.69 (16–17.5)
AO18	—	—	—	1.03 (26)	1.06–1.13 (27–29)	0.63–0.69 (16–17.5)

Type	A	B	C	D
AW32 and AW42	0.31 (7.9)	2.22 (56)	1.16 (29.4)	1.81 (46)
AW36, 38, 46, 48 and 49	1.25 (32)	2.53 (64)	1.47 (37.3)	2.13 (54)

Limit switches

9007C Heavy Duty Industrial
Plug-in Body, Metal
Standard and Compact

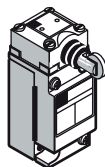
Standard plug-in body type

with one cable entry (1)

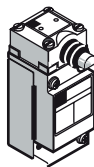
The standard plug-in body types with one cable entry are also available with reed contacts

With head for linear movement

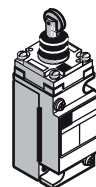
Side plunger



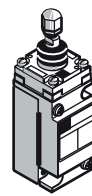
Page 21



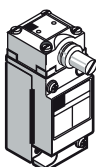
Top plunger



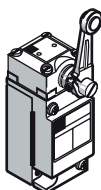
Page 22



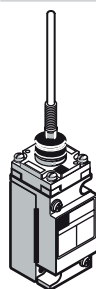
With head for rotary movement (lever)



Page 23



With head for multi-directional movement



Page 24

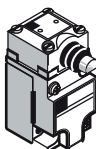


Compact plug-in body type

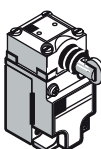
with one cable entry (1)

With head for linear movement

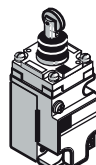
Side plunger



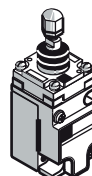
Page 25



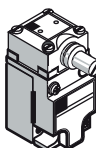
Top plunger



Page 26

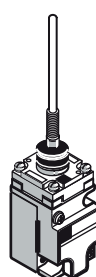


With head for rotary movement (lever)



Page 27

With head for multi-directional movement



Page 28



(1) For any factory modifications requirements, please refer to your local Customer Care Center.

Environmental characteristics

Conforming to standards	Products	NEMA 250, EN 60947-1, EN 60947-5-1, IEC 60947, UL 508, C22-2-14-95, e conformity documentation
Product certifications		UL, CSA, CE
Protective treatment		Epoxy powder coat (additional protection available)
Ambient air temperature	Operation	-20...+185 °F (-28.9...+85 °C), wider range available
	Storage	-20...+185 °F (-28.9...+85 °C), wider range available
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...150 Hz, 11 ms) (Reed switch good for 18.5g only)
Shock resistance	Conforming to IEC 60068-2-27	60 gn (9 ms) 40 gn (9 ms) for reed switch
Electric shock protection	Conforming to IEC 61140	Class 0
Degree of protection	Conforming to IEC 60529	IP 67
Cable entry or connector (1)	Depending on model	1/2-14 NPT, M20 x 1.5, ISO cable entry, 5-pin mini connector, 4-pin micro connector
Materials	Bodies, heads, levers	Bodies and heads in Zamak® zinc alloy, levers and rods in zinc, steel, stainless steel, Delrin® resin.

(1) A wide range of connectors are available. Contact your local field office.

Contact block characteristics

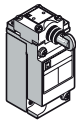
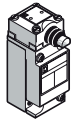
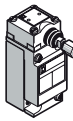
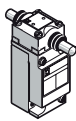
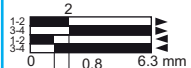
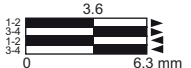
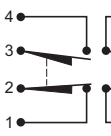
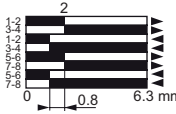
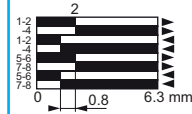
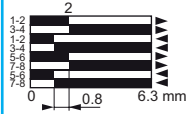
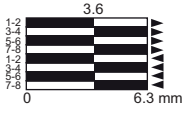
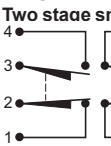
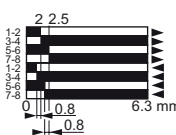
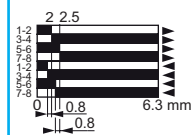
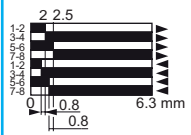
Rated operational characteristics hard contacts -AC Voltage (top half of body)	9007CO52 (compact single)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CO54 (single pole)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CO62 (two pole)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CO66 (two pole two stage)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CO68 (two pole neutral)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
Reed switches, complete body	9007C84 (1 N.O.)	NEMA C600 (Ue = 600 V, Ie = 0.3 A); Ithe = 2.5 A
	9007C86 (1 N.C.)	NEMA C600 (Ue = 600 V, Ie = 0.3 A); Ithe = 2.5 A
Rated operational characteristics hard contacts -DC Voltage (top half of body)	9007CO52 (compact single)	NEMA Q600 (Ue = 600 V, Ie = 0.1 A); Ithe = 2.5 A
	9007CO54 (single pole)	NEMA Q600 (Ue = 600 V, Ie = 0.1 A); Ithe = 2.5 A
	9007CO62 (two pole)	NEMA R300 (Ue = 250 V, Ie = 0.11 A); Ithe = 1.0 A
	9007CO66 (two pole two stage)	NEMA R300 (Ue = 250 V, Ie = 0.11 A); Ithe = 1.0 A
	9007CO68 (two pole neutral)	NEMA R300 (Ue = 250 V, Ie = 0.11 A); Ithe = 1.0 A
Reed switches, complete body	9007C84 (1 N.O.)	NEMA Q150 (Ue = 125 V, Ie = 0.55 A); Ithe = 2.5 A
	9007C86 (1 N.C.)	NEMA Q150 (Ue = 125 V, Ie = 0.55 A); Ithe = 2.5 A
Rated insulation voltage		600 V
Rated impulse withstand voltage		2,500 Vac for 1 minute for CE; 2,200 Vac for 1 minute for UL; and 2,640 Vac for 1 s for CSA
Positive opening	Special Y1561	Special Y1561 (one pole slow break only) ☹
Short circuit protection		10 A. Bussmann Class CC KTK-R-10 fuse non-time-delay
Terminal wire sizes (cabling/screw clamp)		1 or 2, 12-22 AWG (2.05-0.644 mm ²) wires maximum
Maximum actuation speed		15.2 mpm / 27.4 mpm (50 fpm / 90 fpm) with 45 degree cam angle, levers only
Electrical durability		1 million operating cycles

Types of contact elements

	IEC 60947-5-1			NEMA			JIS		
	Form	Symbol	Description	Form	Symbol	Description	Form	Symbol	Description
Example: 9007C54 single-pole limit switch, Form Z, same polarity	A		Single break	A		—	3		—
	X		Single break	B		—	2		Double break
	B		Single break	C		—	1		Double break
	Y		—						Single break
	C		—						—
	Za		Same polarity	Z		"Same polarity" only			Double break
	Zb		Electrically separate						

Limit switches

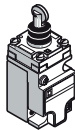
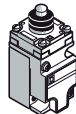
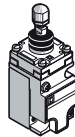
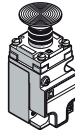
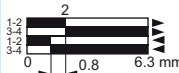
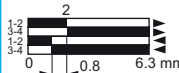
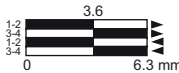
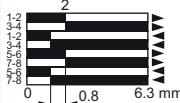
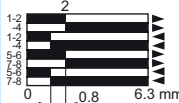
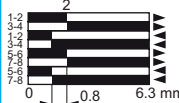
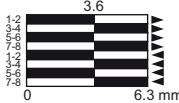
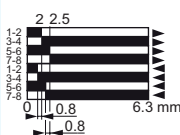
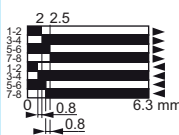
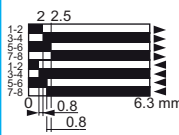
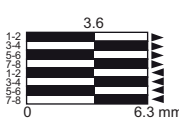
9007C Heavy Duty Industrial
Plug-in Body, Metal
Standard Body

Type of head		Side Plunger (mounting by the body)				
Standard plug-in body type						
Type of operator		Side roller plunger, spring return, vertical roller (1)	Side push rod plunger, spring return	Side push rod plunger, adjustable (2) spring return	Side push rod plunger, maintained contact	
Catalog numbers						
1 N.O. 1 N.C. snap action		 1 2 3 4	 2 0 0.8 6.3 mm	 2 0 0.8 6.3 mm	 2 0 0.8 6.3 mm	 3.6 0 6.3 mm
2 N.O. 2 N.C. snap action		 1 2 3 4 5 6 7 8	 2 0 0.8 6.3 mm	 2 0 0.8 6.3 mm	 2 0 0.8 6.3 mm	 3.6 0 6.3 mm
2 N.O. 2 N.C. Two stage snap action		 1 2 3 4 5 6 7 8	 2 2.5 0 0.8 0.8 6.3 mm	 2 2.5 0 0.8 0.8 6.3 mm	 2 2.5 0 0.8 0.8 6.3 mm	
Weight, kg (lb)		0.568 (1.25)		0.568 (1.25)		0.568 (1.25)
Contact operation		 contact closed  contact open				
Characteristics (nominal operating data)						
Switch actuation		On end				
Type of actuation						
Pre-travel		2 mm (0.08 in.)				3.6 mm (0.14 in.)
Pre-travel two Stage	First stage	2 mm (0.08 in.)				
	First stage to second stage	0.5 mm (0.02 in.)				
Total travel		6.3 mm (0.25 in.)				
Differential		0.8 mm (0.03 in.)				
Reverse overtravel		—				
Minimum force or torque		1 pole & 2 pole 4 lb (17.8 N)				7 lb (31.1 N)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum				
Repeatability (linear travel of cam)		0.03 mm (0.001 in.)				—
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry				

- (1) Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter H at the end of the equivalent vertical roller version type.
 (2) To lock the nut in the desired position, crimp the slot near the bottom of the nut

Limit switches

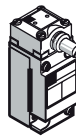
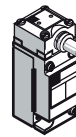
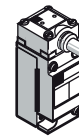
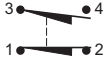
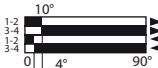
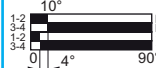
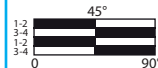
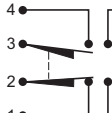
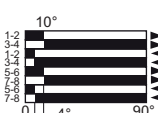
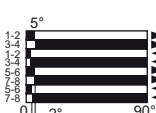
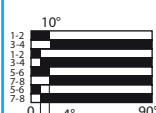
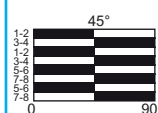
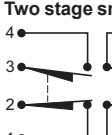
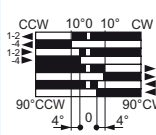
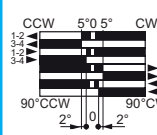
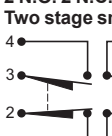
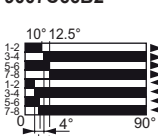
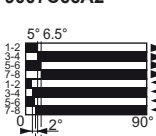
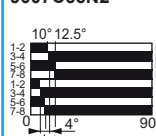
9007C Heavy Duty Industrial
Plug-in Body, Metal
Standard Body

Type of head		Top (mounting by the body)			
Standard plug-in body type					
Type of operator		Top roller plunger spring return	Top push rod plunger spring return	Top push rod plunger adjustable (1) spring return	Palm operated (2)
Catalog numbers					
1 N.O. 1 N.C. snap action					
2 N.O. 2 N.C. snap action					
2 N.O. 2 N.C. Two stage snap action					
Weight, kg (lb)		0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)
Contact operation		 contact closed  contact open			
Characteristics (nominal operating data)					
Switch actuation		On end			
Type of actuation					
Pre-travel		2 mm (0.08 in.)			3.6 mm (0.14 in.)
Pre-travel two Stage	First stage	2 mm (0.08 in.)			
	First stage to second stage	0.3 mm (0.01 in.)			
Total travel		6.3 mm (0.25 in.)			
Differential		0.5 mm (0.02 in.)			
Reverse overtravel		—			
Minimum force or torque 1 pole & 2 pole		3 lb (13.3 N)			7 lb (31.1 N)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22AWG (2.05–0.644 mm²) wires maximum			
Repeatability (linear travel of cam)		0.03 mm (0.001 in.)			—
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry			

(1) Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter H at the end of the equivalent vertical roller version type.
 (2) To lock the nut in the desired position, crimp the slot near the bottom of the nut.

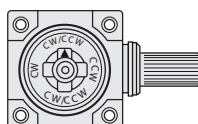
Limit switches

9007C Heavy Duty Industrial
Plug-in Body, Metal
Standard Body

Type of head		Rotary (lever arm type) (1)					
Standard plug-in body type							
Type of operator		Standard pre-travel, spring return	Low differential, spring return	Neutral position Standard pre-travel, spring return Low differential, spring return		Light operating torque spring return	Maintained contact
Type of direction		CW & CCW (2)	CW & CCW (2)	CW & CCW	CW & CCW	CW & CCW (2)	CW (trip) CCW (reset)
Catalog numbers							
1 N.O. 1 N.C. snap action 		9007C54B2 	9007C54A2 			9007C54N2 	9007C54C 
2 N.O. 2 N.C. snap action 		9007C62B2 	9007C62A2 			9007C62N2 	9007C62C 
2 N.O. 2 N.C. Two stage snap action 				9007C68T10 	9007C68T5 		
2 N.O. 2 N.C. Two stage snap action 		9007C66B2 	9007C66A2 			9007C66N2 	
Weight, kg (lb)		0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)
Contact operation		 contact closed		 contact open			
Characteristics (nominal operating data)							
Switch actuation		By 30° cam					
Type of actuation							
Pre-travel		10°	5°	10°	5°	10°	45°
Pre-travel two Stage	First stage	10°	5°	—	—	10°	—
	First stage to second stage	2.5°	1.5°	—	—	2.5°	—
Total travel		90°					
Differential		4°	2°	4°	2°	4°	—
Reverse overtravel		90°					
Operating torque/force 1 pole & 2 pole		4 lb-in (0.45 N•m) 7 lb (31.1 N)				25 oz-in (0•18 N•m)	3 lb-in (0.34 N•m)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm ²) wires maximum					
Repeatability (linear travel of cam)		0.05 mm (±0.002 in.)	0.03 mm (±0.001 in.)	0.05 mm (±0.002 in.)	0.05 mm (±0.002 in.)	0.05 mm (± .002 in.)	0.05 mm (±0.002 in.)
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry					

(1) Lever arm type must be ordered separately from page 43 to 48.

(2) These devices are factory set to operate the contacts in **both** the **CW** and **CCW** directions. **Mode of operation** is field convertible to CW only or CCW only. To order factory converted devices: For CCW only operation, change the 2 at the end of the Type number to 1 (for example, C54B2 becomes C54B1). For CW only operation, delete the 2 at the end of the Type number (for example C54B2 becomes C54B).



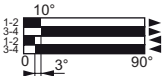
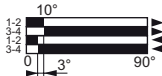
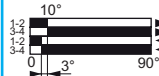
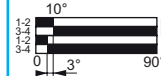
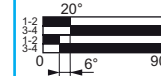
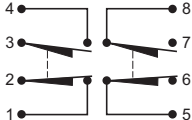
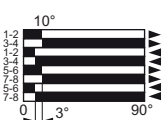
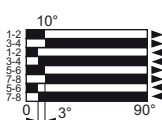
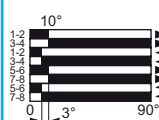
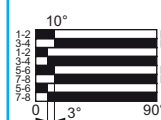
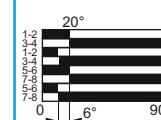
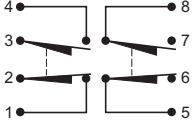
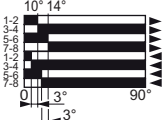
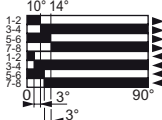
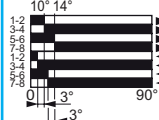
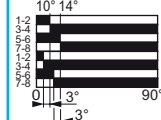
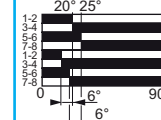
Mode of operation of the lever arm is easily convertible to clockwise or both.

Simply pull out and rotate the arrow to the letters representing the desired direction—CW, CCW, or CW/CCW.

Dimensions:
page 35 to 38

Limit switches

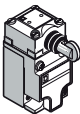
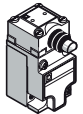
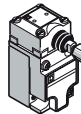
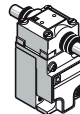
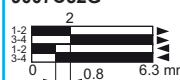
9007C Heavy Duty Industrial
Plug-in Body, Metal
Standard Body

Type of head	Flexible operator (wobble stick)					
Standard plug-in body type						
Type of operator	Universal (1)	Wobble stick Delrin® extension (1)	Wobble stick wire extension (1)	Wobble stick coil spring extension (1)	Cat whisker	
Catalog numbers						
1 N.O. 1 N.C. snap action 	9007C54JKC 	9007C54J 	9007C54K 	9007C54KC 	9007C54L 	
2 N.O. 2 N.C. snap action 	9007C62JKC 	9007C62J 	9007C62K 	9007C62KC 	9007C62L 	
2 N.O. 2 N.C. Two stage snap action 	9007C66JKC 	9007C66J 	9007C66K 	9007C66KC 	9007C66L 	
Weight, kg (lb)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	0.568 (1.25)	
Contact operation	 contact closed  contact open					
Characteristics (nominal operating data)						
Switch actuation	Object from any direction					
Type of actuation						
Pre-travel	10° (any direction)				20°	
Pre-travel two Stage	First stage	10° (any direction)				20°
	First stage to second stage	4°				5°
Total travel	90°					
Differential	3°				6°	
Reverse overtravel	—					
Operating torque/force 1 pole & 2 pole	3 lb-in (0.34 N•m)				7 oz-in (0.05 N•m)	
Terminal wire sizes (Cabling/Screw Clamp)	1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum					
Repeatability (linear travel of cam)	—					
Cable entry	1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry					

(1) Wobble stick extensions are available separately for the universal head. See page 42.

Limit switches

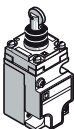
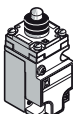
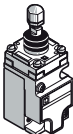
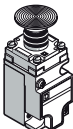
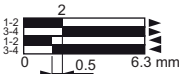
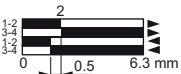
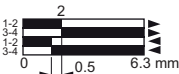
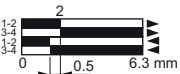
9007C Heavy Duty Industrial
Plug-in Body, Metal
Compact Body

Type of head		Side Plunger (mounting by the body)			
Compact plug-in body type					
Type of operator		Side roller, plunger spring, returnvertical roller (1)	Side push rod plunger, spring return	Side push rod plunger, adjustable (2), spring return	Side push rod plunger, maintained contact
Catalog numbers					
1 N.O. 1 N.C. snap action 		9007C52F 	9007C52G 	9007C52GD 	9007C52H 
Weight, kg (lb)		0.456 (1.01)	0.445 (0.98)	0.422 (0.93)	0.568 (1.25)
Contact operation					
Characteristics (nominal operating data)					
Switch actuation		On end			
Type of actuation					
Pre-travel		2 mm (0.08 in.)			3.6 mm (0.14 in.)
Pre-travel two Stage	First stage	2 mm (0.08 in.)			—
	First stage to second stage	0.5 mm (0.02 in.)			—
Total travel		6.3 mm (0.25 in.)			—
Differential		0.8 mm (0.03 in.)			—
Reverse overtravel		—			
Minimum force or torque 1 pole & 2 pole		4 lb (17.8 N)			7 lb (31.1 N)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum			
Repeatability (linear travel of cam)		0.03 mm (0.001 in.)			—
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry			

(1) Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter H at the end of the equivalent vertical roller version type.
(2) To lock the nut in the desired position, crimp the slot near the bottom of the nut.

Limit switches

9007C Heavy Duty Industrial
Plug-in Body, Metal
Compact Body

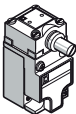
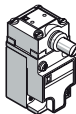
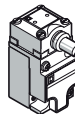
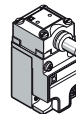
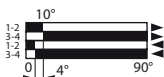
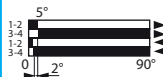
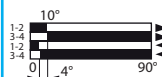
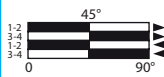
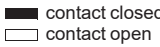
Type of head		Top Plunger (mounting by the body)			
Compact plug-in body type					
Type of operator	Top roller plunger, spring return	Top push rod plunger, spring return	Top push rod plunger, adjustable (1) spring return	Palm operated (2)	
Catalog numbers					
1 N.O. 1 N.C. snap action 	9007C52D 	9007C52E 	9007C52ED 	9007C52R (2) 	
Weight, kg (lb)	0.169 (0.43)	0.169 (0.43)	0.422 (0.93)	0.568 (1.25)	
Contact operation	 contact closed  contact open				
Characteristics (nominal operating data)					
Switch actuation	On end				
Type of actuation					
Pre-travel	2 mm (0.08 in.)				
Pre-travel two Stage	First stage	2 mm (0.08 in.)			
	First stage to second stage	0.3 mm (0.01 in.)			
Total travel	6.3 mm (0.25 in.)				
Differential	0.5 mm (0.02 in.)				
Reverse overtravel	—				
Minimum force or torque 1 pole & 2 pole	3 lb (13.3 N)				
Terminal wire sizes (Cabling/Screw Clamp)	1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum				
Repeatability (linear travel of cam)	0.03 mm (0.001 in.)				
Cable entry	1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry. Prewired options available.				

(1) To lock the nut in the desired position, crimp the slot near the bottom of the nut.

(2) Does not include mushroom button. Must be ordered separately see page 42.

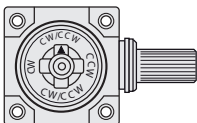
Limit switches

9007C Heavy Duty Industrial
Plug-in Body, Metal
Compact Body

Type of head		Rotary (lever arm type) (1)			
Compact plug-in body type					
Type of operator		Standard pre-travel spring return	Low differential spring return	Light operating torque spring return	Maintained contact
Type of direction		CW & CCW (2)	CW & CCW (2)	CW & CCW (2)	CW (trip) CCW (reset)
Catalog numbers					
1 N.O. 1 N.C. snap action					
Weight, kg (lb)		0.481 (1.06)	0.481 (1.06)	0.481 (1.06)	0.481 (1.06)
Contact operation		 contact closed contact open			
Characteristics (nominal operating data)					
Switch actuation		By 30° cam			
Type of actuation					
Pre-travel		10°	5°	10°	45°
Pre-travel two Stage	First stage	10°	5°	10°	—
	First stage to second stage	2.5°	1.5°	2.5°	—
Total travel		90°	90°	90°	90°
Differential		4°	2°	4°	—
Reverse overtravel		90°	90°	90°	—
Operating torque/force 1 pole & 2 pole		4 lb-in (0.45 N•m)		25 oz-in (0.18 N•m)	3 lb-in (0.34 N•m)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm ²) wires maximum			
Repeatability (linear travel of cam)		0.05 mm (± 0.002 in.)	0.03 mm (± 0.001 in.)	0.05 mm (± 0.002 in.)	0.05 mm (± 0.002 in.)
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry			

(1) Lever arm type must be ordered separately from page 43 to 48.

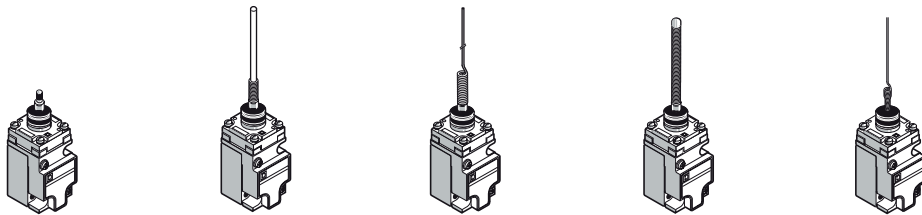
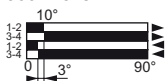
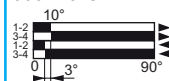
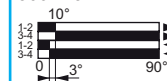
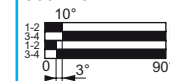
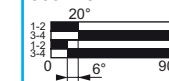
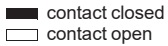
(2) These devices are factory set to operate the contacts in **both** the **CW** and **CCW** directions. **Mode of operation** is field convertible to CW only or CCW only. To **order factory converted devices**: For CCW only operation, change the **2** at the end of the Type number to **1** (for example, C54B2 becomes C54B1). For CW only operation, delete the **2** at the end of the Type number (for example C54B2 becomes C54B).



Mode of operation of the lever arm is easily convertible to clockwise or both.
Simply pull out and rotate the arrow to the letters representing the desired direction—CW, CCW, or CW/CCW.

Limit switches

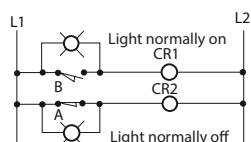
9007C Heavy Duty Industrial
Plug-in Body, Metal
Compact Body

Type of head		Flexible operator (wobble stick)				
Standard plug-in body type						
Type of operator		Universal (1)	Wobble stick Delrin® extension (1)	Wobble stick wire extension (1)	Wobble stick coil spring extension (1)	Cat whisker
Catalog numbers						
1 N.O. 1 N.C. snap action 		9007C52JKC 	9007C52J 	9007C52K 	9007C52KC 	9007C52L 
Weight, kg (lb)		0.468 (1.03)	0.568 (1.25)	0.540 (1.19)	0.568 (1.25)	0.468 (1.03)
Contact operation						
Characteristics (nominal operating data)						
Switch actuation		By any moving				
Type of actuation						
Pre-travel		10° (any direction)				20°
Pre-travel two Stage	First stage	10° (any direction)				20°
	First stage to second stage	4°				5°
Total travel		90°				
Differential		3°				6°
Reverse overtravel		—				
Operating torque/force 1 pole & 2 pole		3 lb-in (0.34 N•m)				7 oz-in (0.05 N•m)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum				
Repeatability (linear travel of cam)		—				
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry				

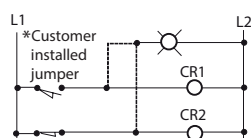
(1) **Wobble stick extensions** are available separately for the universal head. See page 42.



Rotary head shown with S9 option



Form P5 Thru P9



Form P10

* Only one of the jumpers may be used.
Pilot light is On when load is energized

Special features and modifications

Special features do not apply to 9007CR unless noted. Not field installable, except where noted.

Shaft equipped with hub for mounting larger diameter lever used with 9007T/FT limit switches

Any rotary lever arm 9007C, CF or CR switch can be furnished with an optional shaft and hub combination which will accept the lever arms normally used with 9007T and FT limit switches. To order, add S9 as suffix to the device number. For example, to order a 9007C54B2 with this modification, order as a 9007C54B2S9. For details about switches and lever arms that can be furnished with this modification, see the appropriate catalog or the Digest.

Description	Suffix to add to the device catalog number	Weight kg (lb)
Optional hub for 9007T/FT levers	S9	0.018 (0.04)

Hub only: can be field installed on rotary shaft; see accessories, page 34

Addition of LED pilot light (1)

Description	Suffix to add to the device catalog number	Weight kg (lb)
LED Pilot light, 24 to 120 V AC or DC on plug-in type switch (9007C52, C54, C62, C66, C68 or (2))	P5 (2)	0.57 (1.25)
	P6 (2)	0.57 (1.25)
	P7	0.57 (1.25)
	P8 (3)	0.57 (1.25)
	P9 (3)	0.57 (1.25)
	P10 (4)	0.57 (1.25)

(1) Bleeder circuit must be added to ensure PLC compatibility.

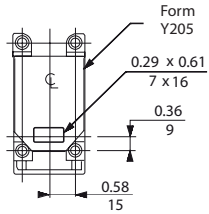
(2) 9007C84 and C86 are available with P5 or P6 pilot lights only.

(3) 9007C62, C66 or C68 only.

(4) 9007C54 only. Not available with prewired receptacles.

Examples of complete units with pilot lights in standard plug-in body type

Single pole	Catalog number	Weight kg (lb)
Side plunger	9007C54FP6	0.57 (1.25)
Top plunger	9007C54DP6	0.57 (1.25)
	9007C54EP6	0.57 (1.25)
Rotary	9007C54B2P6	0.57 (1.25)
Wobble stick	9007C54LP6	0.57 (1.25)
	9007C54JP6	0.57 (1.25)
Two poles		
Side plunger	9007C62FP6	0.57 (1.25)
Top plunger	9007C62DP6	0.57 (1.25)
	9007C62EP6	0.57 (1.25)
Rotary	9007C62B2P6	0.57 (1.25)
Wobble stick	9007C62LP6	0.57 (1.25)
	9007C62JP6	0.57 (1.25)



Y2051

Special features and modifications (continued)

Special features do not apply to 9007CR unless noted. Not field installable, except where noted.

Manifold mounting

Description	Suffix to add to the device catalog number	Weight kg (lb)
Manifold mounting available on standard and compact types. Replaces existing type B installations if new hole is drilled to match knockout. Supersedes type C with form Y205. Receptacle is furnished with a wiring hole and a gasket in the base.	Y2051	0.57 (1.25)
Special chemical resistant coating (includes Viton® fluorocarbon seals—Y140, and stainless steel head and body screws) (1)	L3	0.57 (1.25)
Low temperature – lever types only: limit switch will operate in an ambient temperature range of -40 to 185 °F (standard limit switch ambient temperature range is -20 to 185 °F). Minimum temperature is based on the absence of freezing moisture or water.	Y128	0.57 (1.25)
Viton fluorocarbon gaskets and seals (1) Substitution of Viton fluorocarbon gaskets and seals on:		
Lever arm type, standard box (Viton fluorocarbon shaft seals on lever arm types as standard)	Y140	0.57 (1.25)
Lever arm type, compact box (Viton fluorocarbon shaft seals on lever arm types as standard)	Y140	0.57 (1.25)
Plunger type, standard box	Y140	0.57 (1.25)
Plunger type, standard box	Y140	0.57 (1.25)
Substitution of Viton fluorocarbon boot only on plunger type switches	Y1401	0.57 (1.25)

(1) Fluorocarbon (as found in Viton seals) has been shown to resist sunlight aging problems.

Mini and micro connectors, ISO M20 (Form M11)

To order 9007C with ISO M 20 thread add the suffix M11 to the device number.

Examples of complete unit catalog numbers with ISO M20 thread in standard plug-in body type

Type of head	Catalog number	Weight kg (lb)
Single pole		
Side plunger	9007C54FM11	0.57 (1.25)
Top plunger	9007C54DM11	0.57 (1.25)
	9007C54EM11	0.57 (1.25)
Rotary	9007C54B2M11	0.57 (1.25)
Wobble stick	9007C54LM11	0.57 (1.25)
	9007C54JM11	0.57 (1.25)
Two poles		
Side plunger	9007C62FM11	0.57 (1.25)
Top plunger	9007C62DM11	0.57 (1.25)
	9007C62EM11	0.57 (1.25)
Rotary	9007C62B2M11	0.57 (1.25)
Wobble stick	9007C62LM11	0.57 (1.25)
	9007C62JM11	0.57 (1.25)



Standard body shown
with Y190• option

Special features and modifications

Special features do not apply to 9007CR unless noted. Not field installable, except where noted.

Pre-wired receptacle (1) (2)

Description	For use	Suffix to add to the device catalog number	Weight kg (lb)
Plug-in limit switch furnished with pre-wired mini 5-pin Brad Harrison male connector			
Single pole	For use with Brad Harrison female portable plug No.41306, 41307 or 41308 (or equal).	Y1901	0.60 (1.33)
	Same as Y1901 but with different wire color coding	Y1905	0.60 (1.33)
Tamper proof screws in complete switch only			
Single pole	Same as Y1901 but with tamper proof screws on head and body	Y1903	0.60 (1.33)
	Similar to Y1905 except for double pole device	Y19013	0.60 (1.33)

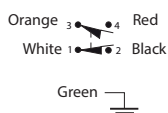
(1) Plug and cable assemblies: see accessories page 34

(2) Not available with P10 or for Hazardous location switches

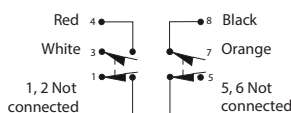
Examples of complete unit catalog numbers with mini or micro connectors in standard plug-in body type

Type of head	Catalog number	Weight kg (lb)
Single pole, 5-pin mini connector (7/8"-16 UN-2A thread)		
Side plunger	9007C54FY1901	0.57 (1.25)
Top plunger	9007C54DY1901	0.57 (1.25)
	9007C54EY1901	0.57 (1.25)
Rotary	9007C54B2Y1901	0.57 (1.25)
Wobble stick	9007C54LY1901	0.57 (1.25)
	9007C54JY1901	0.57 (1.25)
Two poles, 9-pin mini connector (1-2/8"-16 UN-2A thread)		
Side plunger	9007C62FY19016	0.57 (1.25)
Top plunger	9007C62DY19016	0.57 (1.25)
	9007C62EY19016	0.57 (1.25)
Rotary	9007C62B2Y19016	0.57 (1.25)
Wobble stick	9007C62LY19016	0.57 (1.25)
	9007C62JY19016	0.57 (1.25)
Two poles, 9-pin mini connector (1-2/8"-16 UN-2A thread)		
Side plunger	9007C62FY1912	0.57 (1.25)
Top plunger	9007C54DY1912	0.57 (1.25)
	9007C54EY1912	0.57 (1.25)
Rotary	9007C54B2Y1912	0.57 (1.25)
Wobble stick	9007C54LY1912	0.57 (1.25)
	9007C54JY1912	0.57 (1.25)
Two poles, 9-pin mini connector (1-2/8"-16 UN-2A thread)		
Side plunger	9007C54FY19019	0.57 (1.25)
Top plunger	9007C54DY19019	0.57 (1.25)
	9007C54EY19019	0.57 (1.25)
Rotary	9007C54B2Y19019	0.57 (1.25)
Wobble stick	9007C54LY19019	0.57 (1.25)
	9007C54JY19019	0.57 (1.25)

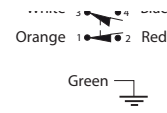
Wiring Diagrams



Form Y1901, Y1903



Form Y19013



Form Y1905



Terminal base shown with
Y18** option

Special features and modifications

Special features do not apply to 9007CR unless noted. Not field installable, except where noted.

Pre-wired receptacle (1) (2)

Description (2)		Suffix to add to the device catalog number	Weight kg (lb)
With individual wires	Single pole With five #16 wires five ft long	Y1841	0.59 (1.30)
	Two pole With nine #16 wires five ft long	Y1842	0.60 (1.33)
With STOWA cord	Single pole With five conductor #16 STOWA cord eight ft long	Y1851	1.30 (2.88)
	Single pole Same as Y1851 but with different wire color coding	Y1855	1.30 (2.88)
	Two pole With nine conductor #16 STOWA cord eight ft long	Y1852	1.31 (2.90)
	Two pole Same as Y1852 but with different wire color coding	Y1856	1.31 (2.90)

Tamper proof screws—complete switch only

With individual wires	Same as Y1841 but with tamper proof screws on head and body	Y1843	0.59 (1.30)
	Same as Y1842 but with tamper proof screws on head and body	Y1844	0.60 (1.33)
With STOWA cord	Same as Y1851 but with tamper proof screws on head and body	Y1853	1.30 (2.88)
	Same as Y1852 but with tamper proof screws on head and body	Y1854	1.30 (2.88)
	Same as Y1855 but with tamper proof screws on head and body	Y1857	1.31 (2.90)
	Same as Y1856 but with tamper proof screws on head and body	Y1858	1.31 (2.90)

(1) Not for 9007CR Hazardous location devices

(2) Wire entry completely sealed with epoxy resin.

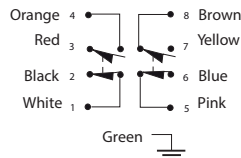
Dust boot (protects against abrasive dusts, dirt, grit and sand)

Description		Suffix to add to the device catalog number	Weight kg (lb)
Lever type limit switch furnished with a boot around the shaft	On all 9007C and 9007CR lever type switches	Y33	0.01 (0.01)
Dust boot only	See accessories, page 34		

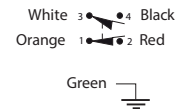
Wiring Diagrams



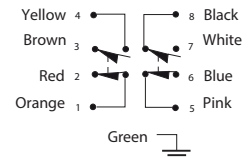
Forms Y1851 and Y1853



Forms Y1852 and Y1854



Forms Y1855 and Y1857



Forms Y1856 and Y1858

Special features and modifications

Special features do not apply to 9007 CR unless noted. Not field installable, except where noted.

Optional shafts

Description	Suffix to add to the device catalog number	Weight kg (lb)
Optional shaft, 7.8 mm (0.306 in.) diameter: To accommodate lever arms from the obsolete R.B.Denison® C limit switches. Available on all 9007C, CF, or CR limit switches	Y247	0.57 (1.25)
Optional shaft, 7.1 mm (0.28 in.) diameter: Available on all 9007C, CF, or CR limit switches	Y249	0.57 (1.25)

Switch with adapter plate

Description	Suffix to add to the device catalog number	Weight kg (lb)
Switch with adapter plate permitting substitution of any 9007C switch with standard body for any type T switch with style B base plate	Y147	—

Direct acting contacts / Positive opening contacts ☹ Y1561

One pole, normally closed, slow make-slow break, direct acting contact mechanism substituted for standard snap switch on 9007C52, C54 and CR53 devices.

This mechanism was designed for use in emergency overtravel applications. The movable contact of this basic switch unit is acted upon directly by the actuating mechanism of the limit switch and is not dependent upon the force exerted by a snap switch blade or spring to open the circuit. Because these contacts are slow make-slow break, they are best suited for applications where they are not actuated during normal operation, but only if abnormal overtravel is encountered.

Electrical contact ratings

AC — NEMA A600 maximum current — 35% power factor						DC maximum current			
Volts	Make		Break		Continuous carrying	Volts	Make or break		Continuous carrying A
	A	VA	A	VA			A	AV	
120	60	7200	6	720	10	125	1.1/0.55 (1)	138/69 (1)	5/2.5 (1)
240	30	7200	3	720	10	—	—	—	—
480	15	7200	1.5	720	10	250	0.27	67.5	2.5
600	12	7200	1.2	720	10	600	0.10	60	2.5

(1) 9007C52 compact unit ratings at 125 Vdc — same ratings as 9007C54 and 9007CR53 at other voltages.

Description	Suffix to add to the device catalog number	Weight kg (lb)
Direct acting contact/positive opening contact block (slow break single pole only)	Y1561	0.566 (1.25)

Limit switches

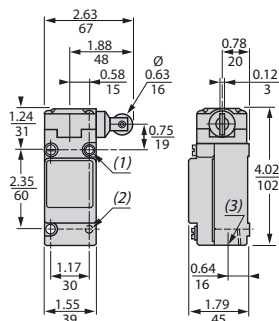
9007C Heavy Duty Industrial
Plug-in Body, Metal
Factory Modifications (Forms)

Accessories		
Hub only		
Description	Catalog number	Weight kg (lb)
Hub can be field installed on any 9007C lever type switch, increasing the shaft diameter from 0.375–0.749 in. (9.53–19 mm), to accept levers normally used with 9007T/FT switches.	9007S9	0.02 (0.04)
Dust boot only		
Description	Catalog number	Weight kg (lb)
Dust boot can be field installed on any 9007C and CR lever type switch	9007BT3	0.01 (0.01)
Conduit seal insert (field instable)		
Description	Catalog number	Weight kg (lb)
Conduit seal fits in conduit entrance and excludes liquids		
5 hole seal	31032-488-01	0.01 (0.02)
9 hole seal	31032-815-01	0.01 (0.02)
Conduit seal insert (field instable)		
Description	Catalog number	Weight kg (lb)
5-pin mini connecting cables (to fit certain switches with Form Y190--)		
Plug and 3 ft (0.91 m) cable	BH2053	—
Plug and 6 ft (1.83 m) cable	BH2056	—
Plug and 12 ft (3.66 m) cable	BH20512	—
<i>Note: For specific other cables available, please contact your local Customer Care Center.</i>		
Adapter—Field installable		
Description	Catalog number	Weight kg (lb)
Adapter plate kit only		
Plate plus mounting screws for substitution of any 9007C switch with standard box for any 9007T switch with style B base plate	9007BT1	0.23 (0.50)
Adapter plate		
for direct substitution of any 9007C plunger switches for 9007B plug-in plunger switches—use only if there is a problem in lining up cam tracks		
Standard body type	9007CT10 (1)	0.13 (0.28)
Compact body type	9007CT13 (2)	0.01 (0.20)
Adapter plate kit	9007CT11	0.23 (0.50)
permitting direct substitution of any 9007C lever arm switch with standard box for any 9007AW lever arm switch		
20 mm conduit connection adapter	9007CT12	0.01 (0.20)
male 0.5 in. (12.7 mm) NPT on one end, female 0.787 in. (20 mm) on other end		
<i>(1) Dimensions: 0.22 x 2.94 x 1.54 in. (5.6 x 75 x 39 mm)</i>		
<i>(2) Dimensions: 0.22 x 2.07 x 1.54 in. (5.6 x 53 x 39 mm)</i>		

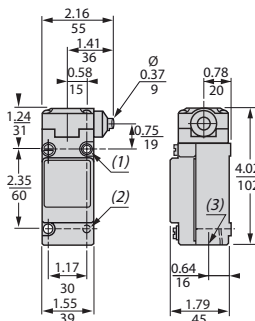
Dimensions

Side Plunger

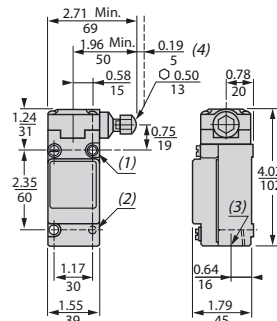
9007C--F



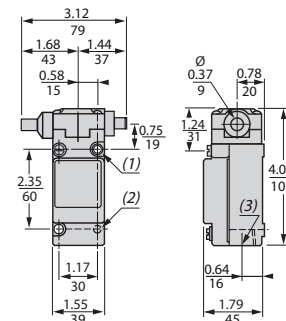
9007C--G



9007C--GD



9007C--H



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.

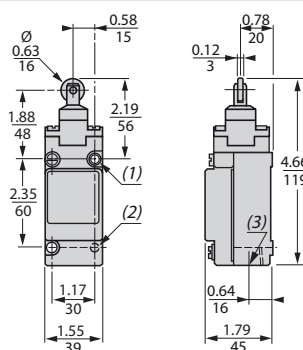
(2) 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.

(3) 1/2 14 NPT.

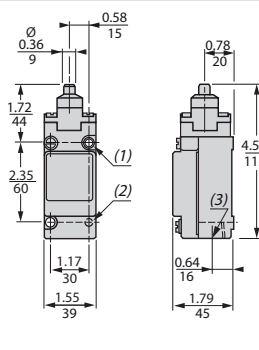
(4) Adjustable

Top Plunger

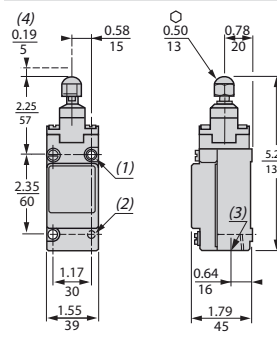
9007C--D



9007C--E



9007C--ED



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.

(2) 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.

(3) 1/2 14 NPT.

(4) Adjustable

Limit switches

9007C Heavy Duty Industrial

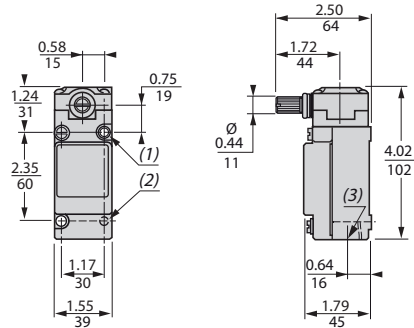
Plug-in Body, Metal

Standard Body

Dimensions

Rotary

9007C*** A, B, C, N, T5, T10



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

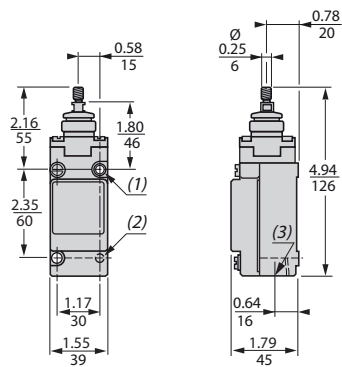
(1) 2 x 0.20/5 x 0.22/6 HLS.

(2) 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.

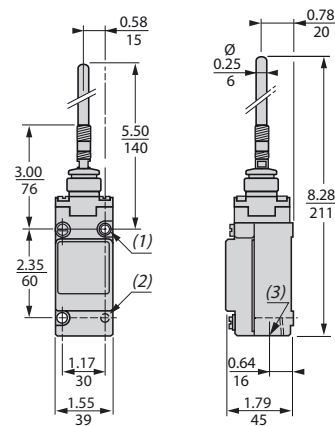
(3) 1/2 14 NPT.

Wobble stick

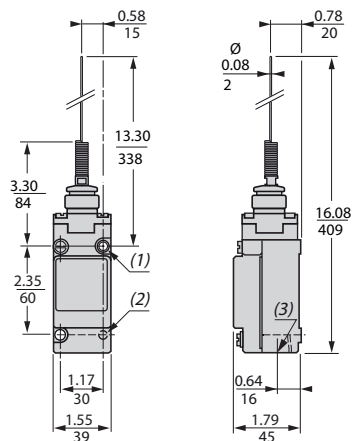
9007C**JKC



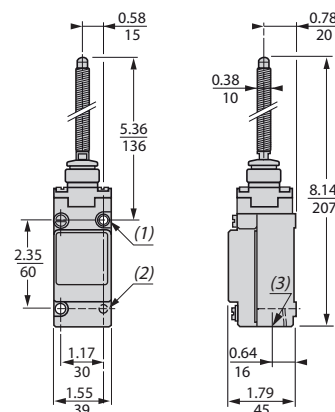
9007C**J



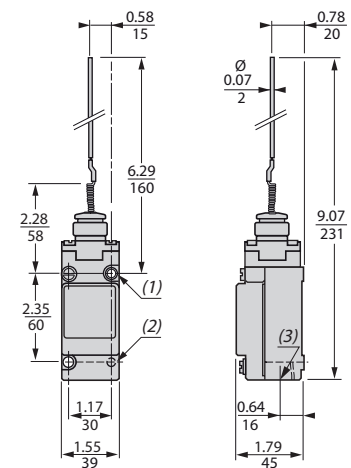
9007C**K



9007C**KC



9007C**L



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.

(2) 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.

(3) 1/2 14 NPT.

Limit switches

9007C Heavy Duty Industrial

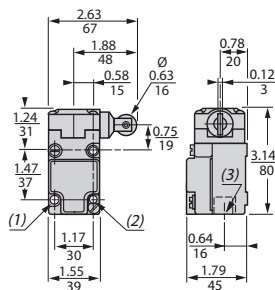
Plug-in Body, Metal

Compact Body

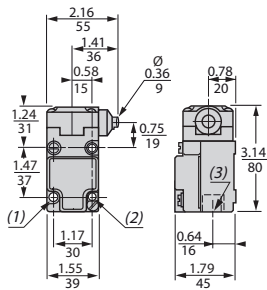
Dimensions

Side Plunger

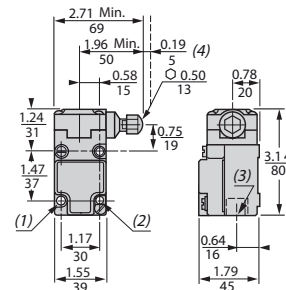
9007C52F



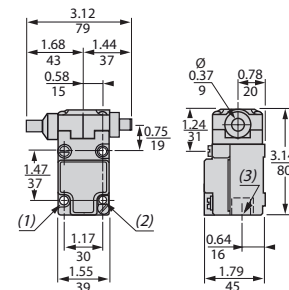
9007C52G



9007C52GD



9007C52H



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.

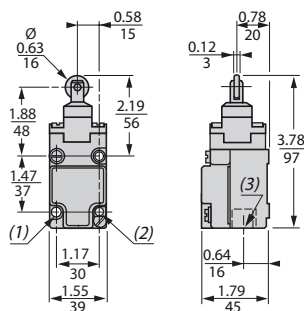
(2) 2 x 10-24 Tapped HLS Back Mtg 0.205 DP.

(3) 1/2 14 NPT.

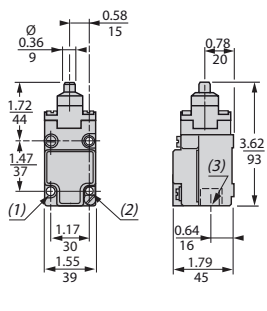
(4) Adjustable

Top Plunger

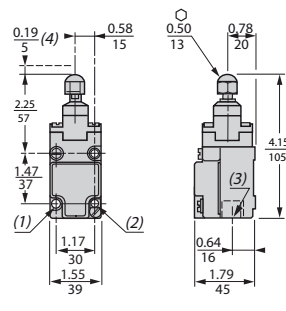
9007C52D



9007C52E



9007C52ED



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.

(2) 2 x 10-24 Tapped HLS Back Mtg 0.205 DP.

(3) 1/2 14 NPT.

(4) Adjustable

Limit switches

9007C Heavy Duty Industrial

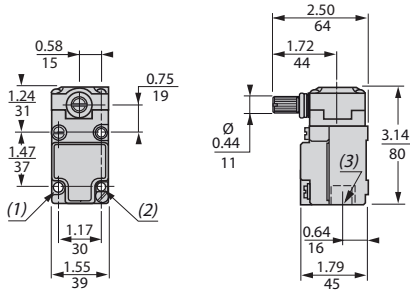
Plug-in Body, Metal

Compact Body

Dimensions

Rotary

9007C52** A, B, C, N, T5, T10



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

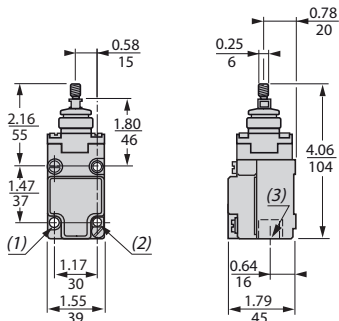
(1) 2 x 0.20/5 x 0.22/6 HLS.

(2) 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.

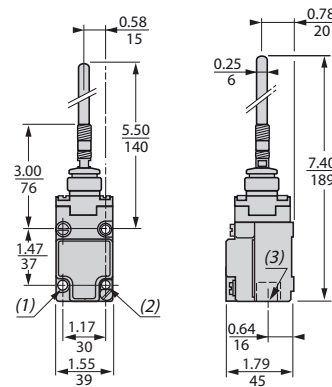
(3) 1/2 14 NPT.

Wobble stick

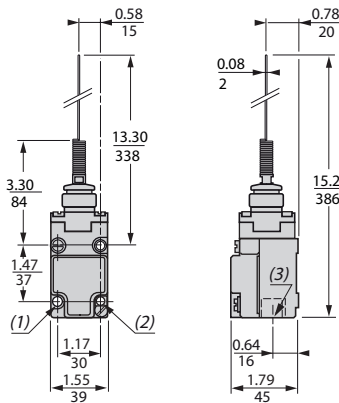
9007C52JKC



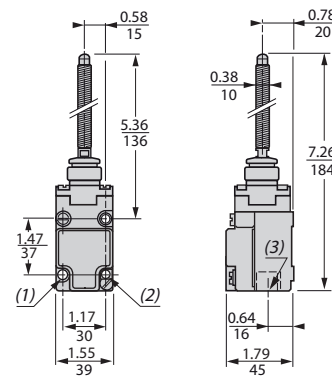
9007C52J



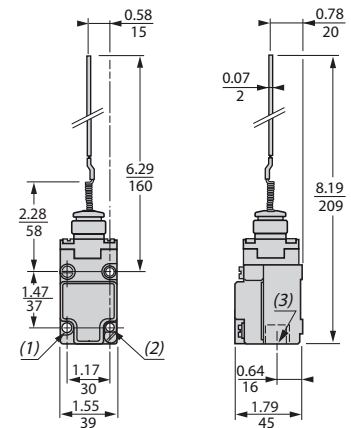
9007C52K



9007C52KC



9007C52L



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.

(2) 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.

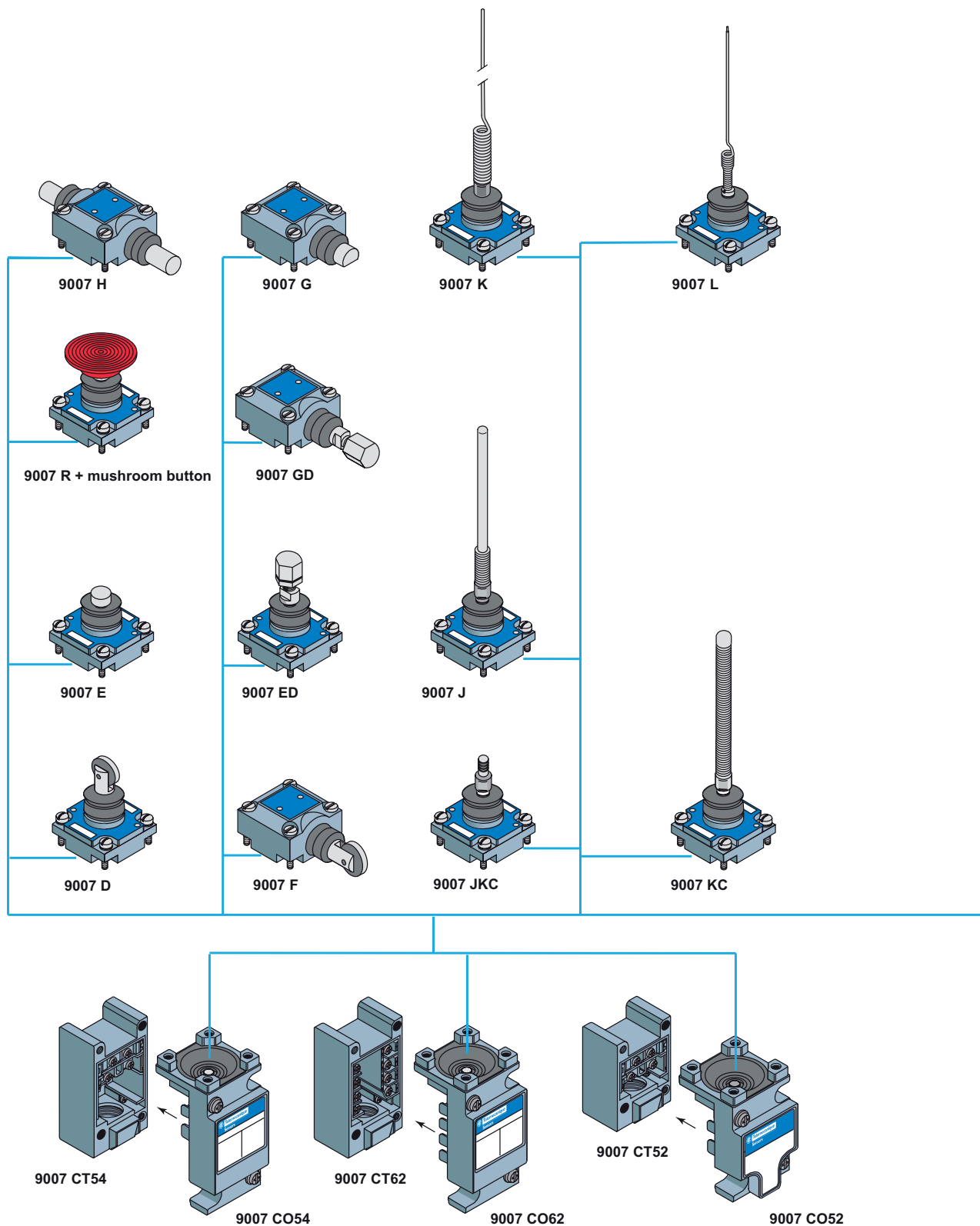
(3) 1/2 14 NPT.

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Adaptable Sub-Assemblies

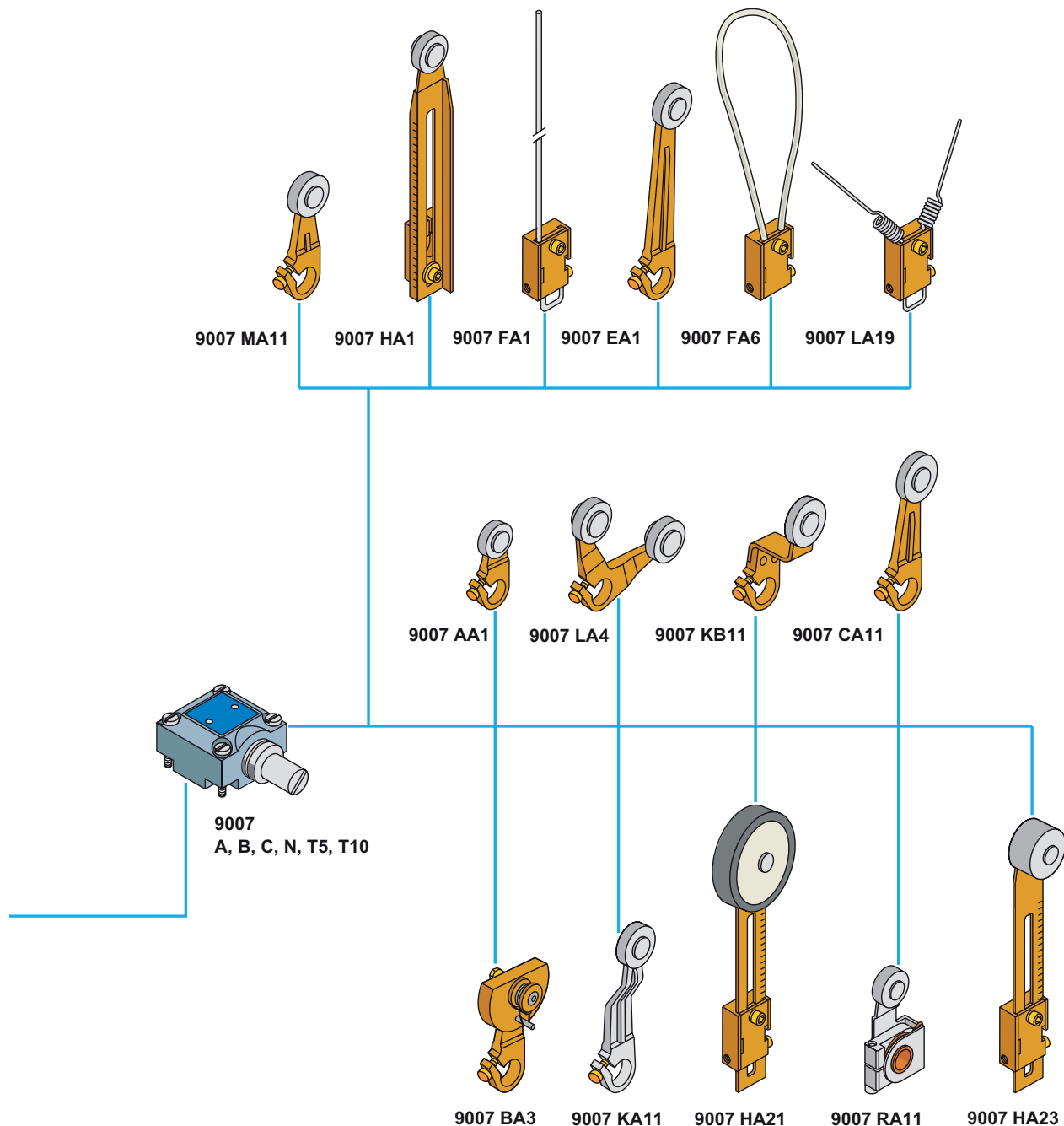


Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Adaptable Sub-Assemblies

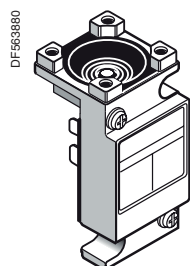


Limit switches

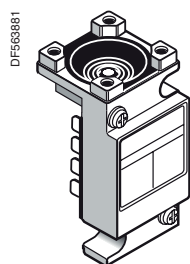
9007C Heavy Duty Industrial

Plug-in Body, Metal

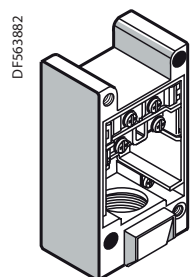
Adaptable Sub-Assemblies



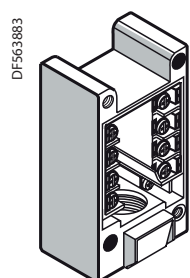
9007CO54



9007CO62



9007CT54



9007CT62

Bodies with contacts for plunger or rotary heads

Type	Type of contact	Function diagram	Catalog number	Weight kg (lb)
Plug-in Unit (Top) with contacts				
For standard plug-in body type	Single pole		9007CO54	0.19 (0.42)
	Two pole		9007CO62	0.20 (0.44)
	Two stage		9007CO66	0.23 (0.50)
	Neutral position		9007CO68	0.20 (0.45)

For compact plug-in body type	Single pole		9007CO52	0.18 (0.40)
-------------------------------	-------------	--	-----------------	-------------

Plug-in Receptacle (Base) with screw terminals (1)

For standard plug-in body type	Single pole		9007CT54	0.22 (0.48)
	Two pole		9007CT62	0.22 (0.48)
	Neutral position		9007CT62	0.22 (0.48)
	Two stage		9007CT62	0.22 (0.48)
	Reed switches, either N/O or N/C (2)		9007CT54	0.22 (0.48)
For compact plug-in body type	Single pole		9007CT52	0.15 (0.34)

(1) Acceptable wire sizes: 12-22 AWG (2.05 mm²-0.644 mm²).
Recommended terminal clamp torque: 7 lb-in (0.80 N•m).

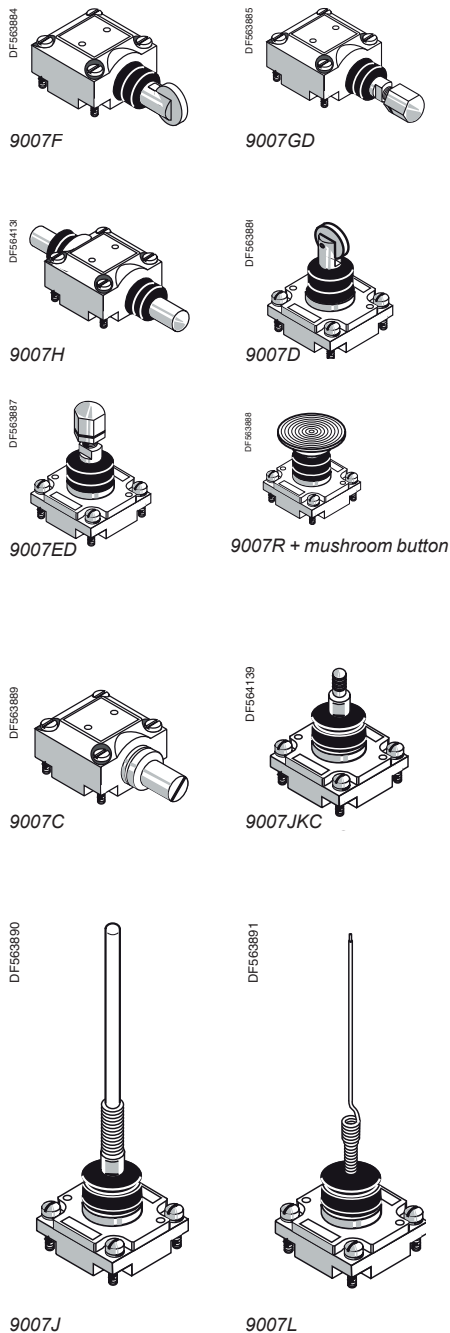
(2) Reed switches: plug-in switches less heads are not available as separate units.
Order complete plug-in unit with a head. Example: 9007C084B2.

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Adaptable Sub-Assemblies



Heads for linear, rotary and multi-directional movements

Type of operator	Diameter	Color	Catalog number	Weight kg (lb)
Side plunger heads				
Side roller plunger, spring return, vertical roller (1)			9007F	0.16 (0.36)
Side push rod plunger, spring return			9007G	0.15 (0.34)
Side push rod plunger, adjustable spring return			9007GD	0.16 (0.36)
Side push rod plunger, maintained contact			9007H	0.16 (0.36)

Top plunger heads

Top roller plunger, spring return			9007D	0.12 (0.26)
Top push rod plunger, spring return			9007E	0.11 (0.24)
Top push rod plunger, adjustable spring return			9007ED	0.12 (0.27)
Palm operated turret head without mushroom button			9007R	0.13 (0.28)
Mushroom button see Accessories (below)				

Rotary heads (without lever arm type)

Type of operator	Type of direction	Catalog number	Weight kg (lb)
Standard pre-travel spring return	CW & CCW	9007B	0.19 (0.41)
Low differential spring return	CW & CCW	9007A	0.19 (0.41)
Neutral position	CW & CCW	9007T10	0.16 (0.36)
Standard pre-travel spring return			
Neutral position	CW & CCW	9007T5	0.16 (0.36)
Low differential spring return			
Extra light operating torque spring return	CW & CCW	9007N	0.18 (0.40)
Maintained contact	CW (trip) CCW (reset)	9007C	0.19 (0.41)

Multi-directional head

Type of operator	Catalog number	Weight kg (lb)
Universal (2)	9007JKC	0.19 (0.41)
Wobble stick, Delrin® extension (2)	9007J	0.20 (0.43)
Wobble stick, wire extension (2)	9007K	0.26 (0.57)
Wobble stick, coil spring extension (2)	9007KC	0.22 (0.48)
Cat whisker	9007L	0.17 (0.37)

Accessories

Description	Diameter in. (mm)	Color	Catalog number	Weight kg (lb)
Mushroom button for palm operated turret head	1.38 (35)	Black	2358C6G3	0.03 (0.06)
		Red	2358C6G2	0.03 (0.06)
		Green	2358C6G6	0.03 (0.06)
		Yellow	2358C6G8	0.03 (0.06)
	2.25 (57.2)	Black	—	—
		Red	2358C22G3	0.05 (0.10)
		Green	2358C22G6	0.05 (0.10)
		Yellow	2358C22G8	0.05 (0.10)
Description (2)	Type of extension	Catalog number	Weight kg (lb)	
Wobble stick extensions for the universal head	Delrin® extension	9007WJ	0.01 (0.03)	
	Wire extension	9007WK	0.01 (0.02)	
	Coil spring extension	9007WKC	0.02 (0.04)	

(1) Field convertible to horizontal.

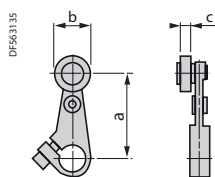
(2) Acceptable wire sizes: 12-22 AWG (2.05 mm²-0.644mm²).
Recommended terminal clamp torque: 7 lb-in (0.80 N·m)

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Lever Arms for Rotary Heads



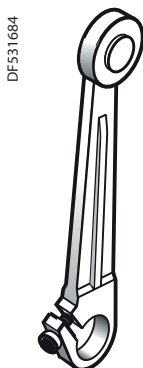
a: Length of the lever arm
b: Roller diameter
c: Roller width



9007AA1



9007MA11



9007EA1



9007CA11

Cast zinc lever arms standard roller

Arm	Steel roller			
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with steel roller (1)				
0.88 (22)	0.63 (16)	0.25 (6.3)	9007AA1	0.02 (0.05)
		0.63 (16)	9007AA2	0.03 (0.07)
1.38 (35)	0.75 (19)	0.25 (6.3)	9007BA11	0.03 (0.07)
		0.63 (16)	9007BA12	0.05 (0.10)
	0.63 (16)	0.25 (6.3)	9007BA1	0.03 (0.07)
		0.63 (16)	9007BA2	0.04 (0.08)
1.5 (38)	0.75 (19)	0.25 (6.3)	9007MA11	0.03 (0.07)
		0.63 (16)	9007MA12	0.05 (0.11)
	0.63 (16)	0.25 (6.3)	9007MA1	0.03 (0.06)
		0.63 (16)	9007MA2	0.05 (0.10)
2 (51)	0.75 (19)	0.25 (6.3)	9007CA11	0.04 (0.08)
		0.63 (16)	9007CA12	0.05 (0.12)
	0.63 (16)	0.25 (6.3)	9007CA1	0.04 (0.08)
		0.63 (16)	9007CA2	0.05 (0.10)
2.5 (63.5)	0.75 (19)	0.25 (6.3)	9007DA11	0.05 (0.10)
		0.63 (16)	9007DA12	0.06 (0.13)
	0.63 (16)	0.25 (6.3)	9007DA1	0.04 (0.08)
		0.63 (16)	9007DA1	0.05 (0.11)
3 (76)	0.75 (19)	0.25 (6.3)	9007EA11	0.05 (0.10)
		0.63 (16)	9007EA12	0.06 (0.14)
	0.63 (16)	0.25 (6.3)	9007EA1	0.04 (0.09)
		0.63 (16)	9007EA2	0.06 (0.14)
Arm	Nylon roller			
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with nylon roller				
0.88 (22)	0.63 (16)	0.25 (6.3)	9007AA8	0.02 (0.05)
		0.63 (16)	9007AA17	0.03 (0.07)
1.38 (35)	0.75 (19)	0.25 (6.3)	9007BA18	0.03 (0.07)
		0.63 (16)	9007BA8	0.05 (0.10)
	0.63 (16)	0.25 (6.3)	9007BA17	0.05 (0.11)
		0.63 (16)	9007BA4	0.03 (0.06)
1.5 (38)	0.75 (19)	0.25 (6.3)	9007MA18	0.03 (0.06)
		0.63 (16)	9007MA8	0.05 (0.10)
	0.63 (16)	0.25 (6.3)	9007MA17	0.05 (0.10)
		0.63 (16)	9007MA4	0.05 (0.10)
2 (51)	0.75 (19)	0.25 (6.3)	9007CA18	0.05 (0.10)
		0.63 (16)	9007CA8	0.03 (0.06)
	0.63 (16)	0.25 (6.3)	9007CA17	0.03 (0.07)
		0.63 (16)	9007CA4	0.05 (0.12)
2.5 (63.5)	0.75 (19)	0.25 (6.3)	9007DA18	0.03 (0.07)
		0.63 (16)	9007DA8	0.06 (0.13)
	0.63 (16)	0.25 (6.3)	9007DA17	0.06 (0.13)
		0.63 (16)	9007DA4	0.06 (0.14)
3 (76)	0.75 (19)	0.25 (6.3)	9007EA18	0.04 (0.08)
		0.63 (16)	9007EA8	0.06 (0.14)
	0.63 (16)	0.25 (6.3)	9007EA17	0.07 (0.16)
		0.63 (16)	9007EA4	0.07 (0.15)
		0.63 (16)	9007EA13	0.08 (0.17)

(1) Material is hardened, oil-impregnated, sintered iron.

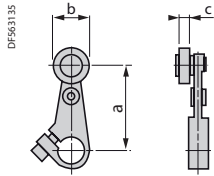
Dimensions:
page 49 to 50

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Lever Arms for Rotary Heads



a: Length of the lever arm
b: Roller diameter
c: Roller width

Cast zinc lever arms (continued)

Arm		Ball bearing roller		
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with ball bearing roller				
0.88 (22)	0.69 (17.5)	0.25 (6.3)	9007AA9	0.04 (0.09)
1.38 (35)	0.69 (17.5)	0.25 (6.3)	9007BA9	0.04 (0.09)
1.5 (38)	0.69 (17.5)	0.25 (6.3)	9007MA9	0.04 (0.09)
2 (51)	0.69 (17.5)	0.25 (6.3)	9007CA9	0.04 (0.09)
2.5 (63.5)	0.69 (17.5)	0.25 (6.3)	9007DA9	0.04 (0.09)
3 (76)	0.69 (17.5)	0.25 (6.3)	9007EA9	0.04 (0.09)

Lever arm		Roller on opposite side to standard		
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with roller on opposite side to standard				
0.88 (22)	0.63 (16)	0.25 (6.3)	9007AA5	0.04 (0.09)
		0.63 (16)	9007AA6	0.04 (0.09)
1.38 (35)	0.75 (19)	0.25 (6.3)	9007BA15	0.04 (0.09)
		0.25 (6.3)	9007BA5	0.04 (0.09)
		0.63 (16)	9007BA6	0.04 (0.09)
1.5 (38)	0.75 (19)	0.25 (6.3)	9007MA15	0.04 (0.09)
		0.25 (6.3)	9007MA5	0.04 (0.09)
		0.63 (16)	9007MA6	0.04 (0.09)
2 (51)	0.75 (19)	0.25 (6.3)	9007CA15	0.04 (0.09)
		0.25 (6.3)	9007CA5	0.04 (0.09)
		0.63 (16)	9007CA6	0.04 (0.09)
2.5 (63.5)	0.75 (19)	0.25 (6.3)	9007DA15	0.04 (0.09)
		0.25 (6.3)	9007DA5	0.04 (0.09)
		0.63 (16)	9007DA6	0.04 (0.09)
3 (76)	0.75 (19)	0.25 (6.3)	9007EA15	0.04 (0.09)
		0.25 (6.3)	9007EA5	0.04 (0.09)
		0.63 (16)	9007EA6	0.04 (0.09)

Arm		Ball bearing roller		
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with roller countersunk roller pin				
1.5 (38)	0.75 (19)	0.25 (6.3)	9007MA31	0.03 (0.07)
2 (51)	0.75 (19)	0.25 (6.3)	9007CA31	0.04 (0.08)
2.5 (63.5)	0.75 (19)	0.25 (6.3)	9007DA31	0.04 (0.09)

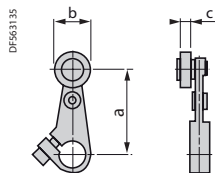
Arm		Cable		
Length in. (mm)	Length in. (mm)		Catalog number	Weight kg (lb)
Lever arms with cable operated with eyebolt (I.D.) instead of roller				
1.5 (38)	0.38 (9.6)		9007MA22	0.05 (0.10)

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Lever Arms for Rotary Heads



a: Length of the lever arm
b: Roller diameter
c: Roller width

Flat steel lever arms with standard roller (1)

Arm	Roller			
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with steel roller				
0.88 (22)	0.63 (16)	0.25 (6.3)	9007AA1S	0.01 (0.03)
		0.63 (16)	9007AA2S	0.01 (0.03)
1.38 (35)	0.63 (16)	0.25 (6.3)	9007BA1S	0.01 (0.03)
		0.63 (16)	9007BA2S	0.01 (0.03)
2 (51))	0.63 (16)	0.25 (6.3)	9007CA1S	0.03 (0.07)
		0.63 (16)	9007CA2S	0.04 (0.08)
2.5 (63.5)	0.63 (16)	0.25 (6.3)	9007DA1S	0.04 (0.08)
		0.63 (16)	9007DA2S	0.04 (0.08)
3 (76)	0.63 (16)	0.25 (6.3)	9007EA1S	0.04 (0.08)
		0.63 (16)	9007EA2S	0.04 (0.08)
Lever arms with nylon roller				
1.38 (35)	1 (25.4)	0.25 (6.3)	9007BA4S	0.01 (0.03)
1.5 (38)	0.75 (19)	0.25 (6.3)	9007MA18S	0.01 (0.03)
2 (51))	1 (25.4)	0.25 (6.3)	9007CA4S	0.03 (0.07)
2.5 (63.5)	1 (25.4)	0.25 (6.3)	9007DA4S	0.04 (0.08)
3 (76)	1 (25.4)	0.25 (6.3)	9007EA4S	0.04 (0.08)
Lever arms without roller				
0.88 (22)	—	—	9007AA0S	
1.38 (35)	—	—	9007BA0S	0.01 (0.02)
2 (51))	—	—	9007CA0S	0.03 (0.06)
2.5 (63.5)	—	—	9007DA0S	0.03 (0.07)
3 (76)			9007EA0S	0.03 (0.07)

(1) Material is hardened, oil-impregnated, sintered iron.

90° Forked cast zinc lever arms

Arm	Roller				
Length (a) in. (mm)	Roller position	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with steel roller					
1.5 (38)	Rollers on same side	0.75 (19)	0.25 (6.3)	9007LA4	0.05 (0.12)
		0.63 (16)	0.25 (6.3)	9007LA1	0.07 (0.15)
	R.H. Roller on opposite side	0.75 (19)	0.25 (6.3)	9007LA5	0.05 (0.12)
		0.63 (16)	0.25 (6.3)	9007LA2	0.07 (0.15)
	L.H. Roller on opposite side	0.75 (19)	0.25 (6.3)	9007LA6	0.05 (0.12)
		0.63 (16)	0.25 (6.3)	9007LA3	0.07 (0.15)
Lever arms with nylon rollers					
1.5 (38)	Rollers on same side	0.75 (19)	0.25 (6.3)	9007LA16	0.04 (0.09)
			1 (25.4)	9007LA10	0.06 (0.14)
	R.H. Roller on opposite side	0.75 (19)	0.25 (6.3)	9007LA17	0.04 (0.09)
		1 (25.4)	9007LA11	0.06 (0.14)	
	L.H. Roller on opposite side	0.75 (19)	0.25 (6.3)	9007LA18	0.04 (0.09)
		1 (25.4)	9007LA12	0.06 (0.14)	
Lever arms with ball bearing rollers					
1.5 (38)	Rollers on same side	0.69 (17.5)	0.25 (6.3)	9007LA7	0.11 (0.25)
	R.H. Roller on opposite side	0.69 (17.5)	0.25 (6.3)	9007LA8	0.11 (0.25)
	L.H. Roller on opposite side	0.69 (17.5)	0.25 (6.3)	9007LA9	0.11 (0.25)



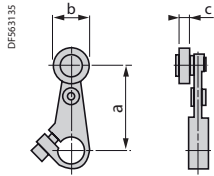
9007LA4

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Lever Arms for Rotary Heads



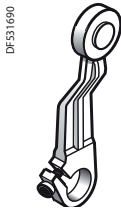
a: Length of the lever arm
b: Roller diameter
c: Roller width



9007RA11



9007BA3



9007KA11



9007KB11

One-way lever arm

Arm	Steel roller			
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arm with standard roller				
1.5 (38)	0.75 (19)	0.25 (6.3)	9007RA11	0.05 (0.12)
Lever arm with nylon roller				
1.5 (38)	0.75 (19)	0.25 (6.3)	9007RA18	0.05 (0.12)
Lever arm with ball bearing roller				
1.5 (38)	0.69 (17.5)	0.25 (6.3)	9007RA9	0.05 (0.12)
Lever arm with rod type				
5 (127)	—	—	9007FA2	0.05 (0.12)

One-way cast zinc roller lever arm

Lever arm	Roller			
Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Cast arm with steel roller				
1.38 (35)	1.25 (32)	0.25 (6.3)	9007BA3	0.07 (0.15)
1.5 (38)	1.25 (32)	0.25 (6.3)	9007MA3	0.10 (0.23)
2 (51)	1.25 (32)	0.25 (6.3)	9007CA3	0.12 (0.27)
2.5 (63.5)	1.25 (32)	0.25 (6.3)	9007DA3	0.12 (0.27)
3 (76)	1.25 (32)	0.25 (6.3)	9007EA3	0.13 (0.29)
Flat steel arm with steel roller				
1.38 (35)	1.25 (32)	0.25 (6.3)	9007BA3S	0.07 (0.15)
2 (51)	1.25 (32)	0.25 (6.3)	9007CA3S	0.10 (0.23)
2.5 (63.5)	1.25 (32)	0.25 (6.3)	9007DA3S	0.12 (0.27)
3 (76)	1.25 (32)	0.25 (6.3)	9007EA3S	0.13 (0.29)

Offset type cast zinc lever arm

Offset lever arm		Roller			
Length <i>(a)</i> in. (mm)	Offset	Diameter <i>(b)</i> in. (mm)	Width <i>(c)</i> in. (mm)	Catalog number	Weight kg (lb)
Offset cast zinc arm with steel roller					
2 (51)	0.44 (11)	0.63 (16)	0.25 (6.3)	9007KA1	0.04 (0.08)
			0.63 (16)	9007KA2	0.04 (0.08)
		0.75 (19)	0.25 (6.3)	9007KA11	0.04 (0.09)
			0.63 (16)	9007KA12	0.05 (0.12)
1.5 (38)	0.88 (22)	0.75 (19)	0.25 (6.3)	9007KB11	0.04 (0.10)
			0.25 (6.3)	9007KB15	0.04 (0.10)

Offset cast zinc arm with ball bearing roller

2 (51)	0.44 (11)	0.69 (17.5)	0.25 (6.3)	9007KA9	0.04 (0.10)
--------	-----------	-------------	------------	----------------	-------------

Offset cast zinc arm with nylon roller

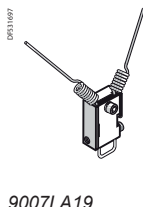
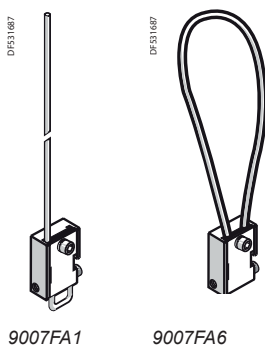
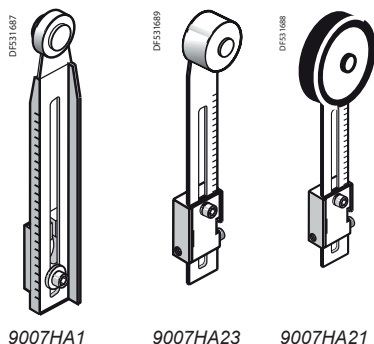
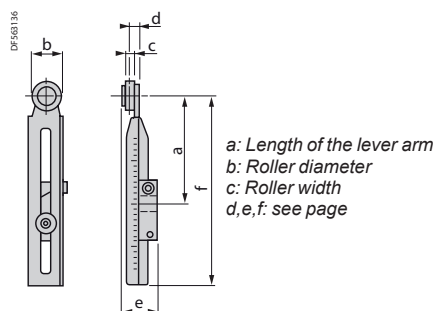
2 (51)	0.44 (11)	0.75 (19)	0.25 (6.3)	9007KA18	0.04 (0.10)
			1 (25.4)	9007KA21	0.04 (0.10)

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Lever Arms for Rotary Heads



Adjustable length lever arm

Lever Arm	Roller			
Dimension Length (a) in. (mm)	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Adjustable length arm with steel roller				
Non-bendable, adjustable from 0.88 (22) to 4 (101)	0.63 (16)	0.25 (6.3)	9007HA1	0.05 (0.12)
		0.63 (16)	9007HA2	0.07 (0.14)
Bendable, adjustable from 0.88 (22) to 4 (101)	0.63 (16)	0.25 (6.3)	9007HA5	0.06 (0.14)
		0.63 (16)	9007HA6	0.08 (0.18)

Adjustable length arm with nylon roller

Non-bendable, adjustable from 0.88 (22) to 4 (101)	0.63 (16) 1 (25.4)	0.25 (6.3)	9007HA4	0.05 (0.12)
		0.63 (16)	9007HA22	0.06 (0.13)
Bendable, adjustable from 0.88 (22) to 4 (101)	0.63 (16) 1.0 (16) 2 (51)	0.25 (6.3)	9007HA8	0.06 (0.14)
		0.63 (16)	9007HA23	0.07 (0.16)
		0.25 (6.3)	9007HA26	0.08 (0.17)

Adjustable length arm with ball bearing roller

Non-bendable, adjustable from 0.88 (22) to 4 (101)	0.69 (17.5)	0.25 (6.3)	9007HA24	0.06 (0.13)
Bendable, adjustable from 0.88 (22) to 4 (101)	0.69 (17.5)	0.25 (6.3)	9007HA25	0.07 (0.16)

Adjustable length arm with ball Delrin® roller

Bendable, adjustable from 0.88 (22) to 4 (101)	1.63 (41)	0.25 (6.3)	9007HA20	0.07 (0.16)
---	-----------	------------	-----------------	-------------

Adjustable length arm with rubber tire roller

Bendable, adjustable from 0.88 (22) to 4 (101)	2.13 (54)	0.5 (12.7)	9007HA21	0.10 (0.22)
---	-----------	------------	-----------------	-------------

Adjustable length arm with ball bearing roller

Non-bendable, adjustable from 0.88 (22) to 4 (101)	—	—	9007HA0	0.15 (0.33)
Bendable, adjustable from 0.88 (22) to 4 (101)	—	—	9007HA9	0.11 (0.25)

Rod type lever arm

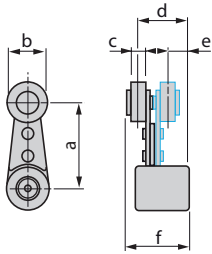
Description	Length in. (mm)	Catalog number	Weight kg (lb)
Rod			
Stainless steel rod	10 (254)	9007FA1	0.07 (0.15)
Spring rod, steel	12 (304)	9007FA3	0.07 (0.15)
Spring rod, Delrin®	12 (304)	9007FA5	0.07 (0.15)
Looped Delrin rod arm	—	9007FA6	0.05 (0.11)
90° forked rod			
Spring rods, steel	2.5 (63.5)	9007LA19	0.06 (0.13)

Limit switches

9007C Heavy Duty Industrial

Plug-in Body, Metal

Lever Arms for Rotary Heads



a: Length of the lever arm
b: Roller diameter
c: Roller width
d, e: see page

360° angular adjustable lever arm

360° angular adjustable lever arm		Roller			
Length (a) in. (mm)	Roller (1) position	Diameter (b) in. (mm)	Width (c) in. (mm)	Catalog number	Weight kg (lb)
Lever arms with steel roller					
0.88 (22)	Roller outside	0.63 (16)	0.25 (6.3)	9007AA1M	0.09 (0.20)
	Roller inside	0.63 (16)	0.25 (6.3)	9007AA5M	0.09 (0.20)
	Roller outside	0.75 (19)	0.25 (6.3)	9007AA11M	0.09 (0.20)
1.38 (35)	Roller outside	0.63 (16)	0.25 (6.3)	9007BA1M	0.09 (0.22)
	Roller inside	0.63 (16)	0.25 (6.3)	9007BA5M	0.10 (0.22)
	Roller outside	0.75 (19)	0.25 (6.3)	9007BA11M	0.10 (0.22)
1.5 (38)	Roller outside	0.63 (16)	0.25 (6.3)	9007MA1M	0.11 (0.24)
	Roller inside	0.63 (16)	0.25 (6.3)	9007MA5M	0.11 (0.24)
	Roller outside	0.75 (19)	0.25 (6.3)	9007MA11M	0.11 (0.24)
2 (51)	Roller outside	0.63 (16)	0.25 (6.3)	9007CA1M	0.11 (0.24)
	Roller inside	0.63 (16)	0.25 (6.3)	9007CA5M	0.11 (0.24)
	Roller outside	0.75 (19)	0.25 (6.3)	9007CA11M	0.11 (0.25)
2.5 (63.5)	Roller outside	0.63 (16)	0.25 (6.3)	9007DA1M	0.11 (0.25)
	Roller inside	0.63 (16)	0.25 (6.3)	9007DA5M	0.12 (0.27)
	Roller outside	0.75 (19)	0.25 (6.3)	9007DA11M	0.12 (0.27)
3 (76)	Roller outside	0.63 (16)	0.25 (6.3)	9007EA1M	0.12 (0.27)
	Roller inside	0.63 (16)	0.25 (6.3)	9007EA5M	0.12 (0.27)
	Roller outside	0.75 (19)	0.25 (6.3)	9007EA11M	0.13 (0.29)
Lever arm with nylon roller					
0.88 (22)	Roller outside	0.63 (16)	0.25 (6.3)	9007AA8M	0.09 (0.20)
		0.75 (19)	0.25 (6.3)	9007AA18M	0.09 (0.20)
1.38 (35)	Roller outside	0.63 (16)	0.25 (6.3)	9007BA8M	0.11 (0.25)
		0.75 (19)	0.25 (6.3)	9007BA18M	0.11 (0.25)
1.5 (38)	Roller outside	0.63 (16)	0.25 (6.3)	9007MA8M	0.10 (0.23)
		0.75 (19)	0.25 (6.3)	9007MA18M	0.11 (0.25)
2 (51)	Roller outside	0.63 (16)	0.25 (6.3)	9007CA8M	0.12 (0.27)
		0.75 (19)	0.25 (6.3)	9007CA18M	0.12 (0.27)
2.5 (63.5)	Roller outside	0.63 (16)	0.25 (6.3)	9007DA8M	0.12 (0.27)
		0.75 (19)	0.25 (6.3)	9007DA18M	0.12 (0.27)
3 (76)	Roller outside	0.63 (16)	0.25 (6.3)	9007EA8M	0.12 (0.26)
		0.75 (19)	0.25 (6.3)	9007EA18M	0.12 (0.27)
Lever arm with ball bearing roller					
0.88 (22)	Roller outside	0.69 (17.5)	0.25 (6.3)	9007AA9M	0.10 (0.23)
1.38 (35)	Roller outside	0.69 (17.5)	0.25 (6.3)	9007BA9M	0.11 (0.24)
1.5 (38)	Roller outside	0.69 (17.5)	0.25 (6.3)	9007MA9M	0.19 (0.26)
2 (51)	Roller outside	0.69 (17.5)	0.25 (6.3)	9007CA9M	0.19 (0.26)
2.5 (63.5)	Roller outside	0.69 (17.5)	0.25 (6.3)	9007DA9M	0.12 (0.27)
3 (76)	Roller outside	0.69 (17.5)	0.25 (6.3)	9007EA9M	0.13 (0.28)

(1) Roller can be changed in the field from roller outside to roller inside position or vice versa.

Limit switches

9007C Heavy Duty Industrial

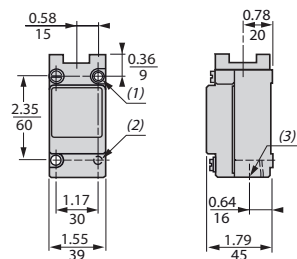
Plug-in Body, Metal

Bodies and Heads

Dimensions

Body

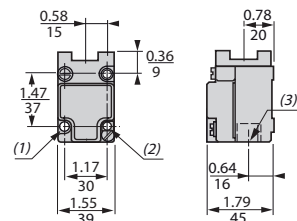
Standard



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

(1) 2 x 0.20/5 x 0.22/6 HLS.
 (2) 2 x 10-24 Tapped HLS Back Mtg
 0.29/7 DP.
 (3) 1/2 14 NPT.

Compact

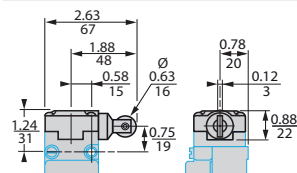


Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

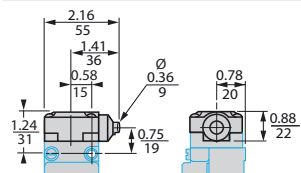
(1) 2 x 0.20/5 HLS.
 (2) 2 x 10-24 Tapped HLS Back Mtg
 0.20/5 DP.
 (3) 1/2 14 NPT.

Side plunger heads

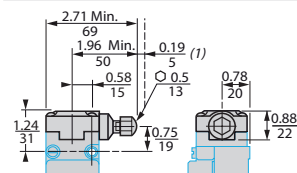
9007F



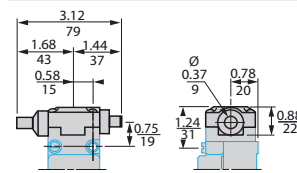
9007G



9007GD

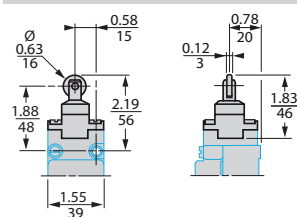


9007H

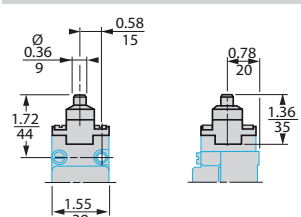


Side plunger heads

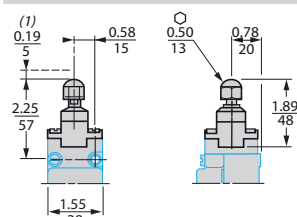
9007D



9007E



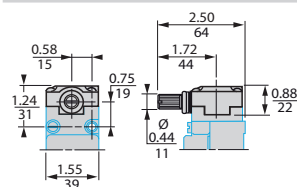
9007ED



(1) Adjustable

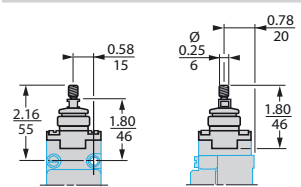
Rotary heads

9007C

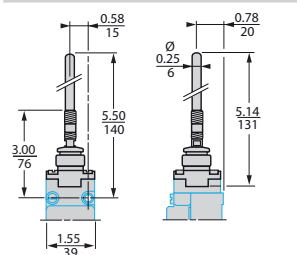


Multi-directional heads

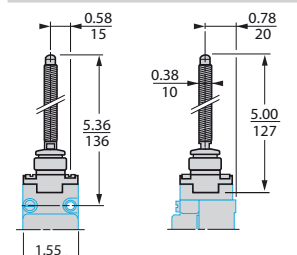
9007JKC



9007J

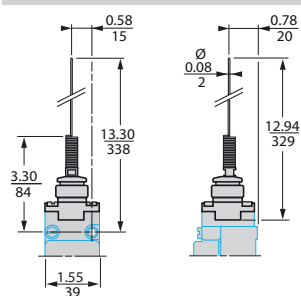


9007KC

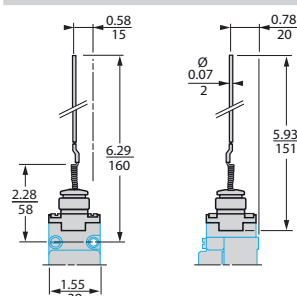


Multi-directional heads (continued)

9007K



9007L



Limit switches

9007C Heavy Duty Industrial

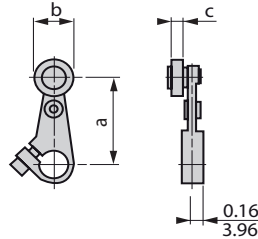
Plug-in Body, Metal

Lever Arms for Rotary Heads

Dimensions

Lever arms

9007AA**, BA**, CA**, DA**, EA**, FA**, KA**, LA**, MA**, RA**

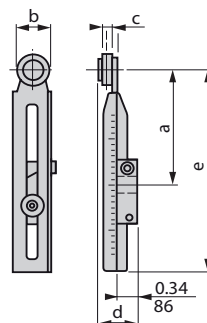


a: Length of lever arm
b: Roller diameter
c: Roller width

a, b, c: page 43 to 46

Adjustable length lever arms

9007HA• and 9007HA**

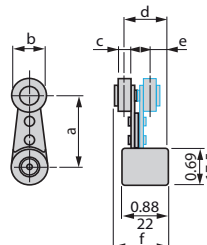


a: Length of lever arm
b: Roller diameter
c: Roller width
d = 0.38/10
e = 4.38/111

a, b, c: page 47

360° angular adjustable lever arms

9007AA**M, 9007BA**M, 9007CA**M, 9007DA**M, 9007EA**M, 9007MA**M

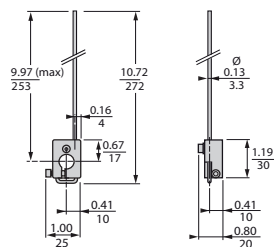


a: Length of lever arm
b: Roller diameter
c: Roller width
d = 0.84/21
e = 0.38/10
f = 1.05/27

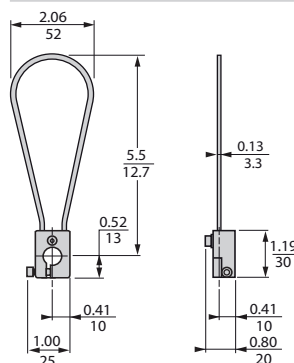
a, b, c: page 48

Rod type lever arms

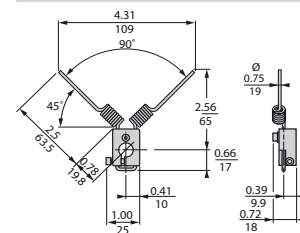
9007FA1



9007FA6



9007LA19



Limit switches

9007 Heavy Duty Industrial

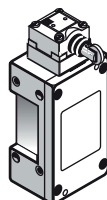
Non-Plug-in Body, Metal

Hazardous Location

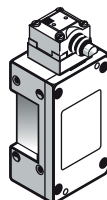
Hazardous Non-Plug-in Body Type (1)

With head for linear movement

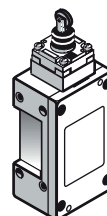
Side plunger



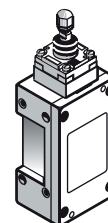
Page 53



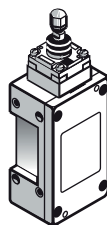
Top plunger



Page 54

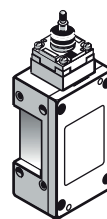


With head for rotary movement (lever)

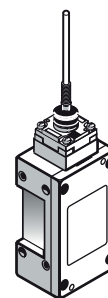


Page 55

With head for multi-directional movement



Page 56



(1) For any factory modifications requirements, please refer to your local Customer Care Center.

Application Information — Hazardous Locations

Classification of hazardous locations

Hazardous locations are those areas that **may** have flammable gases or combustible dusts present in quantities sufficient to produce an explosive or ignitable mixture. These gases, dusts, may always be present or may only be present in abnormal situations. The National Electrical Code (NEC) describes these areas in Articles 500 through 503 and divides them into three types of categories: Class, Group, Division.

■ Classes

The Classes (I, II, III) differentiate between the type of hazardous materials: I is for gases, II is for dusts, and III is for fibers.

■ Groups

The Groups (A, B, C, D, E, F, and G) further subdivide each class according to the relative explosive force of the materials. Group A atmosphere is acetylene which has a higher explosive force than Group B (which may contain hydrogen, for example); and Group B has a higher explosive force than Group D, etc.

■ Divisions

The Divisions (1 and 2) refer to the presence of these hazardous gases and dusts. Division 1 areas can have these gases or dusts present **at all times** under **normal operating conditions** in an ignitable concentration. Division 2 areas **only** have **ignitable concentrations** of dusts or gases present during **abnormal conditions**, such as machine failures or container breakage.

The table below summarizes the classifications described above.

Summary of Classification Chart

Class	Division	Group
I. Gas	1. Hazard May Exist May Exist In Atmosphere Under Normal Operating Conditions	A. Acetylene
		B. Manufactured Gases Containing Hydrogen
	2. Potential Hazard A. May be present in atmosphere only under abnormal circumstances.	C. Petrochemicals (e.g. ethylene)
		D. Petrochemicals (e.g. alcohol)
II. Dust	1. Hazard May Exist May Exist In Atmosphere Under Normal Operating Conditions	A. Acetylene
		B. Manufactured Gases Containing Hydrogen
		C. Petrochemicals (e.g. ethylene)
	2. Potential Hazard A. May be present in atmosphere only under abnormal circumstances.	D. Petrochemicals (e.g. alcohol)
		E. Conductive and Combustible Dust (Resistivity $\leq 10^5$ ohms/cm)
III. Fibers	1. Production Areas	F. Carbonaceous Dusts (Resistivity $>10^2$ ohm/cm but < 108 ohm/cm)
		G. Non-Conductive Combustible Dust (Resistivity ≥ 105 ohms/cm)
	2. Handling and Storage Areas	G. Non-Conductive Combustible Dust (Resistivity ≥ 105 ohms/cm)

Limit switches

9007C Heavy Duty Industrial

Non-Plug-in Body, Metal

Hazardous Location

Environmental characteristics

Product certifications		CE, cURus
Conformity to standards	Products	NEMA 250, EN 60947-1, EN 60947-5-1, IEC 60947, UL 508, C22-2-14-95, CE conformity documentation
	Machine assemblies	IEC 60204-1
Product certifications		UL, CSA, CE
Protective treatment		Epoxy powder coat
Ambient air temperature (Lever/rotary head)	Operation	-20...+185 °F (-29...+85 °C), wider range available
	Storage	-20...+185 °F (-29...+85 °C), wider range available
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...150 Hz, 11 ms) (C86F switch good for 18.5g only)
Shock resistance	Conforming to IEC 60068-2-27	60 gn (9 ms)
		40 gn (9 ms) for reed switch
Electric shock protection	Conforming to IEC 61140	Class 0
Degree of protection	Conforming to IEC 60529	IP 67
Cable entry or connector	Depending on model	1/2-14 NPT, M20 X 1.5, ISO cable entry, 5-pin mini connector, 4-pin micro connector
Materials	Bodies, heads, levers	Bodies in aluminum, heads in Zamak® zinc alloy, levers and rods in zinc, steel, stainless steel, Delrin® resin.

Contact block characteristics

Rated operational characteristics hard contacts -AC Voltage	9007CR53 (single pole)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CR61 (two pole)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CR65 (two pole two stage)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
	9007CR67 (two pole neutral)	NEMAA600 (Ue = 600 V, Ie = 1.2 A); Ithe = 10 A
Rated operational characteristics hard contacts -DC Voltage	9007CR53 (single pole)	NEMA Q600 (Ue = 600 V, Ie = 0.1 A); Ithe = 2.5 A
	9007CR61 (two pole)	NEMA R300 (Ue = 250 V, Ie = 0.11 A); Ithe = 1.0 A
	9007CR65 (two pole two stage)	NEMA R300 (Ue = 250 V, Ie = 0.11 A); Ithe = 1.0 A
	9007CR67 (two pole neutral)	NEMA R300 (Ue = 250 V, Ie = 0.11 A); Ithe = 1.0 A
Rated insulation voltage		600 V
Rated impulse withstand voltage		2,500 Vac for 1 minute for CE; 2,200 Vac for 1 minute for UL; and 2,640 Vac for 1 s for CSA
Positive Opening	Special Y1561	Special Y1561 (one pole slow break only) →
Short-circuit protection.		10 A Bussmann Class CC KTK-R-10 fuse non-time-delay
Terminal wire sizes (Cabling/ Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum
Maximum Actuation Speed		50 fpm / 90 fpm (15.2 m/min / 27.4 m/min) with 45 degree cam angle, levers only
Electrical durability		1 million operating cycles

Types of contact elements

IEC 60947-5-1			NEMA			JIS		
Form	Symbol	Description	Form	Symbol	Description	Form	Symbol	Description
A		Single break	A			3		Double break
X								
B		Single break	B		—	2		Double break
Y								
C		—	C		—	1		Single break
Za		Same polarity	Z		"Same polarity" only			Double break
Zb		Electrically separate						

Limit switches

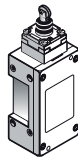
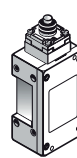
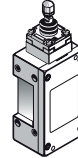
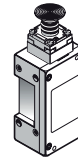
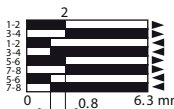
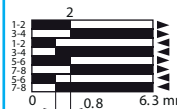
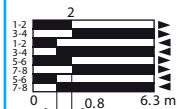
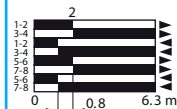
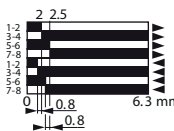
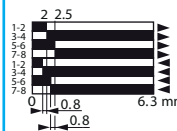
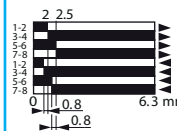
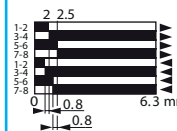
9007 Heavy Duty Industrial Non-Plug-in Body, Metal Hazardous Location

Type of head		Side plunger (mounting by the body)			
Hazardous location non-plug in body type					
Type of operator		Side roller plunger spring return vertical roller (1)	Side push rod plunger spring return	Side push rod plunger adjustable (2) spring return	Side push rod plunger maintained contact
Catalog numbers					
1 N.O. 1 N.C. snap action		 9007CR53F	 9007CR53G	 9007CR53GD	 9007CR53H
2 N.O. 2 N.C. snap action		 9007CR61F	 9007CR61G	 9007CR61GD	 9007CR61H
2 N.O. 2 N.C. Two stage snap action		 9007CR65F	 9007CR65G	 9007CR65GD	
Weight, kg (lb)		1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)
Contact operation		contact closed contact open			
Characteristics (nominal operating data)					
Switch actuation		On end			
Type of actuation					
Pre-travel		2 mm (0.08 in.)			3.6 mm (0.14 in.)
Pre-travel two Stage	First stage	2 mm (0.08 in.)			
	First stage to second stage	0.5 mm (0.02 in.)			
Total travel		6.3 mm (0.25 in.)			
Differential		0.8 mm (0.03 in.)			
Reverse overtravel		—			
Minimum force or torque 1 pole & 2 pole		4 lb (17.8 N)			7 lb (31.1 N)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm ²) wires maximum			
Repeatability (linear travel of cam)		0.03 mm (0.001 in.)			—
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry			

(1) Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter H at the end of the equivalent vertical roller version type.
 (2) To lock the nut in the desired position, crimp the slot near the bottom of the nut.

Limit switches

9007 Heavy Duty Industrial
Non-Plug-in Body, Metal
Hazardous Location

Type of head		Top plunger (mounting by the body)			
Hazardous location non-plug in body type					
Type of operator		Top roller plunger spring return	Top push rod plunger spring return	Top push rod plunger adjustable (1) spring return	Palm operated (2)
Catalog numbers					
1 N.O. 1 N.C. snap action		9007CR53D 	9007CR53E 	9007CR53ED 	9007CR53R (2) 
2 N.O. 2 N.C. snap action		9007CR61D 	9007CR61E 	9007CR61ED 	9007CR61R (2) 
2 N.O. 2 N.C. Two stage snap action		9007CR65D 	9007CR65E 	9007CR65ED 	9007CR65R (2) 
Weight, kg (lb)		1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)
Contact operation		 contact closed  contact open			
Characteristics (nominal operating data)					
Switch actuation		On end			
Type of actuation					
Pre-travel		2 mm (0.08 in.)			
Pre-travel two Stage	First stage	2 mm (0.08 in.)			
	First stage to second stage	0.3 mm (0.01 in.)			
Total travel		6.3 mm (0.25 in.)			
Differential		0.5 mm (0.02 in.)			
Reverse overtravel		—			
Minimum force or torque 1 pole & 2 pole		3 lb (13.3 N)			7 lb (31.1 N)
Terminal wire sizes (Cabling/Screw Clamp)		1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum			
Repeatability (linear travel of cam)		0.03 mm (0.001 in.)			
Cable entry		1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry			

(1) To lock the nut in the desired position, crimp the slot near the bottom of the nut.

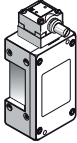
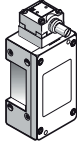
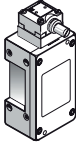
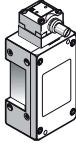
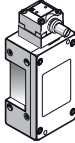
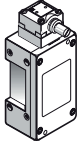
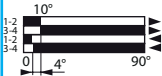
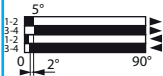
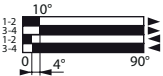
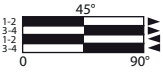
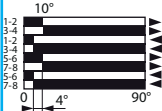
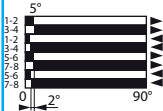
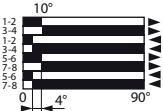
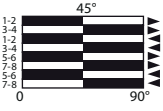
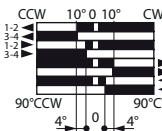
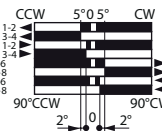
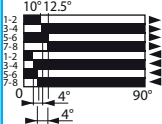
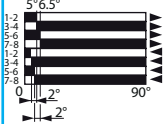
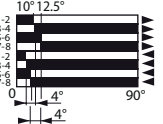
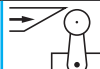
(2) Does not include mushroom button. Must be ordered separately, see page 42.

Limit switches

9007 Heavy Duty Industrial

Non-Plug-in Body, Metal

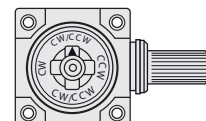
Hazardous Location

Type of head	Rotary (lever arm type) (1)					
Hazardous location non-plug-in body type						
Type of operator	Standard pre-travel spring return	Low differential spring return	Neutral position Standard pre-travel spring return Low differential spring return		Light operating torque spring return	Maintained contact
Type of direction	CW& CCW (2)	CW& CCW (2)	CW& CCW	CW& CCW	CW& CCW (2)	CW (trip) CCW (reset)
Catalog numbers						
1 N.O. 1 N.C. snap action	9007CR53B2 	9007CR53A2 			9007CR53N2 	9007CR53C 
2 N.O. 2 N.C. snap action	9007CR61B2 	9007CR61A2 			9007CR61N2 	9007CR61C 
2 N.O. 2 N.C. snap action Neutral position			9007CR67T10 	9007CR67T5 		
2 N.O. 2 N.C. Two stage snap action	9007CR65B2 	9007CR65A2 			9007CR65N2 	
Weight, kg (lb)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)
Contact operation	contact closed contact open					
Characteristics (nominal operating data)						
Switch actuation	By 30° cam					
Type of actuation						
Pre-travel	10°	5°	10°	5°	10°	45°
Pre-travel two Stage	10°	5°	—	—	10°	—
First stage						
First stage to second stage	2.5°	1.5°	—	—	2.5°	—
Total travel	90°					90°
Differential	4°	2°	4°	2°	4°	—
Reverse overtravel	90°					—
Operating torque/force 1 pole & 2 pole	4 lb-in (0.45 N•m)				25 oz-in (0.18 N•m)	3 lb-in (0.34 N•m)
Terminal wire sizes (Cabling/Screw Clamp)	1 or 2, 12–22 AWG (2.05–0.644 mm ²) wires maximum					
Repeatability (linear travel of cam)	0.05 mm (± 0.002 in.)	0.03 mm (± 0.001 in.)	0.05 mm (± 0.002 in.)	0.05 mm (± 0.002 in.)	0.05 mm (± 0.002 in.)	0.05 mm (± 0.002 in.)
Cable entry	1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry					

(1) Lever arm type must be ordered separately from page 43 to 48.

(2) These devices are factory set to operate the contacts in both the CW and CCW directions. Mode of operation is field convertible to CW only or CCW only. **To order factory converted devices:** For CCW only operation, change the 2 at the end of the Type number to 1 (for example: C54B2 becomes C54B1). For CW only operation, delete the 2 at the end of the Type number (for example, C54B2 becomes C54B).

Mode of operation of the lever arm is easily convertible to clockwise or both. Simply pull out and rotate the arrow to the letters representing the desired direction—CW, CCW, or CW/CCW.



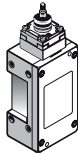
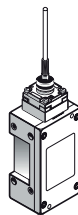
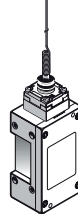
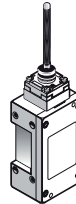
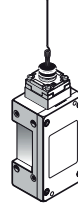
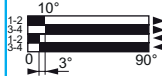
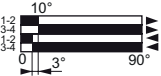
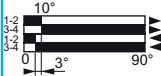
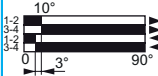
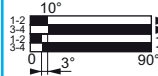
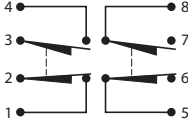
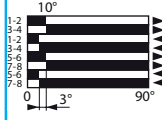
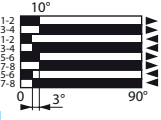
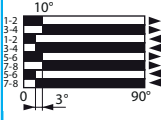
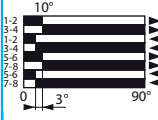
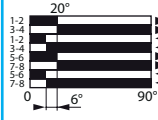
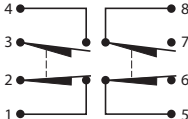
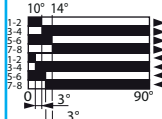
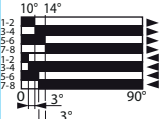
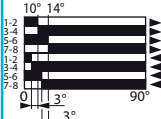
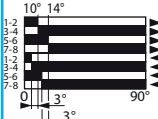
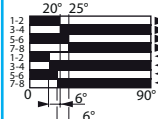
Dimensions:
page 57 to 58

Limit switches

9007 Heavy Duty Industrial

Non-Plug-in Body, Metal

Hazardous Location

Type of head Hazardous location non-plug-in body type	Multi-directional movement operator (wobble stick)				
					
Type of operator	Universal (1)	Wobble stick Delrin® extension (1)	Wobble stick wire extension (1)	Wobble stick coil spring extension (1)	Cat whisker
Catalog numbers					
1 N.O. 1 N.C. snap action 	9007CR53JKC 	9007CR53J 	9007CR53K 	9007CR53KC 	9007CR53L 
2 N.O. 2 N.C. snap action 	9007CR61JKC 	9007CR61J 	9007CR61K 	9007CR61KC 	9007CR61L 
2 N.O. 2 N.C. Two stage snap action 	9007CR65JKC 	9007CR65J 	9007CR65K 	9007CR65KC 	9007CR65L 
Weight, kg (lb)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)	1.020 (2.25)
Contact operation	 contact closed  contact open				
Characteristics (nominal operating data)					
Switch actuation	By any moving object from any direction				
Type of actuation					
Pre-travel	10° (any direction)				20°
Pre-travel two Stage	10° (any direction)				20°
First stage					
First stage to second stage	4°				5°
Total travel	90°				
Differential	3				6°
Reverse overtravel	—				
Operating torque/force 1 pole & 2 pole	3 lb-in (0.34 N•m)				7 oz-in (0.05 N•m)
Terminal wire sizes (Cabling/Screw Clamp)	1 or 2, 12–22 AWG (2.05–0.644 mm²) wires maximum				
Repeatability (linear travel of cam)	—				
Cable entry	1/2-14 NPT standard, optional M20 x 1.5 mm for ISO cable entry				

(1) Wobble stick extensions are available separately for the universal head or as replacements for complete devices. See page 42.

Limit switches

9007C Heavy Duty Industrial

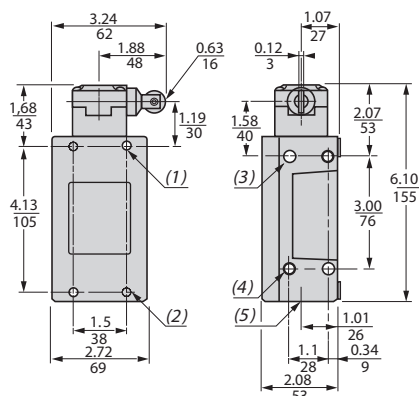
Non-Plug-in Body, Metal

Hazardous Location

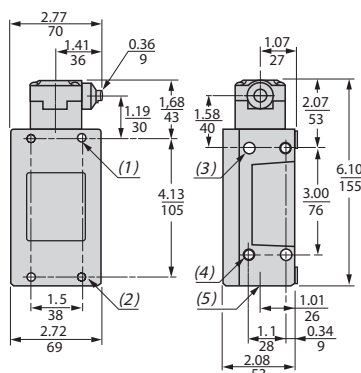
Dimensions

Side Plunger

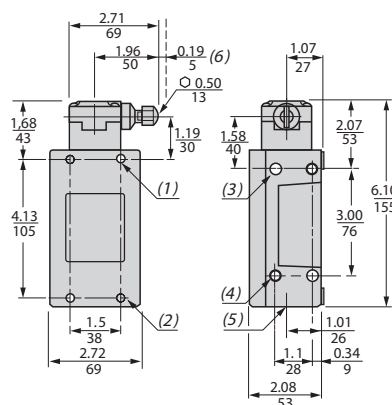
9007C•F



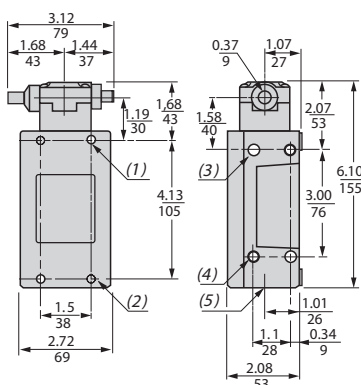
9007C•G



9007C•GD



9007C•H

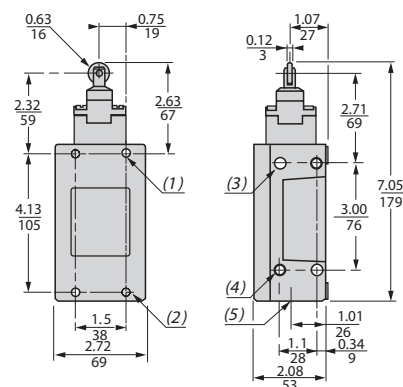


- (1) 2 x 0.27/7, front Mtg holes.
 (2) 2 x 0.63/16 1/4-20 DP UNC-2B back mounting holes.
 (3) 2 x 0.26/7 dia. holes.
 (4) 2 1/4-20 UNC-2B, both sides 0.32/8 DP.
 (5) 1/2 or 3/4 NPT.
 (6) Adjustable.

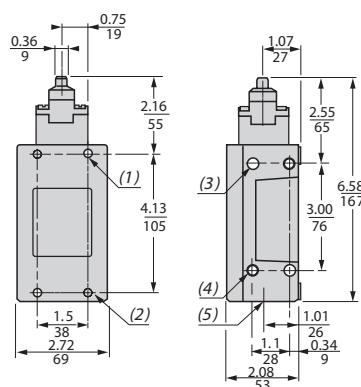
Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Top Plunger

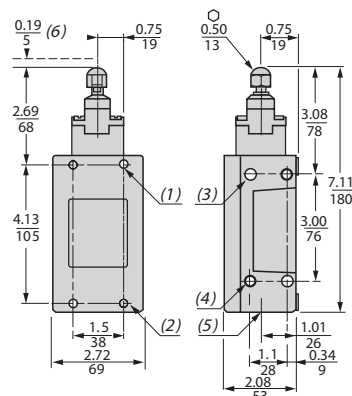
9007C•D



9007C•E



9007C•ED



- (1) 2 x 0.27/7, front Mtg holes.
 (2) 2 x 0.63/16 1/4-20 DP UNC-2B back mounting holes.
 (3) 2 x 0.26/7 dia. holes.
 (4) 2 1/4-20 UNC-2B, both sides 0.32/8 DP.
 (5) 1/2 or 3/4 NPT.
 (6) Adjustable.

Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

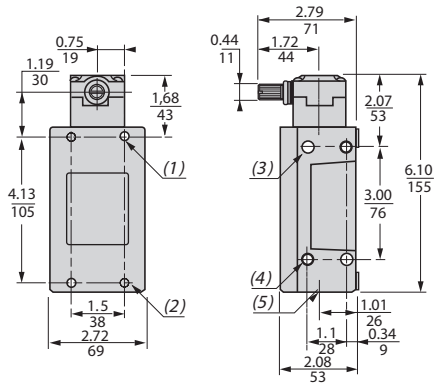
Limit switches

9007C Heavy Duty Industrial Non-Plug-in Body, Metal Hazardous Location

Dimensions

Rotary

9007C



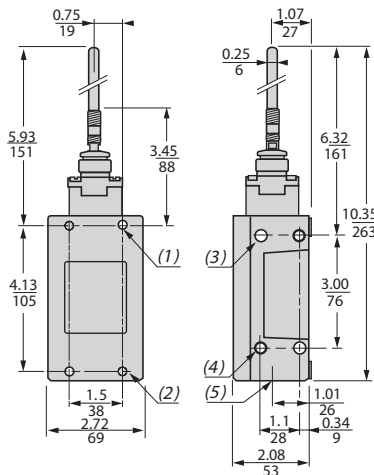
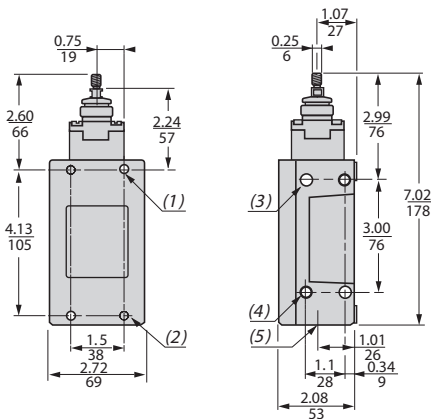
- (1) 2 x 0.27/7, front Mtg holes.
- (2) 2 x 0.63/16 1/4-20 DP UNC-2B back mounting holes.
- (3) 2 x 0.26/7 dia. holes, back Mtg. holes.
- (4) 2 1/4-20 UNC-2B, both sides 0.32/8 DP.
- (5) 1/2 or 3/4 NPT.

Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Wobble stick

9007C•JKC

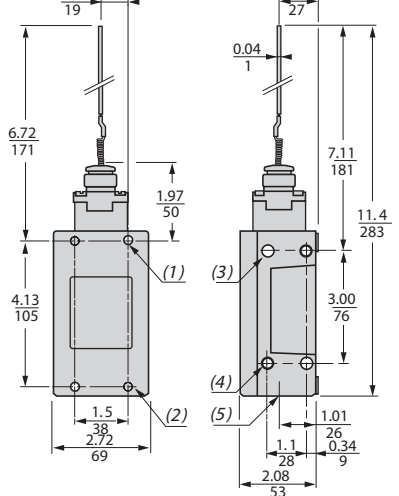
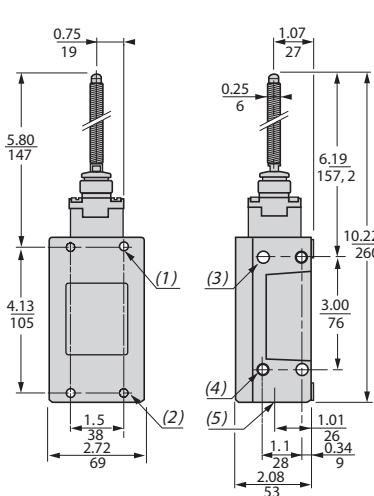
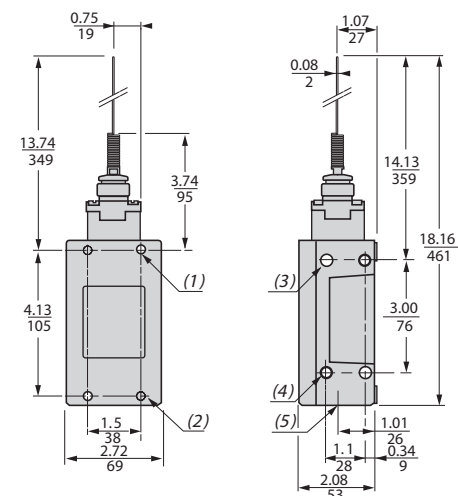
9007C•J



9007C•K

9007C•KC

9007C•L



- (1) 2 x 0.27/7, front Mtg holes.
- (2) 2 x 0.63/16 1/4-20 DP UNC-2B back mounting holes.
- (3) 2 x 0.26/7 dia. holes.
- (4) 2 1/4-20 UNC-2B, both sides 0.32/8 DP.
- (5) 1/2 or 3/4 NPT.
- (6) Adjustable.

Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Terminology

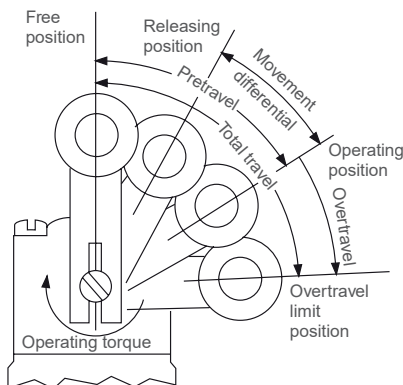


Figure 1: Rotary lever type

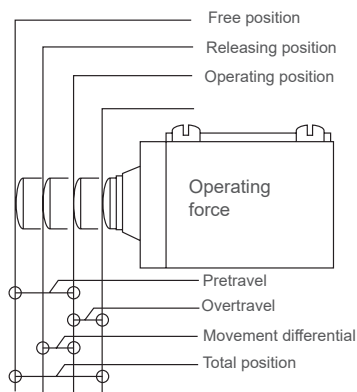


Figure 2: Rotary/Linear (or Plunger)

CCW	■ Counterclockwise only (for lever types).
CW	■ Clockwise only (for lever types).
Differential	■ The movement differential or differential is the distance or angle from the operating position to the releasing position.
Free or normal position	■ Free or normal position is the initial position of the actuator when there is no external force (other than gravity) applied on the actuator.
Neutral position	■ Free or normal Lever operated switch with a minimum of two contacts. One contact changes state only when lever moves CW. The second contact changes state only when the lever moves CCW. (The center position is the free position.)
Operating position	■ Operating position is the position of the actuator at which the contacts change state.
Overtravel	■ Overtravel is the distance or angle through which the actuator moves when traveling from the operating position to the overtravel limit position.
Pre-travel	■ Pre-travel is the distance or angle through which the actuator moves from the free position to the position at which the contacts change state, the operating position.
Release position	■ Release position is that position of the actuator at which the contacts change state from the operated contact position to the normal contact position.
Release torque	■ Release torque is the value to which the torque on the actuator must be reduced to allow the contacts to change state from the operated position to the normal contact position.
Actuator-lever	■ An actuator is the mechanism of the switch or enclosure which, when moved as intended, will operate the contacts.
Maintained contact limit switch	■ A maintained contact limit switch is a switch which remains in a given condition until actuated to another condition, which is also maintained until further actuation.
Momentary contact limit switch	■ A momentary contact limit switch is a switch which returns from the operated condition to its free or normal circuit condition when the actuating force is removed.
N.C.	■ Normally closed contact, when the switch mechanism is at its free or normal position.
N.O.	■ Normally open contact, when the switch mechanism is at its free or normal position.
Operating torque	■ Operating torque (force) is the minimum torque (force) value which must be applied to the actuator to cause the contacts to change state.
Overtravel limit position	■ Overtravel limit position is that position of the actuator beyond which further overtravel would cause damage to the switch or actuator.
Repeatability	■ Repeatability is the ability to consistently maintain the original operating characteristics. Measured by the difference between the operating position of a new switch and of the same after 1 million operations.
Total travel	■ Total travel is the sum of the pre-travel and overtravel.
Travel	■ Movement of the actuator from its free or normal position when force is applied. (See pre-travel and over travel.)

Terminology

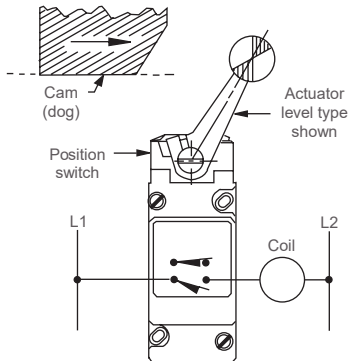


Figure 3: Limit Switch

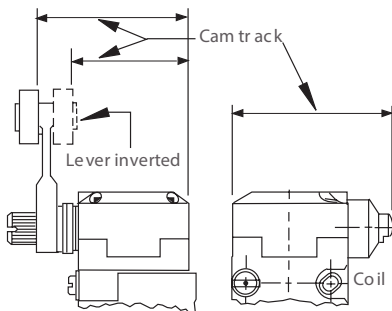


Figure 4: Cam track dimension

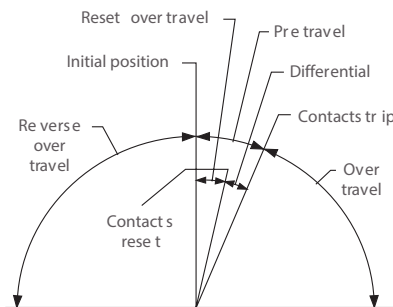


Figure 5: Contact travel

Definition of limit switch terms

There are many terms common to position switches that are not used with other control devices. Before proceeding further, definitions of the commonly used terms should be understood as these terms will be used throughout this document.

Limit switch	■ A device that converts a mechanical motion into an electrical control signal.
Actuator	■ The mechanism of a limit switch that operates the contacts, i.e., lever arm, plunger, wobble stick.
Cam	■ A machine part or component that applies force to the switch actuator causing it to move as intended. Also known as "dog".
Cam track dimension	■ The distance from the switch mounting surface to some point on the roller or actuator.
Differential	■ The distance that the limit switch actuator moves, from the trip point to the reset point of the contacts.
Direct-acting/positive opening contacts	■ Normally closed contacts that are moved directly by the operating shaft. They are slow make-slow break contacts and have a shorter life than snap action contacts due to longer arcing times. In general, these should only be used where movement of actuator must break welded contacts, as in a crane safety limit switch. (Snap action positive opening contacts are available in the Telemecanique® XCKJ limit switch.)
Maintained contacts	■ Contacts that remain in the tripped position until the return travel of the cam moves the switch actuator back and resets the contacts.
Neutral (free or normal) position limit switch	■ A lever arm type switch with two sets of contacts. One set operates when the shaft is rotated clockwise; the other operates when the shaft is rotated counterclockwise.
Operating force	■ The force required to move limit switch actuator to cause the contacts to change state.
Overtravel	■ The distance that the position switch actuator may move beyond the trip point, (see figure 5) without damage to the switch.
Pole	■ The number of moveable contacts in a switching mechanism. A single pole device may be 1 N.O., 1 N.C. or 1 N.O. and 1 N.C. with a single set of moveable contacts is used to bridge those stationary contacts. A double or two pole switch has two moveable contacts.
Positive break contacts	■ Normally closed contacts with a special mechanism to ensure opening. Can be snap acting positive break or direct acting slow make, slow break type. The slow break direct acting type is not recommended for high cycle applications due to shorter life.
Pre-travel	■ The distance that the limit switch actuator must move to trip the contacts.
Reed contacts	■ A mechanism consists of a set of contacts hermetically sealed in a glass envelope and actuated by a magnet attached to the operator. This sealed construction keeps contaminants out of the contact area, making the reed switch ideal for low voltage, low current circuits such as programmable controllers.
Reset point	■ The position of the actuator at which the contacts return to the normal position.
Snap action contacts	■ Contacts that move rapidly to open or closed position and are relatively independent of cam speed. Because of shorter arcing times, snap acting contacts have longer contact life than slow make and break contacts and should be used where fast moving cams are encountered or where good repeat accuracy is required.
Spring return	■ Contacts that return to their original position when the actuating force is removed.

Terminology

Slow break contacts	The speed of transfer of the moveable contacts depends on the speed of the operator. The amount of travel of the moveable contacts is also dependent on the amount of travel by the operator. Slow make and break contacts have the same trip and reset points, and do not have the differential travel common to snap switches.
Snap action contacts	The speed of transfer of the moveable contacts is not dependent on the speed of the operator. The amount of travel of the moveable contacts is also not dependent on the amount of travel by the operator. The movement of the moveable contacts are determined by a preset travel, after this point is reached, the contacts will trip. Snap action contacts have different trip and reset points, the difference is identified as "differential."
Flexible operators	Flexible resilient or elastic operators, i.e., wobble sticks, do not ensure direct opening/positive opening action.
Isolated contacts	Single-pole double-throw (SPDT) contacts with four terminals which have two isolated contact bars mechanically linked. No polarity restrictions apply. Different (isolated) power supplies can also be applied.
Same polarity	Single-pole double throw (SPDT) contacts with four terminals that require the supply to be applied with the same polarity (i.e., L1 or +) on the same side of the contact bar. Two different supplies are not allowed in this configuration. (The loads should always be on the same side of the contact bar.)
Direct opening contact (also known as positive opening contacts)	A normally closed contact element coupled with the switch actuator via a non-resilient (non-elastic) member so that full contact opening is obtained when the actuator is moved through the direct opening travel by applying a direct opening force. The contact element will shear open in the event of sticking contacts or broken springs. Proper fusing of the control circuit is required. Direct opening contacts meet IEC 60947-5-1 requirements.
Direct opening travel (also known as positive opening travel)	Minimum travel from the actuator free position to the position where the direct opening operation is completed. Usually longer than the normal pre-travel.
Reed contacts	Contact mechanism consists of a set of contacts hermetically sealed in a glass envelope and actuated by a magnet attached to the operator. This sealed construction keeps contaminants out of the contact area, making the reed switch the ideal switch for low voltage, low current circuits such as programmable controllers.

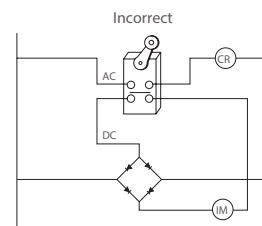
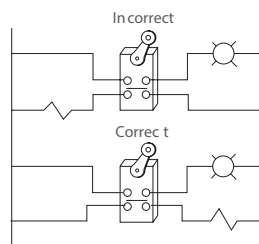
Note: Because reed switches are operated by a magnet, they should not be installed in areas where strong magnetic fields may be present. The devices should always be checked for proper operation after installation.

Polarity

Opposite polarities should not be connected to the contacts of one limit switch unless the limit switch is specifically designed for such service isolated contacts — no polarity). See page 62.

Power sources

Power from different sources should not be connected to the contacts of one limit switch unless the switch is specifically designed for such service (isolated contacts — no polarity).



Technical Information

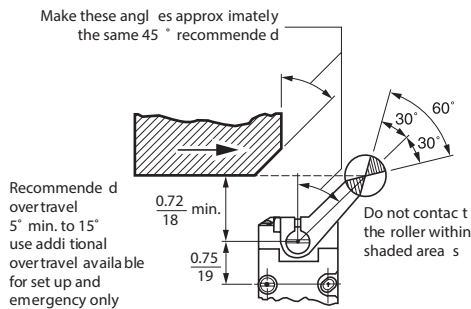


Figure 6

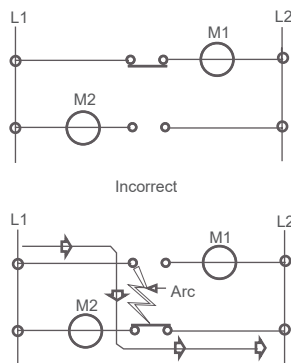


Figure 7: Contacts connected to opposite polarities. Line to line short (bold line) can occur through arc drawn when contacts operate

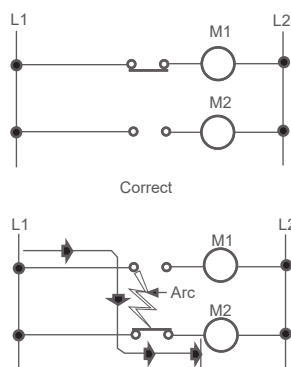


Figure 8: Contact connected to same polarity. Line to line short cannot occur when contacts operate

Overriding Cams

The cam trailing edge on overriding cams must also be considered for maximum switch life (see figure 6). Lever arm snap back causes shock loads which reduce switch life. Also, with reversing cams the trailing edge becomes a leading edge on the return stroke. The overtravel of the limit switch should not be exceeded, but 5° minimum to 15° travel past the trip point is recommended. Additional travel should only be used for set up and emergencies.

Contacts

- Make sure the electrical load is within limit switch contact ratings.
- The single pole, double throw contacts of a snap switch used in a limit switch should not be used on opposite polarities. When load M1 is connected between the contact and line L2, and load M2 is connected between the other contact and line L1 (figure 7), a line-to-line short (bold line) can occur through the arc, which may be drawn as the contacts operate. When contacts are connected to the same polarity (figure 8), this line-to-line short cannot occur.
- The same result can occur if different power sources are connected to the single-pole, double-throw contacts of a snap switch.
- With limit switches having reed contacts, some form of transient protection should be used. This protects the small contacts from damaging surges and increases contact life.

Coolant

- When possible, avoid mounting limit switches where they will be constantly exposed to coolant, chips, etc. Although designed for such applications, switches last longer when not exposed to these contaminants.
- Make sure cover screws are tightened to ensure a good oiltight seal.
- When possible, avoid using fire-resistant coolants of the phosphate ester type. Equipment exposed to these coolants requires special seals and gaskets. Viton® fluoroelastomer, resistant to these types of coolants, is the standard shaft seal material on Type C lever arm types. If required, all gaskets, as well as boots on plunger types, can be furnished in Viton material.

Recommendations of Conduit Installation

Limit switch leakage is often traced to the conduit system. Coolant or condensation in the conduit line can enter the switch through the conduit entry. Oil tightness depends on the condition of the conduit connection and seal. Recommendations for installing conduit to position switches are as follows:

- To ensure an oiltight seal, use thread sealant and a conduit seal or a sealing bushing around the conduit fitting. Otherwise, the fitting probably will leak.
- Limit switches should be installed with the conduit end down whenever possible.
- If condensation or moisture is present inside the conduit, a conduit seal can be inserted into the conduit entry. The conduit fitting can then be connected in the normal manner. Thread sealant and a sealing bushing must still be used.
- Often a junction box fills with coolant and/or condensation, which backs up into the position limit through the conduit. A simple solution is to drill a hole in the bottom of the junction box to allow the liquid to drain out.
- If conduit leakage is severe, pre-wired and potted position limit (Forms Y184• and Y185•) should be used. The switches are pre-wired with either individual wires or multiconductor STOWA cord, and the receptacle is sealed with a potting material.
- The limit switch is available with a pre-wired male plug receptacle. The connector provides an effective oiltight seal when used with the appropriate female connector cord.

Terminal Identification

European (IEC) contact terminals marking

Single pole	Double pole	
	1 st pole	2 nd pole
11-12	11-12	21-22
13-14	13-14	23-24
11-12	11-12	21-22
13-14	13-14	23-24

Each terminal is marked with 2 digits: First digit indicates the pole (circuit). The second digit

indicates the type of contact:

_1-_2 is N.C., _3-_4 is N.O.

i.e.: 11-12, 21-22 are N.C. 13-14, 23-24 are N.O.

Example of European Terminal Markings:

For switch elements without isolated contacts:

11-12 is the N.C. contact of pole No. 1, 13-14 is the N.O. contact of pole No. 2

For switch elements with isolated contacts:

13-14 is the N.O. contact of pole No. 1, 21-22 is the N.C. contact of pole No. 2

Example of US Terminal Markings

Single pole	Double pole	
	1 st pole	2 nd pole
1-2	1-2	5-6
3-4	3-4	7-8
1-2	1-2	5-6
3-4	3-4	7-8

Each contact terminal is marked with one digit, i.e., 1-2, 3-4, 5-6, 7-8.

Example of US Terminal Markings:

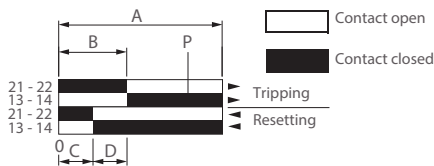
For most snap switch elements (isolated contacts not usually on US manufactured switches):

1-2 is the N.C. contact of pole No. 1,

3-4 is the N.O. contact of pole No. 1,

5-6 is the N.C. contact of pole No. 2,

7-8 is the N.O. contact of pole No. 2



Make-before-break

- (overlapping) SPDT: the normally open contact closes before the normally closed contact opens.

Break-before-break

- (offset) SPDT: the normally closed contact opens before the normally open contact closes.

Simultaneous make and break

- SPDT: the normally closed contact opens at the same time as the normally open contact closes.

A = Maximum travel of the operator in mm or degrees.

B = Tripping travel of the contact.

C = Resetting travel of contact.

D = B-C = Differential travel.

P = Point from which positive opening is assured.

NOTE: The arrows indicate direction of actuation clockwise (CW) and return for simplicity reasons. For counterclockwise (CCW) only direction of actuation is reversed.

Wiring diagrams

Form A

SPST-NO



Form B

SPST-NC



Form C

SPDT



Form AA

DPST-NO



Form BB

DPST-NO



Form CC

DPDT



Form X

SPST-NC-DB



Form Y

SPST-NC-DB



Form Zb

SPDT isolated contacts



Form Z

DPDT-DB



Form XX

DPST-NO-DB



Form YY

DPST-NC-DB



Form ZZ

DPDT-DB



Cam Design

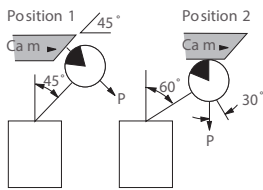


Figure 1A: Cam design for speeds up to 50 fpm

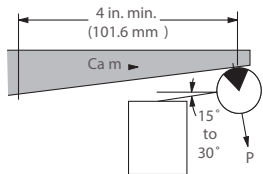


Figure 1B: Cam design for speeds from 50 to 200 fpm (15.2 to 60.9 mpm)

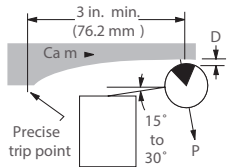


Figure 1C: Cam design for speeds from 200 to 400 fpm (60.9 to 121.9 mpm)

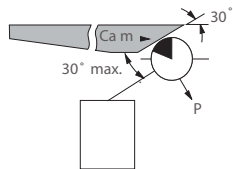


Figure 2

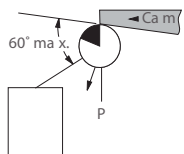


Figure 3

Application information

Excessive impact from improperly designed actuating systems is without question the leading cause of premature failure of the electromechanical limit switch. At slow speed, impact is rarely troublesome, but as speed increases, impact applied to the switch becomes a critical problem. In today's higher speed machines, therefore, it is important to give proper consideration to correctly designed actuating systems.

These recommendations are designed to assist you in obtaining greater life from your limit switches. The black sector in the roller indicates the recommended design limits of the angle of pressure shown in the illustrations as "P". Three main design and installation considerations are:

- The pressure applied by the actuating mechanism to switch operating lever should approximate direction of lever rotation with a variation not to exceed 30°.
- Since the angle of pressure changes drastically with rotation of the lever, the cam must be designed for proper pressure angles at all positions of the lever travel.
- The switch operating levers should be positioned as nearly parallel with the leading edges of the cams as possible.

Considering these three factors:

- The cam in Figure 1A is satisfactory for speeds up to 50 fpm (15.2 mpm)
- The cam in Figure 1B is suitable for speeds up to 200 fpm (60.9 mpm) (nonuniform acceleration of switch lever)
- The cam in Figure 1C is satisfactory for speeds up to 400 fpm (121.9 mpm) (uniform or other controlled acceleration) and the conduit fitting. Otherwise, the fitting probably will leak.

Designing proper pressure angles for overriding cams for electromechanical limit switches

Don't underestimate the importance of adjusting the cams and operating levers in electromechanical limit switches to provide the proper pressure angles in every travel position. Without the means to control the angle of pressure or the limit of override, the operating lever may spring back with damaging results.

Lever flyback usually causes double pulsing of the contacts, and places additional stresses on the mechanical system of the limit switch. The excessive impacts absorbed from inadequately designed actuating devices eventually leads to abnormal wear and premature failure of the limit switch.

By looking closely at the actuating angles of the cam surface, designers and engineers can obtain the maximum operating life from electromechanical limit switches. The following recommendations help provide a workable knowledge of proper lever and cam angles—and how they are applied to secure optimum conditions:

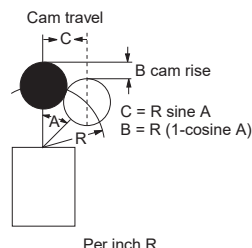
- Actuating cam on machinery or slide should provide a trailing edge so that upon overriding the operating lever will not snap back.
- During the approach phase, **the pressure angle of the cam should not vary from the lever angle more than 30°.**
- On the override phase, **the angle of the trailing edge of the cam to the lever should be no more than 60°.**

If these guidelines are followed, the switch operating levers will always be approximately parallel with the leading edges of the actuating surfaces or cams.

Figure 2 shows leading edge of cam about to depress and actuate the electromechanical limit switch. The black sector of the roller indicates the recommended design limits of the angle of pressure shown in drawings as "P".

Figure 3 shows operating lever roller following the trailing edge of the cam on the override cycle. Unless a one-way lever is used, the cam will operate the switch on the return cycle.

Linear/Angular Lever Travel



Application information (continued)

The table below can assist the designer of machine tools and conveyors, the plant engineer, or the maintenance personnel responsible for keeping this equipment in a satisfactory operating condition.

The design engineer will find the table useful in making trouble-free cam layouts. For example, if the recommended operating travel for a switch is between 15° and 30°, use the table to figure cam rise and travel. This aids in determining what type of cam to design, its dimensions, etc.

The plant engineer can use the table to determine where to position levers on replacement switches or revamped circuitry to operate existing cams. The engineer can also use the table to position the lever in proper relationship to the cam, and to find out whether switches and cams are installed properly to obtain maximum switch life.

All dimensions in the table are for 1 in. (25.4 mm) levers. If you use longer levers, multiply the figures by the increased lever length. For example, for a 2 in. (50.8 mm) lever, use the multiplier 2.

All limit switches have a recommended operating travel and for best performance should be installed within these limits.

Dual dimensions: in. (mm)

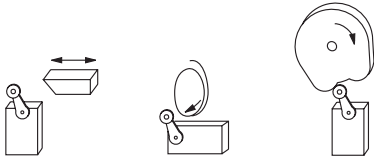
A	B	C	A	B	C
1°	0.0002 (0.005 mm)	0.017 (0.43 mm)	46°	0.305 (7.7 mm)	0.719 (18.2 mm)
2°	0.0006 (0.015 mm)	0.035 (0.89 mm)	47°	0.318 (8.1 mm)	0.731 (18.6 mm)
3°	0.0014 (0.035 mm)	0.052 (1.3 mm)	48°	0.331 (8.4 mm)	0.743 (18.9 mm)
4°	0.002 (0.05 mm)	0.070 (1.8 mm)	49°	0.344 (8.7 mm)	0.755 (19.2 mm)
5°	0.004 (0.101 mm)	0.087 (2.2 mm)	50°	0.357 (9.0 mm)	0.766 (19.4 mm)
6°	0.005 (0.127 mm)	0.105 (2.6 mm)	51°	0.371 (9.4 mm)	0.777 (19.7 mm)
7°	0.007 (0.178 mm)	0.122 (3.1 mm)	52°	0.384 (9.7 mm)	0.788 (20.0 mm)
8°	0.010 (0.254 mm)	0.139 (3.5 mm)	53°	0.398 (10.1 mm)	0.799 (20.3 mm)
9°	0.012 (0.304 mm)	0.156 (4.0 mm)	54°	0.412 (10.4 mm)	0.809 (20.5 mm)
10°	0.015 (0.381 mm)	0.174 (4.4 mm)	55°	0.426 (11.0 mm)	0.819 (20.8 mm)
11°	0.018 (0.457 mm)	0.191 (4.8 mm)	56°	0.441 (11.2 mm)	0.829 (21.0 mm)
12°	0.022 (0.559 mm)	0.208 (5.3 mm)	57°	0.455 (11.5 mm)	0.839 (21.3 mm)
13°	0.026 (0.660 mm)	0.225 (5.7 mm)	58°	0.485 (12.3 mm)	0.857 (21.7 mm)
14°	0.030 (0.762 mm)	0.242 (6.1 mm)	59°	0.485 (12.3 mm)	0.857 (21.7 mm)
15°	0.034 (0.863 mm)	0.259 (6.6 mm)	60°	0.500 (12.7 mm)	0.866 (22 mm)
16°	0.039 (0.990 mm)	0.276 (7.2 mm)	61°	0.515 (13.1 mm)	0.875 (22.2 mm)
17°	0.044 (1.12 mm)	0.292 (7.4 mm)	62°	0.531 (13.5 mm)	0.883 (22.4 mm)
18°	0.049 (1.24 mm)	0.309 (7.8 mm)	63°	0.546 (14.0 mm)	0.891 (22.6 mm)
19°	0.054 (1.37 mm)	0.326 (8.3 mm)	64°	0.562 (14.3 mm)	0.899 (22.8 mm)
20°	0.060 (1.52 mm)	0.342 (8.7 mm)	65°	0.577 (14.6 mm)	0.906 (23.0 mm)
21°	0.066 (1.67 mm)	0.358 (9.1 mm)	66°	0.593 15.0(mm)	0.914 (23.2 mm)
22°	0.073 (1.85 mm)	0.375 (9.5 mm)	67°	0.609 15.5(mm)	0.921 (23.4 mm)
23°	0.079 (2.00 mm)	0.391 (9.9 mm)	68°	0.625 (16.0 mm)	0.927 (23.5 mm)
24°	0.086 (2.2 mm)	0.407 (10.3 mm)	69°	0.642 (16.3 mm)	0.934 (23.7 mm)
25°	0.094 (2.38 mm)	0.423 (10.7 mm)	70°	0.658 (16.7 mm)	0.940 (23.9 mm)
26°	0.101 (2.56 mm)	0.438 (11.1 mm)	71°	0.674 (17.1 mm)	0.946 (24.0 mm)
27°	0.109 (2.77 mm)	0.454 (11.5 mm)	72°	0.691 (17.5 mm)	0.951 (24.1 mm)
28°	0.117 (2.9 mm)	0.469 (12 mm)	73°	0.708 (18.0 mm)	0.956 (24.3 mm)
29°	0.125 (3.17 mm)	0.485 (12.3 mm)	74°	0.724 (18.4 mm)	0.961 (24.4 mm)
30°	0.134 (3.40 mm)	0.500 (12.7 mm)	75°	0.741 (19.0 mm)	0.966 (24.5 mm)
31°	0.143 (3.6 mm)	0.515 (13.1 mm)	76°	0.758 (19.2 mm)	0.970 (24.6 mm)
32°	0.152 (3.9 mm)	0.530 (13.4 mm)	77°	0.775 (20.0 mm)	0.974 (24.7 mm)
33°	0.161 (4.1 mm)	0.545 (14.0 mm)	78°	0.792 (20.1 mm)	0.978 (24.8 mm)
34°	0.171 (4.3 mm)	0.559 (14.2 mm)	79°	0.809 (20.5 mm)	0.982 (24.9 mm)
35°	0.181 (4.6 mm)	0.574 (14.6 mm)	80°	0.826 (21.0 mm)	0.985 (25.0 mm)
36°	0.191 (4.8 mm)	0.588 (15 mm)	81°	0.844 (21.4 mm)	0.988 (25.1 mm)
37°	0.201 (5.1 mm)	0.602 (15.3 mm)	82°	0.861 (21.8 mm)	0.990 (25.1 mm)
38°	0.212 (5.4 mm)	0.616 (15.6 mm)	83°	0.878 (22.3 mm)	0.993 (25.2 mm)
39°	0.223 (5.7 mm)	0.629 (16.0 mm)	84°	0.895 (22.7 mm)	0.995 (25.3 mm)
40°	0.234 (6.0 mm)	0.643 (16.3 mm)	85°	0.913 (23.2 mm)	0.996 (25.3 mm)
41°	0.245 (6.2 mm)	0.656 (16.6 mm)	86°	0.930 (23.6 mm)	0.9976 (25.3 mm)
42°	0.257 (6.5 mm)	0.669 (17.0 mm)	87°	0.948 (24.0 mm)	0.9986 (25.4 mm)
43°	0.269 (6.8 mm)	0.682 (17.3 mm)	88°	0.965 (24.5 mm)	0.9994 (25.4 mm)
44°	0.281 (7.1 mm)	0.695 (17.6 mm)	89°	0.983 (25.0 mm)	0.9999 (25.4 mm)
45°	0.293 (7.4 mm)	0.707 (18 mm)	90°	1.000 (25.4 mm)	1.000 (25.4 mm)

Installation Considerations

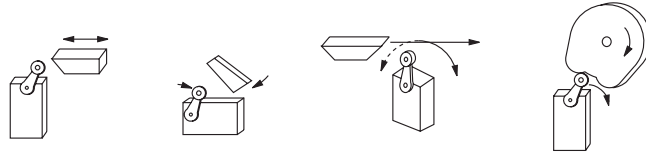
Lever Actuators

For limit switches with lever actuators, the actuating force should be applied as nearly perpendicular to the lever as practical and perpendicular to the shaft axis about which the lever rotates.

Correct



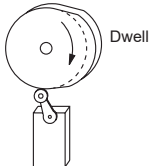
Incorrect



Dwelling requirements

Where relatively fast motions are involved, the cams should be so designed that the limit switch will be held operated long enough to operate relays, valves, etc.

Correct

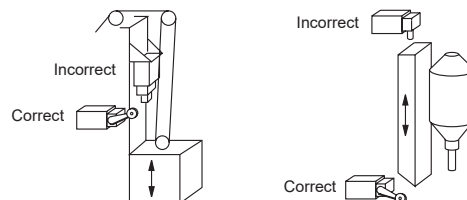


Incorrect

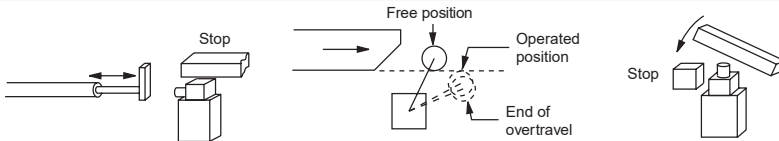


Overtravel limitations

Operating mechanisms for limit switches should be so designed that, under any operating or emergency conditions, the limit switch is not operated beyond its overtravel limit position. A limit switch should not be used as a mechanical stop.



Correct



Limit switches

9007T and FT Severe Duty Mill and Foundry Switches

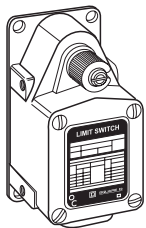
Conforming to NEMA A600 and UL508

Description

9007T Mill Switches

Use the 9007T Mill switches instead of other limit switches in the following applications:

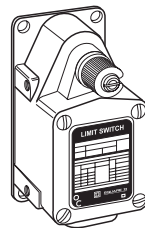
- Where the current load exceeds the typical heavy duty limit switch contact rating of 10 A and falls within the range of up to 20 A continuous. 0 fpm (15.2 mpm)
- Where an operating sequence is required that is not possible on other limit switches. Fifteen sequences are available. Universal type has twelve different operating sequences with CW only, CCW only and neutral position. Standard type has three operating sequences with CW and CCW operation.
- Where higher reset forces are required due to foreign material interfering with lever arm operation, or where long heavy arms must reset against gravity. The cam in Figure 1C is satisfactory for speeds up to 400 fpm (121.9 mpm) (uniform or other controlled acceleration) and the conduit fitting. Otherwise, the fitting probably will leak.



Page 68 to 71

9007FT Foundry Switches

The 9007FT Foundry switches are for use in foundries or mills where the applications described above are required, and where falling foundry sand or similar material could build up and jam the operating mechanism. The shaft has a dust boot and extends from the switch case, preventing sand build up around the shaft. The devices can withstand hot falling sand up to 300° F (149° C.).



Page 72 to 74

Application Information

Type T

- Ideal for applications requiring extra heavy duty contact ratings, or higher operating and reset forces. Rugged mechanical construction with several different operating sequences in one basic switch.

Type FT

- Designed specifically for rough foundry application. The shaft is entirely beyond the switch case to prevent jamming of the lever arm due to build up of sand. A dust boot is furnished as standard to further prevent sand packing and allow free movement of the lever arm. An extra long shaft bearing makes the switch extremely rugged and able to handle the rough applications encountered in foundries, mills, machine tool and similar industries. The switch will withstand hot falling sand up to 300° F (149° C.).

Type T and Type FT

Enclosure

- Oil-tight, dust-tight, water-tight, drip-tight meets NEMA Types 2, 4, and 13 requirements. Die cast zinc construction.

Operating Sequences

- Fifteen sequences available. Universal type has 12 different operating sequences with CW only, CCW only, and neutral position operation. Standard type has three operating sequences with CW and CCW operation. Various sequences will give quick make and break,

Ambient Temperature Range

- 10° F (-12.2° C) to 185° F (85° C) ambient at full rated load, up to 220° F (104° C) ambient with single coil load.

Lever Arm

- Die cast zinc construction with hardened, oil-impregnated, sintered iron rollers.

Conduit

- 0.5 in. standard / 20 mm optional — Form M11.

Mounting

- Four baseplates provide end or side mounting holes and/or manifold mounting. All mounting holes are 0.25 in. (6.35 mm) diameter. Two tapped holes on each side of switch allows side mounting.

Contacts

- SPDT ⁽¹⁾ double break and three point double throw single break. Silver contact tips. Phenolic contact block. Nylon liner. Polarity must be the same on double throw contacts.

(1) Single pole, double throw.

Limit switches

9007T and FT Severe Duty Mill and Foundry Switches

Conforming to NEMA A600 and UL508

Environmental characteristics

Conformity to standards	UL508
Product certifications	UL Listed, CSA Certified, CE Marked
Protective treatment	Corrosion resistant gray paint
Ambient air temperature	-10 to +185 °F (-23 to +85 °C) Housing can withstand falling sand at +300 °F (+149 °C)
Vibration resistance	10G (10–55 Hz)
Shock resistance	30G
Protection against electric shock	Class 0
Degree of protection	NEMA Types 1, 2, 4, 12, 13, IP65, 66, 67
Cable entry or connector	1/2" NPT (metric available)
Materials	Cast zinc

Contact block characteristics

Rated operational characteristics	AC Voltage	NEMA A600 Ithe = 20 A 20 A Resistive and continuous
Rated operational characteristics	DC Voltage	NEMA P 600 Ithe = 20 A 20 A Resistive and continuous
Rated insulation voltage		600 V
Rated impulse withstand voltage		2,500 Vac for 1 minute for CE, 2,200 Vac for 1 minute for UL, and 2,640 Vac for 1 minute for CSA
Positive opening		No
Short circuit protection		20 A Bussmann Class CC KTK-R-20 fuse, non-time-delay
Terminal wire sizes (Cabling/Screw Clamp)		12 – 22 AWG (3.31 mm ² – 0.326 mm ²) wire max.
Maximum actuation speed		15.2 mpm / 27.4 mpm (50 fpm / 90 fpm) with 45° Cam angle, levers only

Maximum current ratings for control circuit contacts

Contacts	AC								DC				
	Volts	Inductive 35% Power Factor					Resistive 75% Power Factor			Volts	Inductive and Resistive		
		Make		Break		Continuous Carrying Amperes	Make, Break and continuous carrying Amperes		Make and Break Amperes		Continuous Carrying Amperes		
		Amperes	VA	Amperes	VA				Single Throw			Double Throw	
SPDT	120	150	18,000	20	2400	20	20		120	5.0	°	20	
Quick Make and Break	240	75	18,000	12.5	3000	20	20		250	1.0	°	20	
	480	37.5	18,000	6.25	3000	20	20		600	0.2	°	20	
	600	30	18,000	5	3000	20	20						
All Slow Make and Break	120	60	7200	6	720	20	10	20	20	—	—	—	
	240	30	7200	3	720	20	10	20	20	—	—	—	
	480	15	7200	1.5	720	20	10	20	20	—	—	—	
	600	12	7200	1.2	720	20	10	20	20	—	—	—	

Characteristics for material and ratings comparisons — standard switches

	9007 Type T/FT	Type L (R. B. Denison® Loxxswitch™)
Body material	Cast zinc	Cast aluminum
Cover material	Cast zinc	Aluminum
Base plate material	Steel with zinc plating	Steel with chromate plating
Shaft seal material	Nitrile	PVC
Contact block material	Phenolic	Glass filled nylon
Moveable contact material	Fine silver on copper backing	Coin Silver on steel backing
Stationary contact material	Fine silver on copper backing	90/10 AgCdO on copper backing
Low ambient temperature rating	-10° F	0° F
High ambient temperature at full rating (1)	180° F	200° F
Enclosure rating	NEMA Types 1, 2, 4, 12 and 13	NEMA Types 1, 4 and 13
Vibration resistance	10G (10–150 Hz)	40G max (10-150 Hz)

(1) Many switches are available with higher or lower temperature limits by selecting special versions or special options. See page 92.

Limit switches

9007T Severe Duty Mill Switches

Conforming to NEMA A600 and UL508

Universal Catalog Numbers

Base Plate							
Surface Mounted	A	9007TUA1	9007TUA2	9007TUA3	9007TUA4	9007TUA5	9007TUA6
	B	9007TUB1	9007TUB2	9007TUB3	9007TUB4	9007TUB5	9007TUB6
	C	9007TUC1	9007TUC2	9007TUC3	9007TUC4	9007TUC5	9007TUC6
	D	9007TUD1	9007TUD2	9007TUD3	9007TUD4	9007TUD5	9007TUD6



No. 1	No. 2	No. 3 (4)	No. 4	No. 5	No. 6
SPDT Spring Return CW Only	SPDT Spring Return CW Only	SPDT Maintained Contact	SPDT Spring Return Neutral Position	SPDT Spring Return CW Only	SPDT Spring Return CW Only
Initial position and CCW CW 	Initial position and CCW Middle CW Final CCW 	Spring return of arm to initial pos. Contact pos. maintained until operated in reverse direction CCW CW If high speed cam or snap-back is present, use No. 12	Initial position CCW CCW 	Initial position and CW CCW 	Initial position and CW Middle CCW Final CCW

Characteristics

Nominal Operating Data

Pre-travel (1)	14°	Int. Pos. 9°, Final 16°	7°	6°	14°	Int. Pos. 9°, Final 16°
Total travel	88°	88°	81°	81°	88°	88°
Differential	12°	5°	7°	5°	12°	5°
Operating torque	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)
Repeat accuracy (2)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)

To convert sequences, remove base plate, position plate and latches. Reassemble positioning plate and latches as shown.

Weight lb (kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)

Footnotes : see page 71.

Limit switches

9007T Severe Duty Mill Switches

Universal Operating Sequences

Universal Catalog Numbers

Base Plate

Surface Mounted	A	9007TUA7	9007TUA8	9007TUA9	9007TUA10	9007TUA11	9007TUA12
	B	9007TUB7	9007TUB8	9007TUB9	9007TUB10	9007TUB11	9007TUB12
	C	9007TUC7	9007TUC8	9007TUC9	9007TUC10	9007TUC11	9007TUC12
	D	9007TUD7	9007TUD8	9007TUD9	9007TUD10	9007TUD11	9007TUD12



No. 7	No. 8 (4)	No. 9	No. 10	No. 11	No. 12
SPDT Maintained	SPDT Maintained Neutral Position	SPDT Spring Return Slow Make, Slow Break	SPDT Spring Return Slow Make, Slow Break	SPDT Spring Return Slow Make, Slow Break	SPDT Maintained
If high speed cam or snap-back present, use No. 12	Initial position If high speed cam or snap-back is present, use No. 12	Initial position and CCW	Initial position	Initial position and CW	CCW
CCW	CCW CW	CW	CCW CW	CCW	CW

Characteristics

Nominal Operating Data

Pre-travel (1)	10°	6°	12°	3°	12°	45°
Total travel	85°	81°	87°	81°	87°	90°
Differential	12°	10°	0°	0°	0°	0°
Operating torque	2.5 lb-in (0.28 N.m)	2.5 lb-in (0.28 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	8 lb-in (0.9 N.m)
Repeat accuracy (2)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)

To convert sequences, remove base plate, position plate and latches. Reassemble positioning plate and latches as shown.

						Not adjustable
Weight lb (kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)

Footnotes : see page 71.

Limit switches

9007T Severe Duty Mill Switches

Standard Operating Sequences

Universal Catalog Numbers

Base Plate				
Surface Mounted	A	9007TSA1	9007TSA2	9007TSA3
	B	9007TSB1	9007TSB2	9007TSB3
	C	9007TSC1	9007TSC2	9007TSC3
	D	9007TSD1	9007TSD2	9007TSD3



No. 1	No. 2	No. 3
SPDT Spring Return CW & CCW	SPDT Spring Return CW & CCW	SPDT Spring Return CW & CCW Slow Make, Slow Break
Initial position 	Initial position 	Initial position 
CW and CCW 	Middle 	Final 
		CW and CCW 

Characteristics

Nominal Operating Data

Switch actuation	By 30° cam		
Type of actuation			
Pre-travel (1)	14°	Int. Pos. 9°, Final 16°	9°
Total travel	89°	89°	89°
Differential	12°	Int. Pos. 5.5°, Final 7.5°	5°
Reverse overtravel	N/A (future availability)	N/A (future availability)	N/A (future availability)
Operating torque/force 1 pole & 2 pole	10 lb-in (1.13 N.m)	10 lb-in (1.13 N.m)	10 lb-in (1.13 N.m)
Terminal wire sizes (Cabling/Screw Clamp)	#12–22 AWG (3.31–0.326 mm²)	#12–22 AWG (3.31–0.326 mm²)	#12–22 AWG (3.31–0.326 mm²)
Repeatability (2) (linear travel of cam)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)
Cable entry (metric available)	1/2" NPT	1/2" NPT	1/2" NPT
Weight lb (kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)	2.35 lb. (1.07 kg)

(1) The pre-travel listed may vary up to 5° additional for universal switches or up to 2° additional for standard switches due to free travel of lever arm at initial position.

(2) Linear travel of cam on 1.5 in. (38.1mm) lever arm.

(3) Remove spring from the positioning plate.

(4) Sequence 3, 7, and 8 devices are available but are not recommended where high speed cams or lever arm snap-back is present.

The application should be checked and No. 12 sequences substituted where possible.

Note: For Type FT foundry switches, change the "T" at the beginning of the equivalent Type number above to "FT" (Example: FTUB1). See page 72 to 74.

Limit switches

9007FT Severe Duty Foundry Switches

Universal Operating Sequences

Universal Catalog Numbers

Base Plate

Surface Mounted	A	9007FTUA1	9007FTUA2	9007FTUA3	9007FTUA4	9007FTUA5	9007FTUA6
	B	9007FTUB1	9007FTUB2	9007FTUB3	9007FTUB4	9007FTUB5	9007FTUB6
	C	9007FTUC1	9007FTUC2	9007FTUC3	9007FTUC4	9007FTUC5	9007FTUC6
	D	9007FTUD1	9007FTUD2	9007FTUD3	9007FTUD4	9007FTUD5	9007FTUD6



No. 1	No. 2	No. 3 (4)	No. 4	No. 5	No. 6
SPDT Spring Return CW Only	SPDT Spring Return CW Only	SPDT Maintained Contact	SPDT Spring Return Neutral Position	SPDT Spring Return CW Only	SPDT Spring Return CW Only
Initial position and CCW 	Initial position and CCW 	Spring return of arm to initial pos. Contact pos. maintained until operated in reverse direction CCW CW 	Initial position 	Initial position and CW 	Initial position and CW
CW 	Middle CW Final CCW 	If high speed cam or snap-back is present, use No. 12	CCW CCW 	CCW 	Middle CCW Final CCW

Characteristics

Nominal Operating Data

Pre-travel (1)	14°	Int. Pos. 9°, Final 16°	7°	6°	14°	Int. Pos. 9°, Final 16°
Total travel	88°	88°	81°	81°	88°	88°
Differential	12°	5°	7°	5°	12°	5°
Operating torque	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)
Repeat accuracy (2)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)

To convert sequences, remove base plate, position plate and latches. Reassemble positioning plate and latches as shown.

Weight lb (kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)

Footnotes : see page 74.

Limit switches

9007FT Severe Duty Foundry Switches

Universal Operating Sequences

Universal Catalog Numbers

Base Plate							
Surface Mounted	A	9007FTUA7	9007FTUA8	9007FTUA9	9007FTUA10	9007FTUA11	9007FTUA12
	B	9007FTUB7	9007FTUB8	9007FTUB9	9007FTUB10	9007FTUB11	9007FTUB12
	C	9007FTUC7	9007FTUC8	9007FTUC9	9007FTUC10	9007FTUC11	9007FTUC12
	D	9007FTUD7	9007FTUD8	9007FTUD9	9007FTUD10	9007FTUD11	9007FTUD12



No. 7	No. 8 (4)	No. 9	No. 10	No. 11	No. 12
SPDT Maintained	SPDT Maintained Neutral Position	SPDT Spring Return Slow Make, Slow Break	SPDT Spring Return Slow Make, Slow Break	SPDT Spring Return Slow Make, Slow Break	SPDT Maintained
If high speed cam or snap-back present, use No. 12	Initial position If high speed cam or snap-back is present, use No. 12	Initial position and CCW	Initial position	Initial position and CW	CCW
CCW	CCW CW	CW	CCW CW	CCW	CW

Characteristics

Nominal Operating Data						
Pre-travel (1)	10°	6°	12°	3°	12°	45°
Total travel	85°	81°	87°	81°	87°	90°
Differential	12°	10°	0°	0°	0°	0°
Operating torque	2.5 lb-in (0.28 N.m)	2.5 lb-in (0.28 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	12 lb-in (1.35 N.m)	8 lb-in (0.9 N.m)
Repeat accuracy (2)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)

To convert sequences, remove base plate, position plate and latches. Reassemble positioning plate and latches as shown.

						Not adjustable
Weight lb (kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)

Footnotes : see page 74.

Limit switches

9007FT Severe Duty Foundry Switches

Universal Operating Sequences

Universal Catalog Numbers

Base Plate

Surface Mounted	A	9007FTSA1	9007FTSA2	9007FTSA3
	B	9007FTSB1	9007FTSB2	9007FTSB3
	C	9007FTSC1	9007FTSC2	9007FTSC3
	D	9007FTSD1	9007FTSD2	9007FTSD3



No. 1	No. 2	No. 3
SPDT Spring Return CW & CCW	SPDT Spring Return CW & CCW	SPDT Spring Return CW & CCW Slow Make, Slow Break
Initial position 	Initial position 	Initial position 
CW and CCW 	Middle  Final 	CW and CCW 

Characteristics

Nominal Operating Data

Switch actuation	By 30° cam		
Type of actuation			
Pre-travel (1)	14°	Int. Pos. 9°, Final 16°	9°
Total travel	89°	89°	89°
Differential	12°	Int. Pos. 5.5°, Final 7.5°	5°
Reverse overtravel	N/A (future availability)	N/A (future availability)	N/A (future availability)
Operating torque/force 1 pole & 2 pole	10 lb-in (1.13 N.m)	10 lb-in (1.13 N.m)	10 lb-in (1.13 N.m)
Terminal wire sizes (Cabling/Screw Clamp)	#12–22 AWG (3.31–0.326 mm²)	#12–22 AWG (3.31–0.326 mm²)	#12–22 AWG (3.31–0.326 mm²)
Repeatability (2) (linear travel of cam)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)	± 0.004 in. (0.10 mm)
Cable entry (metric available)	1/2" NPT	1/2" NPT	1/2" NPT
Weight lb (kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)	2.57 lb (1.17 kg)

(1) The pre-travel listed may vary up to 5° additional for universal switches or up to 2° additional for standard switches due to free travel of lever arm at initial position.

(2) Linear travel of cam on 1.5 in. (38.1 mm) lever arm.

(3) Remove spring from the positioning plate.

(4) Sequence 3, 7, and 8 devices are available but are not recommended where high speed cams or lever arm snap-back is present. The application should be checked and No. 12 sequences substituted where possible.

Note: For Type FT foundry switches, change the "T" at the beginning of the equivalent Type number above to "FT" (Example: FTUB1).

Limit switches

9007T and FT Severe Duty Mill and Foundry Switches

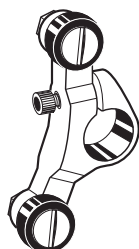
Lever Arms and Renewal Parts



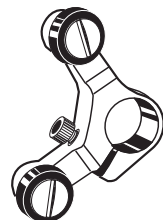
Standard Roller



Offset Type



120° Forked



90° Forked

Standard Roller

Arm Length in. (mm)	Steel Roller			Catalog Number	Weight lb (kg)
	Diameter in. (mm)	Roller Position	Width in. (mm)		
1.5 (38.1)	0.75 (19)	Optional	0.25 (6.3)	9007B1	0.17 (0.077)
1.5 (38.1)	1.0 (25.4)	Optional	0.25 (6.3)	9007B2	0.19 (0.086)
1.5 (38.1)	1.38 (35)	Optional	0.25 (6.3)	9007B3	0.23 (0.104)
2.5 (63.5)	0.75 (19)	Optional	0.25 (6.3)	9007B7	0.25 (0.113)
2.5 (63.5)	1.0 (25.4)	Optional	0.25 (6.3)	9007B8	0.25 (0.113)
2.5 (63.5)	1.38 (35)	Optional	0.25 (6.3)	9007B9	0.27 (0.122)
1.5 (38.1)	0.75 (19)	Optional	0.5 (12.7)	9007B12	0.34 (0.154)
1.5 (38.1)	1.0 (25.4)	Optional	0.5 (12.7)	9007B13	0.34 (0.154)
1.5 (38.1)	1.38 (35)	Optional	0.5 (12.7)	9007B14	0.42 (0.191)
5 (127)	0.75 (19)	Optional	0.25 (6.3)	9007B19	1.00 (0.454)
2.88 (73.1)	0.75 (19)	No roller	—	9007B21	0.20 (0.091)
2.5 (63.5)	0.75 (19)	Optional	0.5 (12.7)	9007B22	0.22 (0.100)
2.5 (63.5)	1.0 (25.4)	Optional	0.5 (12.7)	9007B23	0.28 (0.127)
2.5 (63.5)	1.38 (35)	Optional	0.5 (12.7)	9007B24	0.36 (0.163)
Adjustable (1)	0.75 (19)	Optional	0.25 (6.3)	9007R18	0.50 (0.227)
Adjustable (1)	1.0 (25.4)	Optional	0.25 (6.3)	9007R19	0.50 (0.227)
Adjustable (1)	1.38 (35)	Optional	0.25 (6.3)	9007R20	0.50 (0.227)

(1) Does not include lever arm clamp or rod. If lever arm clamp is required, use 9007R16 or R17.

Offset Type (for obtaining different cam track dimensions)

Arm Length in. (mm)	Steel Roller			Catalog Number	Weight lb (kg)
	Diameter in. (mm)	Roller Position	Width in. (mm)		
1.5 (38.1)	0.75 (19)	Inside offset	0.25 (6.3)	9007C1	0.50 (0.227)
1.5 (38.1)	1.0 (25.4)	Inside offset	0.25 (6.3)	9007C2	0.50 (0.227)
1.5 (38.1)	1.38 (35)	Inside offset	0.25 (6.3)	9007C3	0.50 (0.227)
1.5 (38.1)	0.75 (19)	Outside offset	0.25 (6.3)	9007D1	0.18 (0.082)
1.5 (38.1)	1.0 (25.4)	Outside offset	0.25 (6.3)	9007D2	0.18 (0.082)
1.5 (38.1)	1.38 (35)	Outside offset	0.25 (6.3)	9007D3	0.18 (0.082)
1.88 (48)	0.75 (19)	Outside offset	0.25 (6.3)	9007E4	0.20 (0.091)
1.88 (48)	1.0 (25.4)	Outside offset	0.25 (6.3)	9007E5	0.27 (0.122)
1.88 (48)	1.38 (35)	Outside offset	0.25 (6.3)	9007E6	0.27 (0.122)
1.88 (48)	0.75 (19)	Inside offset	0.25 (6.3)	9007F4	0.30 (0.136)
1.88 (48)	1.0 (25.4)	Inside offset	0.25 (6.3)	9007F5	0.30 (0.136)
1.88 (48)	1.38 (35)	Inside offset	0.25 (6.3)	9007F6	0.30 (0.136)

120° Forked (for maintained contact lever arm type switches)

Arm Length in. (mm)	Steel Roller			Catalog Number	Weight lb (kg)
	Diameter in. (mm)	Roller Position	Width in. (mm)		
1.5 (38.1)	0.75 (19)	Same side	0.25 (6.3)	9007J1	0.31 (0.141)
1.5 (38.1)	1.0 (25.4)	Same side	0.25 (6.3)	9007J2	0.40 (0.181)
1.5 (38.1)	0.75 (19)	LH on opp. side	0.25 (6.3)	9007K1	0.50 (0.227)
1.5 (38.1)	1.0 (25.4)	LH on opp. side	0.25 (6.3)	9007K2	0.50 (0.227)
1.5 (38.1)	0.75 (19)	RH on opp. side	0.25 (6.3)	9007N1	0.66 (0.299)
1.5 (38.1)	1.0 (25.4)	RH on opp. side	0.25 (6.3)	9007N2	0.70 (0.316)

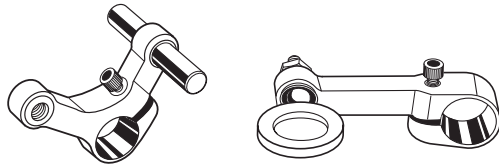
90° Forked (for maintained contact lever arm type switches)

Arm Length in. (mm)	Steel Roller			Catalog Number	Weight lb (kg)
	Diameter in. (mm)	Roller Position	Width in. (mm)		
1.5 (38.1)	0.75 (19)	Same side	0.25 (6.3)	9007X1	0.30 (0.136)
1.5 (38.1)	1.0 (25.4)	Same side	0.25 (6.3)	9007X2	0.40 (0.181)
1.5 (38.1)	0.75 (19)	RH on opp. side	0.25 (6.3)	9007Y1	0.50 (0.227)
1.5 (38.1)	1.0 (25.4)	RH on opp. side	0.25 (6.3)	9007Y2	0.50 (0.227)
1.5 (38.1)	0.75 (19)	LH on opp. side	0.25 (6.3)	9007Z1	0.66 (0.299)
1.5 (38.1)	1.0 (25.4)	LH on opp. side	0.25 (6.3)	9007Z2	0.70 (0.316)

Limit switches

9007T and FT Severe Duty Mill and Foundry Switches

Lever Arms and Renewal Parts



With Reset

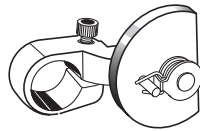
Cable Operated

Rod Type
(rod not included)

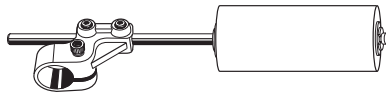
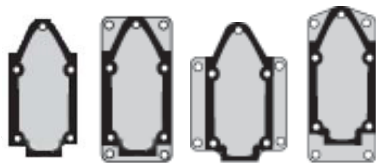
Ball Bearing Type



Weld-On Type



1-Way Roller Type

Conveyor Side Guide
(use with 9007R16 or R17)Style A
Base Plates

Style B

Style C

Style D

Standard Roller

Arm	Steel Roller			Catalog Number	Weight lb (kg)
Length in. (mm)	Diameter in. (mm)	Roller Position	Width in. (mm)		
1.5 (38.1)	0.75 (19)	None	None	9007Y3	—
2.5 in. (63.5mm) long with eyebolt 0.25 (6.3mm) I.D. instead of roller.				9007B27	—

Rod Type (used on conveyor systems or where unusual shapes are required)

Adjustable	0.75 (19)	0.19 (4.8)	None	9007R16	0.18 (0.081)
Adjustable	0.75 (19)	0.25 (6.3)	None	9007R17	0.18 (0.081)

(1) Rod not included

(2) Key stock not included

Ball Bearing Type (for abrasive dust areas or with high speed cams)

1.5 (38.1)	0.75 (19)	Center	0.28 (7.1)	9007B16	0.15 (0.068)
------------	-----------	--------	------------	----------------	--------------

Weld-On Type (used where a special operator is required to weld to lever)

3.5 (89)	0.75 (19)	None	None	9007G10	0.50 (0.227)
----------	-----------	------	------	----------------	--------------

One Way Roller Type (used with reversible cams for one way operations)

1.5 (38.1)	0.75 (19)	Outside offset	0.25 (6.3)	9007D4	0.64 (0.290)
------------	-----------	----------------	------------	---------------	--------------

Conveyor Side Guide

8.44 in. (214.3) long with 1.5 in. (38.1) dia. 3.75 in. (95.2) Delrin® roller	9007R21	1.63 (0.739)
---	----------------	--------------

8.44 in. (214.3) long with 0.88 in. (22.3) dia. 3.75 in. (95.2) Delrin roller	9007R22	1.42 (0.644)
---	----------------	--------------

Separate Base Plates (2)

Length in. (mm)	Diameter in. (mm)	Roller Position	Width in. (mm)	Catalog Number	Weight lb (kg)
A	None			2934D32G1	—
B	End			2934D14G1	0.34 (0.154)
C	Side			2934D33G1	0.42 (0.191)
D	End			2934D34G1	0.36 (0.163)

(1) No mounting holes in base plate. Side mounting holes in switch case must be used.

(2) Acceptable wire sizes 14–18 AWG (2.08–0.823 mm²); recommended terminal clamp torque 13–16 lb-in. (1.46–1.80 N•m).

Optional Conduit Threads

Description metric				Catalog Number	Weight lb (kg)
Length in. (mm)	Diameter in. (mm)	Roller Position	Width in. (mm)		
M20 - 20mm (per B.S. 4568)				M11	—

Example: 9007TUB4M11

Three Point Contacts — Ordering Information

Select Type number of desired contact operating sequence for standard contact switch. Change the letter following "T" or "FT" as shown below.

Change:

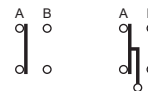
For example:
TUB1 changes to TYB1
TSB1 changes to TKB1

U to Y

S to K

Contact Configuration Changes

From:



Limit switches

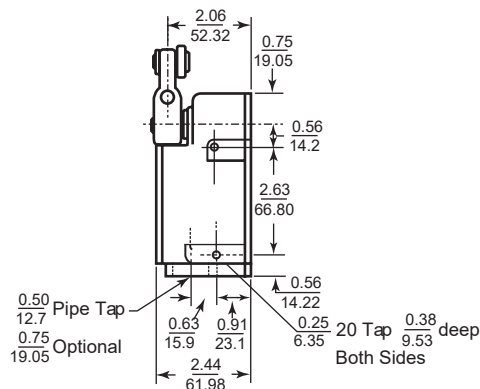
9007T and FT Severe Duty Mill and Foundry Switches

Lever Arms and Renewal Parts

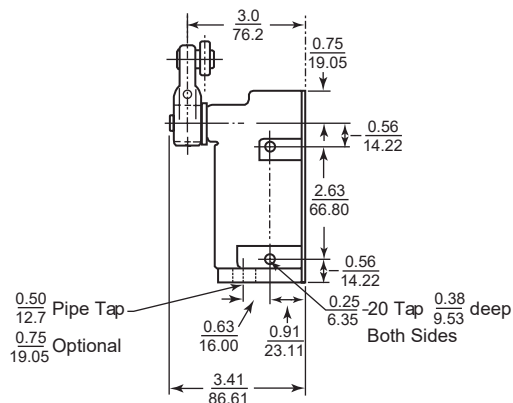
Dimensions

Surface Mounting

Type T

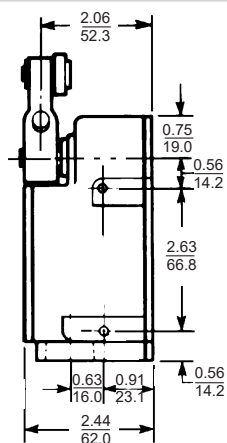


Type FT

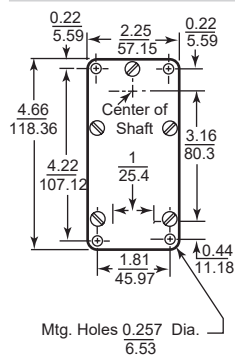


Base Plates

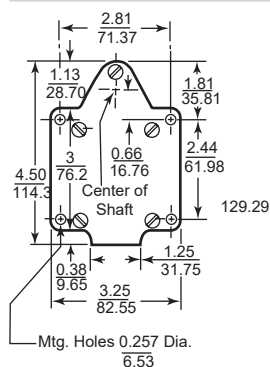
Style A



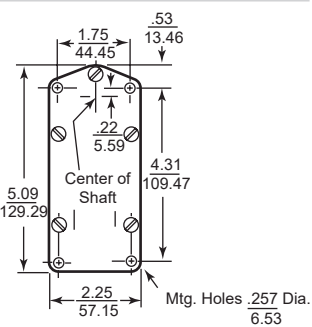
Style B



Style C



Style D



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Limit switches

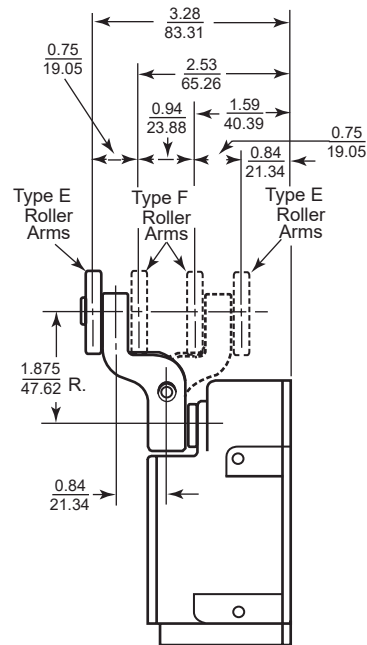
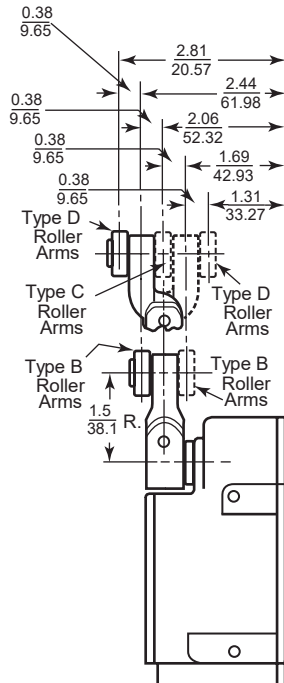
9007T and FT Severe Duty Mill and Foundry Switches

Lever Arms and Renewal Parts

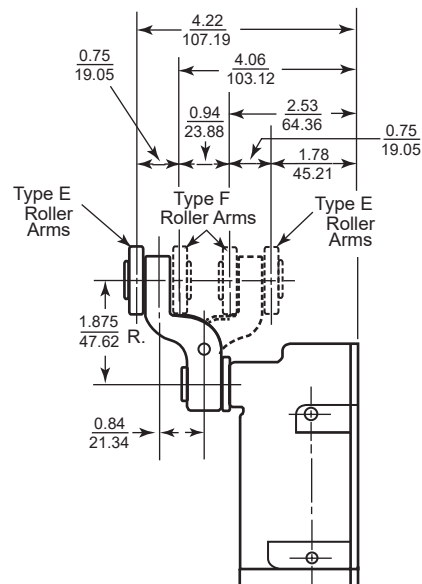
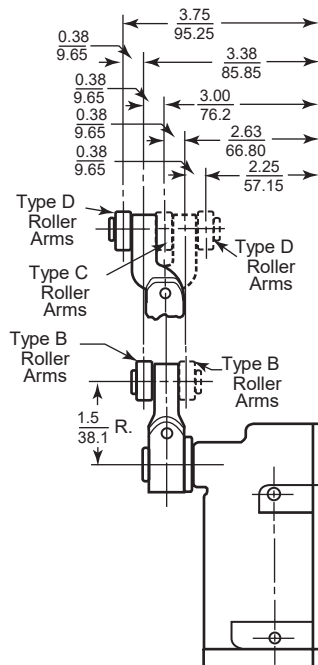
Dimensions

CAM Track

Type T



Type FT



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Limit switches

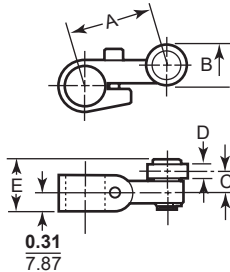
9007T and FT Severe Duty Mill and Foundry Switches

Lever Arms and Renewal Parts

Dimensions

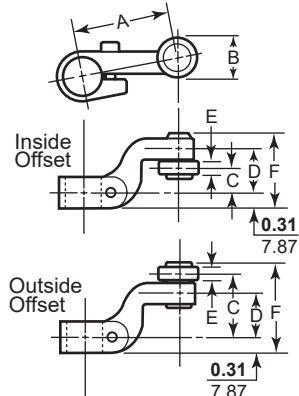
Type T and FT Lever Arms

Standard Roller

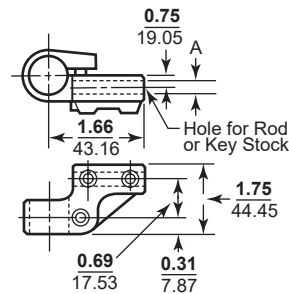


For dimension A refer to page 75.

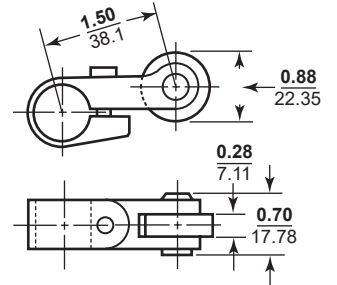
Offset Type



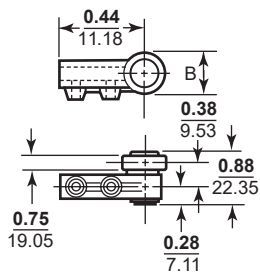
Adjustable Length Rod Type



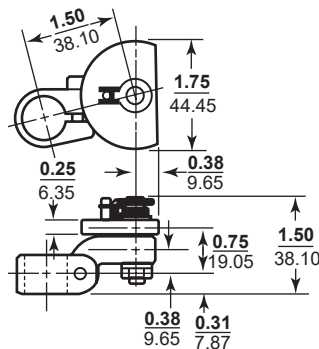
Ball Bearing Roller Type B16



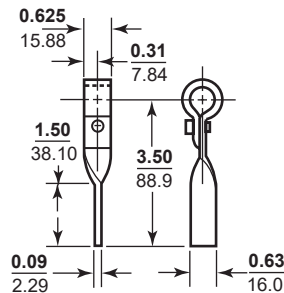
Roller Arm for use with Type R17



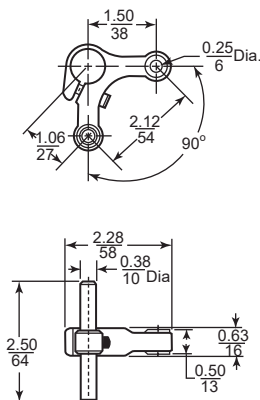
1-Way Roller Type D4



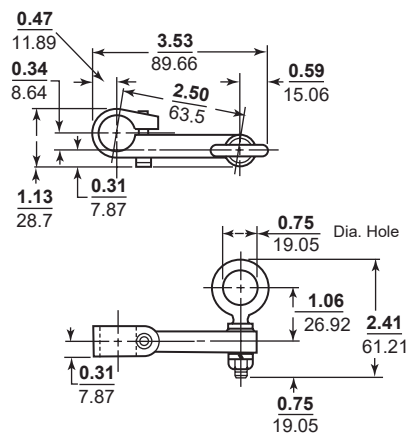
Weld-On Arm Type G10



Cable Operated with Reset Type Y3



Cable Operated Type B27



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

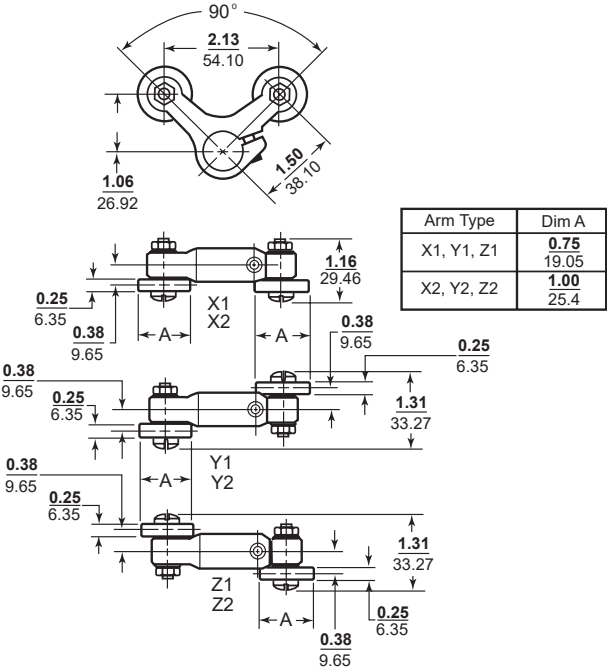
NOTE: All levers on this page can be used on Type C limit switches by installing the 9007S9 hub.

Limit switches
9007T and FT Severe Duty Mill and Foundry
Switches
Lever Arms and Renewal Parts

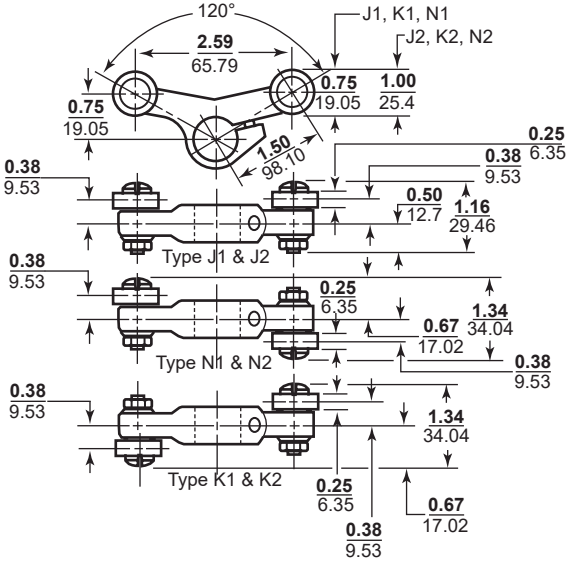
Dimensions

Type T and FT Lever Arms

90° Forked



120° Forked



Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Features L100, L300, L140, L2153, L525

- Captive cover screws.
- Heavy duty snap action mechanism prevents teasing or false contact opening.
- Positive trip action prevents the lever from slipping around the 0.5 in. (12.7 mm) shaft even if not properly tightened.
- High current capability. 20 A maximum continuous.
- Isolated (no polarity) double and triple circuits with double break (throw) action.
- Wide 0.25 in. (6.3 mm) contact gap ensures very high shock and vibration resistance.
- Easy-to-access contacts allow for easy inspection and replacement.
- Stamped contact configuration number for easy identification even if the switch is painted.
- Many contact arrangements to solve difficult applications.
- Model L300 is an extra heavy duty version for very aggressive environments:
 - The booted shaft design prevents penetration of foreign materials such as sand, dust, or grit between the shaft and the bushing.
 - Heavy duty stainless steel springs and hardened spring operators permit longer life under extreme lever fly-back and high impact.
 - Same parameters as L100 models, except that the distance between the back of the switch and the lever is increased by 0.34 in. (8.6 mm).
- Two and three circuits in CW, CCW, neutral position, spring return and maintained, snap action or slow-make slow-break, two steps (L525) are available.
- Two circuit models can be CW or CCW field converted.
- Wide range of options: high shock and vibration, with gold contact, low or very high temperature.
- 0.5 in. (12.7 mm) NPT conduit entrance standard on 2-pole models (5 wires max.).
- 0.75 in. (19 mm) NPT conduit entrance standard on 3-pole models (7 wires max.).

Description

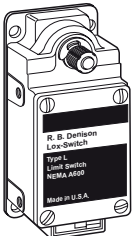
L100, L300 Switches (fixed sequence)

L100 Mill (1)

Use the L100W Mill switches instead of other limit switches in the following applications:

- Where the current load exceeds the typical heavy duty limit switch contact rating of 10 A and falls within the range of up to 20 A continuous.
- Where an operating sequence is required that is not possible on other limit switches (35 choices with the L switches).
- Where higher reset forces are required due to foreign material interfering with lever arm operation, or where long heavy arms must reset against gravity.

(1) L switches are not preceded by 9007. They are known as the R.B.Denison® Loxswitch™ L, and include conveyor belt and slack cable pull switches in the product offering.



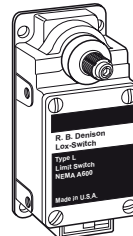
Page 83 to 84

L300 Foundry

The L300W Foundry switches are for use in foundries or mills where the applications described above are required, and where falling foundry sand or similar material could build up and jam the operating mechanism. The shaft has a dust boot and extends from the switch case, preventing sand buildup around the shaft. The devices can withstand hot falling sand up to 300° F (149° C).

Model L300 is an extra heavy duty version for very aggressive environments:

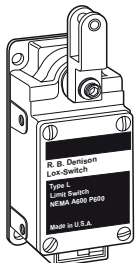
- The booted shaft design prevents penetration of foreign materials such as sand, dust, or grit between the shaft and the bushing
- Heavy duty stainless steel springs and hardened spring operators permit longer life under extreme lever fly-back and high impact.
- Same parameters as L100 models, except that the distance between the back of the switch and the lever is increased by 0.34 in. (8.6 mm).



Page 85 to 86

Cable Pulls (fixed sequence)

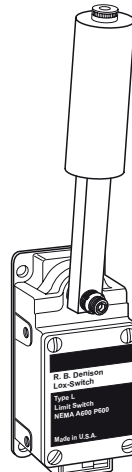
L140 Mill and Foundry



Page 87

Belt Conveyors

L525 Mill and Foundry



Page 88

Conveyor belt limit switches are ideal for policing the lateral movement of belt conveyors. When the conveyor belt shifts, it contacts the switch roller and a 12° movement of the lever transfers the first set of contacts. This set is usually wired to initiate a warning alarm system to alert the worker that the belt is moving off the rollers. Further lateral movement of the belt, causing the lever to move another 8°, trips the second set of contacts. These contacts are normally wired to the conveyor drive system, and when actuated, stop the system—minimizing damage to the conveyor, or loss of material on the belt.

L2153 Mill and Foundry



Page 87

Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches
L100, L300 Mill and Foundry Switches, L140, L2153
Cable Pulls, L529 Belt Conveyor

Environmental characteristics	
Conformity to standards	UL508
Product certifications	UL Listed, CSA Certified, CE Marked
Protective treatment	Corrosion resistant gray paint
Ambient air temperature	-10 to +185 °F (-23 to +85 °C) With H prefix: -10 to +350 °F (-23 to +177 °C). (1)
Vibration resistance	10G (10–55 Hz)
Shock resistance	30G
Protection against electric shock	Class 0
Degree of protection	NEMA Types 1, 2, 4, 12, 13, IP65, 66, 67
Cable entry or connector	1/2" NPT (metric available)
Materials	Cast zinc

(1) For a switch with an ambient temperature rating up to 350 °F (177 °C), add an **H** to the beginning of the catalog number.
For example, change catalog number L100WS2M2 to HL100WS2M2.

Contact block characteristics	
Rated operational characteristics hard contacts	AC Voltage NEMA A600 lthe = 20 A 20 A Resistive and continuous
Rated operational characteristics hard contacts	DC Voltage NEMA P 600 lthe = 20 A 20 A Resistive and continuous
Rated insulation voltage	600 V
Rated impulse withstand voltage	2,500 Vac for 1 minute for CE, 2,200 Vac for 1 minute for UL, and 2,640 Vac for 1 minute for CSA
Positive opening	No
Short circuit protection	20 A Bussmann Class CC KTK-R-20 fuse, non-time-delay
Terminal wire sizes (Cabling/Screw Clamp)	12 – 22 AWG (3.31 mm² – 0.326 mm²) wire max.
Maximum actuation speed	15.2 mpm / 27.4 mpm (50 fpm / 90 fpm) with 45° Cam angle, levers only

Maximum current ratings for control circuit contacts												
Contacts	AC							DC				
	Volts	Inductive 35% Power Factor			Resistive 75% Power Factor			Volts	Inductive and Resistive			
		Make		Break	Continuous Carrying		Make, Break and continuous carrying		Make and Break Amperes		Continuous Carrying	
		Amperes	VA	Amperes	VA	Amperes	Amperes		Single Throw	Double Throw	Amperes	
SPDT	120	150	18,000	20	2400	20	20	120	5.0	°	20	
Quick Make and Break	240	75	18,000	12.5	3000	20	20	250	1.0	°	20	
	480	37.5	18,000	6.25	3000	20	20	600	0.2	°	20	
	600	30	18,000	5	3000	20	20					
All Slow Make and Break	120	60	7200	6	720	20	10	20	—	—	—	
	240	30	7200	3	720	20	10	20	—	—	—	
	480	15	7200	1.5	720	20	10	20	—	—	—	
	600	12	7200	1.2	720	20	10	20	—	—	—	

Characteristics for material and ratings comparisons — standard switches		
	9007 Type T/FT	Type L (R. B.Denison® Loxswitch™)
Body material	Cast zinc	Cast aluminum
Cover material	Cast zinc	Aluminum
Base plate material	Steel with zinc plating	Steel with chromate plating
Shaft seal material	Nitrile	PVC
Contact block material	Phenolic	Glass filled nylon
Moveable contact material	Fine silver on copper backing	Coin Silver on steel backing
Stationary contact material	Fine silver on copper backing	90/10 AgCdO on copper backing
Low ambient temperature rating	-10° F	0° F
High ambient temperature at full rating (1)	180° F	200° F
Enclosure rating	NEMA Types 1, 2, 4, 12 and 13	NEMA Types 1, 4 and 13
Vibration resistance	10G (10–150 Hz)	40G max (10-150 Hz)

(1) Many switches are available with higher or lower temperature limits by selecting special versions or special options. See page 92.

Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches L100 Mill Switches

L100 Mill Switches					
Description	Operating Torque	Contact Diagram	Catalog Number	Operating Data	Weight, lb (kg)
Snap-action CW spring return	190 oz-in (1.34 N.m)		L100WS2M1	A (see next page)	1.51 (0.68)
Snap-action CCW spring return	190 oz-in (1.34 N.m)		L100WS2M2	A (see next page)	1.51 (0.68)
Maintained contact ■ CW and CCW snap action	45 oz-in (0.32 N.m)		L100WS2M3	A (see next page)	1.51 (0.68)
Snap action CW spring return	190 oz-in (1.34 N.m)		L100WDR2M4	A (see next page)	1.51 (0.68)
Snap-action CCW spring return	190 oz-in (1.34 N.m)		L100WDR2M5	A (see next page)	1.51 (0.68)
Maintained contact ■ CW and CCW snap action	45 oz-in (0.32 N.m)		L100WDR2M6	A (see next page)	1.51 (0.68)
Snap action CCW spring return	190 oz-in (1.34 N.m)		L100WDL2M7	A (see next page)	1.51 (0.68)
Snap-action CW spring return	190 oz-in (1.34 N.m)		L100WDL2M8	A (see next page)	1.51 (0.68)
Snap-action CW 1 N.C. / 2 N.O. spring return	190 oz-in (1.34 N.m)		L100WTR2M10	A (see next page)	1.51 (0.68)
Snap-action CCW 1 N.O. / 2 N.C. spring return	190 oz-in (1.34 N.m)		L100WTR2M11	A (see next page)	1.51 (0.68)
Maintained contact ■ CW and CCW snap action 3 poles	45 oz-in (0.32 N.m)		L100WTR2M12	A (see next page)	1.51 (0.68)
Snap-action CCW 2 N.O. / 1 N.C. spring return	190 oz-in (1.34 N.m)		L100WTL2M13	A (see next page)	1.51 (0.68)
Snap-action CW 1 N.O. / 2 N.C. spring return	190 oz-in (1.34 N.m)		L100WTL2M14	A (see next page)	1.51 (0.68)
Maintained contact ■ CW and CCW snap action 3 poles	45 oz-in (0.32 N.m)		L100WTL2M15	A (see next page)	1.51 (0.68)
Neutral position ■ spring return slow make and break 1 N.O. contact per direction	95 oz-in (0.67 N.m)		L100WN2M16	B (see next page)	1.51 (0.68)
Neutral position ■ spring return slow make and break 1 N.O. contact for both directions	95 oz-in (0.67 N.m)		L100WN2M17	B (see next page)	1.51 (0.68)

Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches L100 Mill Switches

L100 Mill Switches

Description	Operating Torque	Contact Diagram	Catalog Number	Operating Data	Weight, lb (kg)
Neutral position ■ spring return slow make and break 1 N.C.-CW, 1 N.C.-CCW	95 oz-in (0.67 N.m)		L100WNC2M18	B (see table below)	1.51 (0.68)
Neutral position ■ spring return slow make and break 2 N.O.-CW, 1 N.O.-CCW	95 oz-in (0.67 N.m)		L100WTRN2M20	B (see table below)	1.51 (0.68)
Neutral position ■ spring return slow make and break N.O.-CW, 2 N.O.-CCW	95 oz-in (0.67 N.m)		L100WTLN2M21	B (see table below)	1.51 (0.68)
Slow make-before-break CW spring return	170 oz-in (1.2 N.m)		L100WS02M22	C (see table below)	1.51 (0.68)
Slow make-before-break CCW spring return	170 oz-in (1.2 N.m)		L100WS02M23	C (see table below)	1.51 (0.68)
Neutral position ■ N.O.-CW, N.O.-CCW spring return snap action	170 oz-in (1.2 N.m)		L100WS02M26	D (see table below)	1.51 (0.68)
Neutral position ■ N.O.-CW, N.O.-CCW maintained in CW only	170 oz-in (1.2 N.m)		L100WNSR2M28	D (see table below)	1.51 (0.68)
Neutral position ■ N.O.-CW, N.O.-CCW maintained in CW only	170 oz-in (1.2 N.m)		L100WNSR2M29	D (see table below)	1.51 (0.68)
Neutral position ■ N.C.-CW, N.C.-CCW spring return snap action	170 oz-in (1.2 N.m)		L100WNCS2M34	D (see table below)	1.51 (0.68)
Neutral position ■ N.O.-CW, N.O./N.C.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L100WTRN1C2M38	B (see table below)	1.51 (0.68)
Neutral position ■ N.O./N.C.-CW, N.O.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L100WTRN1C2M39	B (see table below)	1.51 (0.68)
Neutral position ■ N.O./N.C.-CW, N.C.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L100WTRN2C2M40	B (see table below)	1.51 (0.68)
Neutral position ■ N.C.-CW, N.O./N.C.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L100WTLN2M41	B (see table below)	1.51 (0.68)
Neutral position ■ N.O./N.C.-CW, N.C.-CCW spring return snap action	95 oz-in (0.67 N.m)		L100WTRN2CS2M48	D (see table below)	1.51 (0.68)

Operating Data for Contact Arrangements	A	B	C	D
Pre-travel	17° nominal	7° nominal	7° nominal	9° nominal
Differential travel	11° nominal	4° nominal	—	6° nominal
Overlapping travel	—	—	4° nominal	—
Total travel	80°	70°	80°	70°
Recommended installation travel	20°-35°	10°-25°	20°-35°	13°-30°
Repetitive accuracy of switch	± 0.03x	—	—	± 0.03x
Operating torque, max with return spring	190 oz-in (1.34 N.m)	95 oz-in (0.67 N.m)	170 oz-in (1.2 N.m)	170 oz-in (1.2 N.m)
Maintained contact	45 oz-in (0.317 N.m)	—	—	45 oz-in (0.317 N.m)

Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches L300 Foundry Switches

L300 Foundry Switches					
Description	Operating Torque	Contact Diagram	Catalog Number	Operating Data	Weight, lb (kg)
Snap-action CW spring return	190 oz-in (1.34 N.m)		L300WS2M1	A (see next page)	1.54 (0.70)
Snap-action CCW spring return	190 oz-in (1.34 N.m)		L300WS2M2	A (see next page)	1.54 (0.70)
Maintained contact ■ CW and CCW snap action	45 oz-in (0.32 N.m)		L300WS2M3	A (see next page)	1.54 (0.70)
Snap action CW spring return	190 oz-in (1.34 N.m)		L300WDR2M4	A (see next page)	1.54 (0.70)
Snap-action CCW spring return	190 oz-in (1.34 N.m)		L300WDR2M5	A (see next page)	1.54 (0.70)
Maintained contact ■ CW and CCW snap action	45 oz-in (0.32 N.m)		L300WDR2M6	A (see next page)	1.54 (0.70)
Snap action CCW spring return	190 oz-in (1.34 N.m)		L300WDL2M7	A (see next page)	1.54 (0.70)
Snap-action CW spring return	190 oz-in (1.34 N.m)		L300WDL2M8	A (see next page)	1.54 (0.70)
Snap-action CW 1 N.C. / 2 N.O. spring return	190 oz-in (1.34 N.m)		L300WTR2M10	A (see next page)	1.54 (0.70)
Snap-action CCW 1 N.O. / 2 N.C. spring return	190 oz-in (1.34 N.m)		L300WTR2M11	A (see next page)	1.54 (0.70)
Maintained contact ■ CW and CCW snap action 3 poles	45 oz-in (0.32 N.m)		L300WTR2M12	A (see next page)	1.54 (0.70)
Snap-action CCW 2 N.O. / 1 N.C. spring return	190 oz-in (1.34 N.m)		L300WTL2M13	A (see next page)	1.54 (0.70)
Snap-action CW 1 N.O. / 2 N.C. spring return	190 oz-in (1.34 N.m)		L300WTL2M14	A (see next page)	1.54 (0.70)
Maintained contact ■ CW and CCW snap action 3 poles	45 oz-in (0.32 N.m)		L300WTL2M15	A (see next page)	1.54 (0.70)
Neutral position ■ spring return slow make and break 1 N.O. contact per direction	95 oz-in (0.67 N.m)		L300WN2M16	B (see next page)	1.54 (0.70)
Neutral position ■ spring return slow make and break 1 N.O. contact for both directions	95 oz-in (0.67 N.m)		L300WN2M17	B (see next page)	1.54 (0.70)

Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches L300 Foundry Switches

L300 Foundry Switches

Description	Operating Torque	Contact Diagram	Catalog Number	Operating Data	Weight, lb (kg)
Neutral position ■ spring return slow make and break 1 N.C.-CW, 1 N.C.-CCW	95 oz-in (0.67 N.m)		L300WNC2M18	B (see table below)	1.54 (0.70)
Neutral position ■ spring return slow make and break 2 N.O.-CW, 1 N.O.-CCW	95 oz-in (0.67 N.m)		L300WTRN2M20	B (see table below)	1.54 (0.70)
Neutral position ■ spring return slow make and break N.O.-CW, 2 N.O.-CCW	95 oz-in (0.67 N.m)		L300WTLN2M21	B (see table below)	1.54 (0.70)
Slow make-before-break CW spring return	170 oz-in (1.2 N.m)		L300WS02M22	C (see table below)	1.54 (0.70)
Slow make-before-break CCW spring return	170 oz-in (1.2 N.m)		L300WS02M23	C (see table below)	1.54 (0.70)
Neutral position ■ N.O.-CW, N.O.-CCW spring return snap action	170 oz-in (1.2 N.m)		L300WS02M26	D (see table below)	1.54 (0.70)
Neutral position ■ N.O.-CW, N.O.-CCW maintained in CW only	170 oz-in (1.2 N.m)		L300WNSR2M28	D (see table below)	1.54 (0.70)
Neutral position ■ N.O.-CW, N.O.-CCW maintained in CW only	170 oz-in (1.2 N.m)		L300WNSR2M29	D (see table below)	1.54 (0.70)
Neutral position ■ N.C.-CW, N.C.-CCW spring return snap action	170 oz-in (1.2 N.m)		L300WNCS2M34	D (see table below)	1.54 (0.70)
Neutral position ■ N.O.-CW, N.O./N.C.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L300WTRN1C2M38	B (see table below)	1.54 (0.70)
Neutral position ■ N.O./N.C.-CW, N.O.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L300WTRN1C2M39	B (see table below)	1.54 (0.70)
Neutral position ■ N.O./N.C.-CW, N.C.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L300WTRN2C2M40	B (see table below)	1.54 (0.70)
Neutral position ■ N.C.-CW, N.O./N.C.-CCW spring return slow make and break	95 oz-in (0.67 N.m)		L300WTLN2M41	B (see table below)	1.54 (0.70)
Neutral position ■ N.O./N.C.-CW, N.C.-CCW spring return snap action	95 oz-in (0.67 N.m)		L300WTRN2CS2M48	D (see table below)	1.54 (0.70)

Operating Data for Contact Arrangements	A	B	C	D
Pre-travel	17° nominal	7° nominal	7° nominal	9° nominal
Differential travel	11° nominal	4° nominal	—	6° nominal
Overlapping travel	—	—	4° nominal	—
Total travel	80°	70°	80°	70°
Recommended installation travel	20°-35°	10°-25°	20°-35°	13°-30°
Repetitive accuracy of switch	± 0.03x	—	—	± 0.03
Operating torque, max with return spring	190 oz-in (1.34 N.m)	95 oz-in (0.67 N.m)	170 oz-in (1.2 N.m)	170 oz-in (1.2 N.m)
Maintained contact	45 oz-in (0.317 N.m)	—	—	45 oz-in (0.317 N.m)

Limit switches

R.B. Denison® Lox-Switch™ L Severe Duty Mill
and Foundry Switches
L140 and L2153 Cable Pulls



L140 Cable Pull



L2153 Dual Pull Stop

L140 Series Cable Pulls (1)

Circuit	Direction	Catalog Number	Weight lb (kg)
1 N.C.	CW right	L142	1.54 (0.70)
1 N.O. and 1 N.C.	CW right	L143	1.54 (0.70)
1 N.O. and 1 N.C.	CCW left	L144	1.54 (0.70)
1 N.C.	CCW left	L145	1.54 (0.70)
2 N.O. and 1 N.C.	CW right	L146	1.54 (0.70)
2 N.C. and 1 N.O.	CW right	L147	1.54 (0.70)
2 N.O. and 1 N.C.	CCW left	L148	1.54 (0.70)
2 N.C. and 1 N.O.	CCW left	L149	1.54 (0.70)

(1) Style K levers were designed specifically for this application; see page 619 (order separately).

(2) To complete the catalog number, refer to page 623 and add the suffix for the mounting plate style and the front cover material.

L2153 Dual Pull Stop

Description	Catalog Number	Weight lb (kg)
Dual pull cord switch — maintained contacts (stop and lever included)	L2153	2.04 (0.93)

Characteristics

Pre-travel	17° ± 2°
Differential travel	17° ± 2°
Overlapping travel	—
Total travel	80°
Recommended installation travel	—
Repetitive accuracy of switch	± 0.03x
Operating torque, max with return spring	13-27 lb-in (1,47-3.05 N•m)
Reset torque	7-19 lb-in (0,79-2.14 N•m)
Temperature range	-10 to +185 °F (-23 to +85 °C)
Maintained contact	—

Limit switches
R.B.Denison® Lox-Switch™ L Severe Duty Mill
and Foundry Switches
L525 Belt Conveyor Switches

L525				
Belt Conveyor Switches				
Description	Operating Torque	Contact Diagram	Catalog Number	Weight, lb (kg)
2 step sequence CW spring return, snap action, 2 N.O.	150 oz-in (1.06 N.m)		L525WDR2M56	1.5 (0.68)
2 step sequence CCW spring return, snap action, 2 N.O.	150 oz-in (1.06 N.m)		L525WDL2M57	1.5 (0.68)
2 step sequence CW spring return, snap action, 2 N.C.	150 oz-in (1.06 N.m)		L525WDL2M58	1.5 (0.68)
2 step sequence CCW spring return, snap action, 2 N.C.	150 oz-in (1.06 N.m)		L525WDR2M59	1.5 (0.68)
2 step sequence CW spring return, snap action, N.O./N.C. (1)	150 oz-in (1.06 N.m)		L100WS0S2M60	1.5 (0.68)

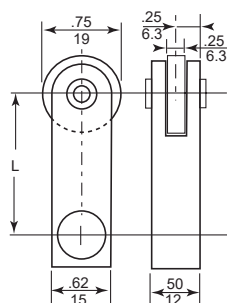
(1) Two step snap action. One normally closed, one normally open; CW operation to first step to 2-C. Further CW operation to second step, 1-O, 1-C. Spring return. Pretravel 9° nominal. Additional travel 8° nominal. Differential second step 7° nominal. Differential first step 7° nominal.

Characteristics	
Pre-travel	12° nominal
Additional travel	8° nominal
Differential travel	7x nominal
Total travel	75° nominal
Operating torque, max with return spring	150 oz-in nominal (1.06 N.m)

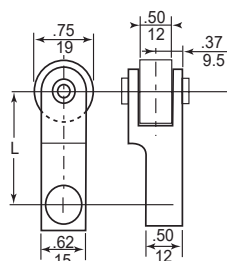
Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches L100/L300 Lever Arms

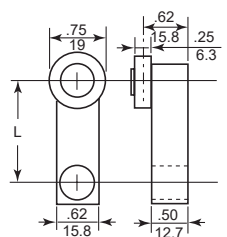
Dual dimensions: $\frac{\text{in.}}{\text{mm}}$



Style A



Style B



Style C

Lever arms are constructed of machined aluminum.

Style A Steel Roller

Arm	Steel Roller		Catalog Number	Weight
Length in. (mm)	Diameter in. (mm)	Width in. (mm)	Number (1)	lb (kg)
1.25 (31.7)	0.75 (19)	0.25 (6.3)	AC	0.06 (0.027)
1.50 (38.1)	1.0 (25.4)	0.25 (6.3)	AA	0.06 (0.027)
1.75 (44.4)	1.38 (35)	0.25 (6.3)	AD	0.07 (0.031)
2.00 (50.8)	0.75 (19)	0.25 (6.3)	AH	0.08 (0.036)
2.25 (57.1)	1.0 (25.4)	0.25 (6.3)	AJ	0.09 (0.041)
2.50 (63.5)	1.38 (35)	0.25 (6.3)	AO	0.10 (0.045)
2.75 (69.8)	0.75 (19)	0.25 (6.3)	AK	0.10 (0.045)
3.00 (76.2)	1.0 (25.4)	0.25 (6.3)	AB	0.11 (0.050)
3.50 (88.9)	1.38 (35)	0.25 (6.3)	AL	0.12 (0.054)
4.00 (101.6)	0.75 (19)	0.25 (6.3)	AM	0.13 (0.059)
4.50 (114.3)	0.75 (19)	0.25 (6.3)	AN	0.14 (0.064)
5.00 (127.0)	0.75 (19)	0.25 (6.3)	AP	0.16 (0.073)
5.50 (139.7)	1.0 (25.4)	0.25 (6.3)	AQ	0.18 (0.082)
6.00 (152.4)	1.38 (35)	0.25 (6.3)	AR	0.20 (0.091)

(1) Example: AC — This is the complete catalog number to order.

Style A Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
1.00 (25.4)	Roller	1
1.25 (32)	Roller	4
1.50 (38.1)	Roller	2
—	Nylon roller	N
0.75 (19)	Ball bearing roller	R
—	Stainless steel roller	NS

Style B Steel Roller

Arm	Steel Roller		Catalog Number	Weight
Length in. (mm)	Diameter in. (mm)	Width in. (mm)	Number	lb (kg)
1.50 (38.1)	0.75 (19)	0.50 (12.7)	BA	0.06 (0.027)
2.00 (50.8)	0.75 (19)	0.50 (12.7)	BH	0.08 (0.036)
2.50 (63.5)	0.75 (19)	0.50 (12.7)	BO	0.10 (0.045)
3.00 (76.2)	0.75 (19)	0.50 (12.7)	BB	0.12 (0.054)
4.00 (101.6)	0.75 (19)	0.50 (12.7)	BM	0.13 (0.059)
4.50 (114.3)	0.75 (19)	0.50 (12.7)	BN	0.14 (0.064)
5.50 (139.7)	0.75 (19)	0.50 (12.7)	BQ	0.18 (0.082)
6.00 (152.4)	0.75 (19)	0.50 (12.7)	BR	0.20 (0.091)

Style B Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
—	Nylon roller	N
1.5 (38.1)	Roller	2

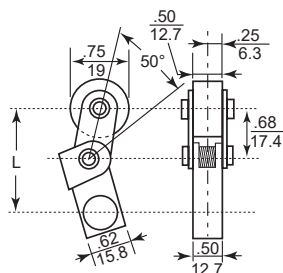
Style C Steel Roller On Side

Arm	Steel Roller		Catalog Number	Weight
Length in. (mm)	Diameter in. (mm)	Width in. (mm)	Number	lb (kg)
1.25 (31.7)	0.75 (19)	0.25 (6.3)	CC	0.06 (0.027)
1.50 (38.1)	0.75 (19)	0.25 (6.3)	CA	0.06 (0.027)
1.75 (44.4)	0.75 (19)	0.25 (6.3)	CD	0.07 (0.031)
2.00 (50.8)	0.75 (19)	0.25 (6.3)	CH	0.08 (0.036)
2.50 (63.5)	0.75 (19)	0.25 (6.3)	CO	0.10 (0.045)
3.00 (76.2)	0.75 (19)	0.25 (6.3)	CB	0.11 (0.050)
3.50 (88.9)	0.75 (19)	0.25 (6.3)	CL	0.12 (0.054)
4.00 (101.6)	0.75 (19)	0.25 (6.3)	CM	0.13 (0.059)
6.00 (152.4)	0.75 (19)	0.25 (6.3)	CR	0.20 (0.091)

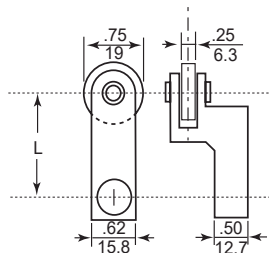
Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill
and Foundry Switches
L100/L300 Lever Arms

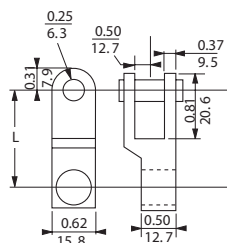
Dual dimensions: $\frac{\text{in.}}{\text{mm}}$



Style E



Style F



Style K

Style C Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
1.00 (25.4)	Roller	1
1.25 (32)	Roller	4
1.50 (38.1)	Roller	2
—	Nylon roller	N

Style E One Way Steel Roller

Arm	Steel Roller	Catalog Number	Weight lb (kg)
Length in. (mm)	Diameter in. (mm)	Width in. (mm)	
1.50 (38.1)	0.75 (19)	0.50 (12.7)	EA 0.30 (0.136)
1.75 (44.4)	0.75 (19)	0.50 (12.7)	ED 0.40 (0.181)
3.00 (76.2)	0.75 (19)	0.50 (12.7)	EB 0.50 (0.227)

Style E Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
—	Nylon roller	N

Style F Steel Roller

Arm	Steel Roller	Roller Position	Catalog Number	Weight lb (kg)
Length in. (mm)	Diameter in. (mm)	Offset	Width in. (mm)	
1.50 (38.1)	0.75 (19)	0.62 (15.8)	0.15 (3.8)	FB 0.06 (0.027)
1.50 (38.1)	0.75 (19)	0.87 (22.2)	0.15 (3.8)	FA 0.06 (0.027)
1.50 (38.1)	0.75 (19)	1.00 (25.4)	0.15 (3.8)	FC 0.06 (0.027)
2.00 (50.8)	0.75 (19)	1.00 (25.4)	0.15 (3.8)	FE 0.08 (0.036)
2.50 (63.5)	0.75 (19)	1.00 (25.4)	0.15 (3.8)	FG 0.10 (0.045)
3.00 (76.2)	0.75 (19)	0.62 (15.8)	0.15 (3.8)	FI 0.11 (0.050)
3.00 (76.2)	0.75 (19)	1.00 (25.4)	0.15 (3.8)	FJ 0.11 (0.050)

Style F Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
1.00 (25.4)	Roller	1
—	Nylon roller	N

Style K (for use with L140 cable pulls)

Arm	Steel Roller	Catalog Number	Weight lb (kg)
Length in. (mm)	Diameter in. (mm)	Description	
1.50 (38.1)	—	—	KA 0.05 (0.023)
2.50 (63.5)	—	—	KD 0.08 (0.036)
3.00 (76.2)	—	—	KB 0.09 (0.041)

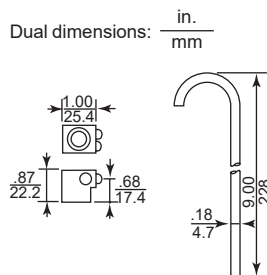
(1) Example: KA — This is the complete catalog number to order.

Style L (renewal parts for L2153 dual pull stop)

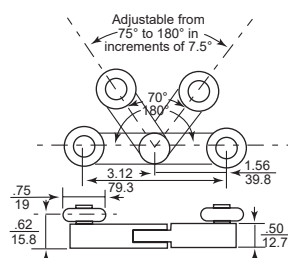
Description	Catalog Number	Weight lb (kg)
Lever	AL1746	0.25 (0.113)
Mechanical stop	AL1649	0.10 (0.045)

Limit switches

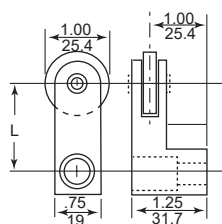
R.B.Denison® Lox-Switch™ L Severe Duty Mill
and Foundry Switches
Lever Arms



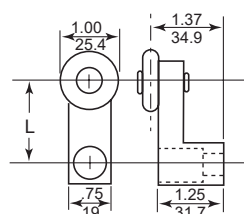
Style R



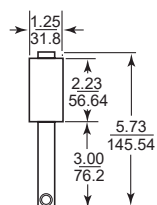
Style V



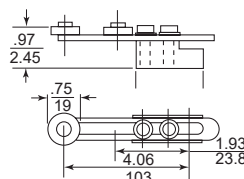
Style LA



Style LC



Rolling Pin



Adjustable Rolling Pin

Dimensions:
page 93

Style R Steel Rod

Description	Catalog Number	Weight lb (kg)
Hub only	R	0.10 (0.045)
Rod only	R9	0.09 (0.041)

Style V Yoke (for maintained position switches)

Description	Catalog Number	Weight lb (kg)
Yoke	VA	0.50 (0.227)

Style V Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
1.00 (24.5)	Roller	1
—	Nylon roller	N
0.75 (19)	Ball bearing roller	R

Style LA (to pass over switch cover)

Arm	Catalog Number	Weight lb (kg)
Length in. (mm)		
1.50 (38.1)	LAA1	0.12 (0.054)
2.00 (50.8)	LAH1	0.12 (0.054)
2.50 (63.5)	LA01	0.12 (0.054)

Style LA Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
1.50 (38.1)	Roller	2
—	Nylon roller	N

Style LC (to pass over switch cover)

Arm	Catalog Number (1)	Weight lb (kg)
Length in. (mm)		
1.50 (38.1)	LCA1	0.12 (0.054)
2.00 (50.8)	LCH1	0.12 (0.054)
2.50 (63.5)	LCO1	0.12 (0.054)

Style LC Options

Diameter in. (mm)	Description	Catalog Number — Add Suffix
1.25 (31.7)	Roller	4
1.50 (38.1)	Roller	2
—	Nylon roller	N

Rolling Pin (for use with 2 step switches for conveyor or belt applications)

Arm	Catalog Number (1)	Weight lb (kg)
Length in. (mm)		
2.25 (57.1)	AL1650	0.30 (0.136)
2.25 (57.1)	AL16501	0.33 (0.150)
3.00 (76.2)	AL1802	0.33 (0.150)

Rolling Pin (adjustable)

Arm	Steel Roller	Catalog Number	Weight lb (kg)
Length in. (mm)	Diameter in. (mm)	Width in. (mm)	
2.00 (50.8) to 4.00 (101.6)	0.75 (19)	0.25 (6.3)	AL1650 0.30 (0.136)

Note: No hub component is needed for Type AL rolling pins. The arm mounts directly onto the shaft of the switch.

Limit switches

R.B. Denison® Lox-Switch™ L Severe Duty Mill
and Foundry Switches

L100/L300 Options and Accessories



Housing Options (1)

Description	Example Full Catalog Number	Catalog Number Add Prefix	Weight lb (kg)
0.75 in. conduit opening Available on 2 circuit switches Standard on 3 circuit switches	L100WS2M1 changes to GL100WS2M1	G	1.54 (0.70)
High temperature 0 to +350 °F (-17.7 to +176.6 °C) (4) Metal front cover only	L100WS2M1 changes to HL100WS2M1	H	1.54 (0.70)
Low temperature -20 to 200 °F (-28.8 to +93.3 °C) (4)	L100WS2M1 changes to TL100WS2M1	T	1.54 (0.70)
High shock Available only on operating sequences 1, 2, 4, 5, 7-11, 13, 14	L100WS2M1 changes to L526WS2M1 L300WS2M1 changes to L326WS2M1	526 326	1.54 (0.70)
Gold contacts	L100WS2M1 changes to L522WS2M1 L300WS2M1 changes to L322WS2M1	522 322	1.54 (0.70)
Metric conduit threads M20 (20 mm)	L100WS2M1 changes to ML100WS2M1	M	1.54 (0.70)

Wiring

Description	Example Full Catalog Number	Catalog Number Add Prefix	Weight lb (kg)
Straight male receptacle 4-pin (2) Factory prewired	L100WS2M1 changes to PL100WS2M1	P	1.54 (0.70)
90° Angle male receptacle 4-pin (2) Factory prewired – facing right	L100WS2M1 changes to APL100WS2M1	AP	1.54 (0.70)
Ministyle male receptacle (3) 8 A max. 5-pin (double circuit) or 7 A max. 7-pin (triple circuit)	L100WS2M1 changes to BL100WS2M1	B	1.54 (0.70)
Potted and prewired	Example Full Catalog Number	Add Suffix	Weight lb (kg)
5 wires 6 ft (1.8 mm) long	L100WS2M1 changes to L100WS2M1P	P	1.54 (0.70)
5 wires 12 ft (3.6 mm) long	L100WS2M1 changes to L100WS2M1P12	P12	1.54 (0.70)
5 wires 18 ft (5.5 mm) long	L100WS2M1 changes to L100WS2M1P18	P18	1.54 (0.70)

Front Covers

Description	Example Full Catalog Number	Catalog Number Add Suffix	Weight lb (kg)
Standard metal		M	–
Transparent plastic cover with metal frame		PF	–
Transparent plastic cover with metal frame and Neon indicator light (not connected)		GF	–
	L100WS2M1 changes to L100WS2PF1		1.54 (0.70)

Accessories

Description	Catalog Number	Weight lb (kg)
Sealed female plug and cable for P and AP connector		
4 pin, #16 AWG STO cable 140 °F (60 °C)	4 ft. (1.21 m)	1010004 1.20 (0.54)
	6 ft. (1.82 m)	1010006 1.25 (0.57)
	10 ft. (3.04 m)	10100010 1.50 (0.68)
Sealed female plug and cable for ministyle connector (B)		
5 pin, #16 AWG STO cable 221 °F (105 °C)	3 ft. (0.91 m)	BH2053 1.50 (0.68)
	6 ft. (1.82 m)	BH2056 1.70 (0.77)
	12 ft. (3.65 m)	BH20512 2.10 (0.95)

(1) Other options available – contact your local field office for details.

(2) Receptacle is a 4-pin male APL/PL-SWTS, Cannon part # MS3102E20-4P-F79 or equal.

(3) Ministyle male connectors are:
- 5-pin: Brad Harrison #41310 (or equal)
- 7-pin: Brad Harrison #42805 (or equal)

(4) The minimum temperatures listed are based on the absence of freezing moisture or water.

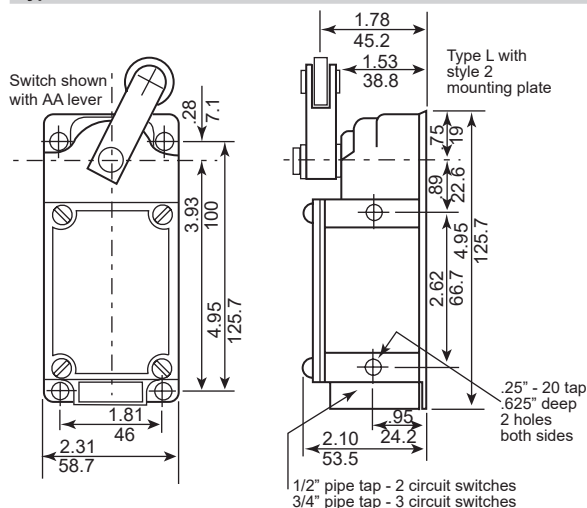
Limit switches

R.B.Denison® Lox-Switch™ L Severe Duty Mill and Foundry Switches L100/L300 Options and Accessories

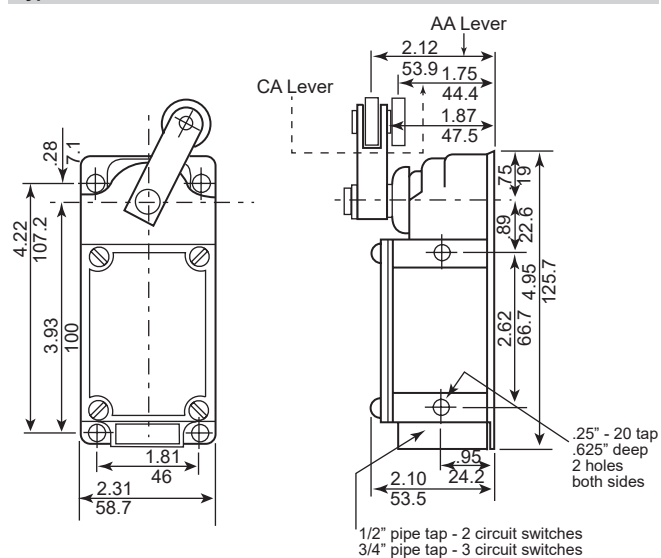
Dimensions

Switches

Type L100

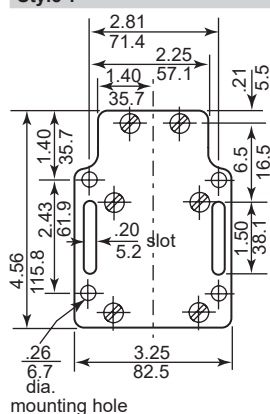


Type L300

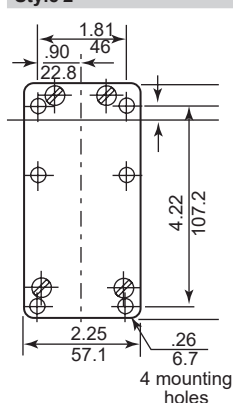


Base Plates

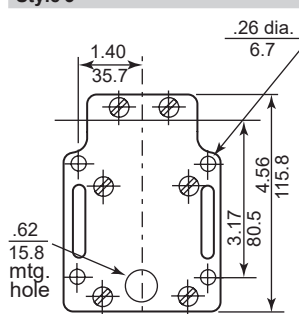
Style 1



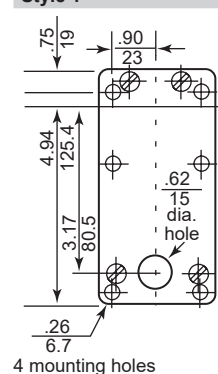
Style 2



Style 3

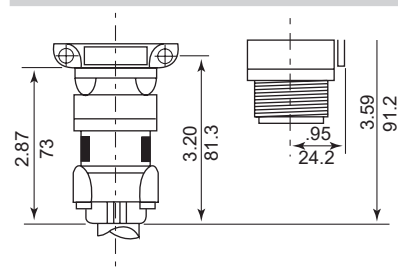


Style 4

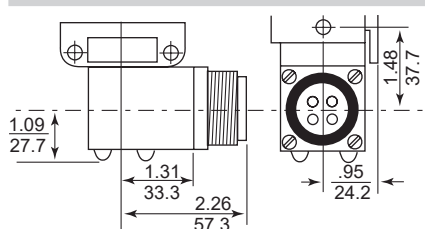


Receptacles

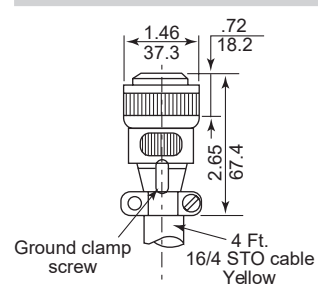
PL



APL



101000

Dual dimensions: $\frac{\text{in.}}{\text{mm}}$

Limit switches

R.B. Denison® Lox-Switch™ L Severe Duty Mill
and Foundry Switches

L100, L300 Mill and Foundry Switches

Interpretation of Catalog Numbers

The interpretation of catalog numbers is intended to help you understand how the catalog number is laid out. It is to be used with existing numbers only. The table below should not be used to generate new catalog numbers. If the contact sequence required is not listed, contact your local field office.

L100 and L300

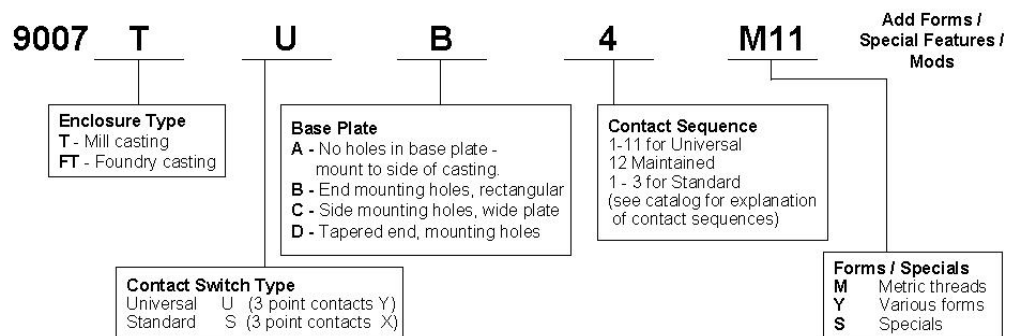


Style	Housing			Function		Mounting Plate	Front Cover		Contact Arrangement	
L	1	0	0	W	S	2	P	F		
1 to 60										
Mill	100	L14* and L2153 pull cord switches			Style 1	1	M	Standard metal		
Foundry	300				Style 2	2	PF	Transparent plastic		
Belt Conveyor	525				Style 3	3	GF	Transparent plastic with neon light		
Two circuit single operation				WS	Style 4	4				
Two circuit dual operation				WD						
Triple circuit				WT						
Neutral				WN						

The only modifications to the existing catalog numbers are:

- Base Plates: Select style 1, 2, 3 or 4
- Front Covers: Select metal, transparent plastic, or transparent plastic with neon light.

9007T and FT



Limit switches

Class 9007 Switches

Others Part Numbers		9007AA1	43	9007BT1	34	9007C62B2M11	30	9007CA5M	48
10100010	92	9007AA17	43	9007BT3	34	9007C62B2P6	29	9007CA6	44
1010004	92	9007AA18M	48	9007C1	75	9007C62B2Y19016	31	9007CA8	43
1010006	92	9007AA1M	48	9007C2	75	9007C62C	23	9007CA8M	48
2358C22G3	42	9007AA1S	45	9007C3	75	9007C62D	22	9007CA9	44
2358C22G6	42	9007AA2	43	9007C	42	9007C62DM11	30	9007CA9M	48
2358C22G8	42	9007AA2S	45	9007C52A2	27	9007C62DP6	29	9007CO52	41
2358C6G2	42	9007AA5	44	9007C52B2	27	9007C62DY19016	31	9007CO54	41
2358C6G3	42	9007AA5M	48	9007C52C	27	9007C62E	22	9007CO62	41
2358C6G6	42	9007AA6	44	9007C52D	26	9007C62ED	22	9007CO66	41
2358C6G8	42	9007AA8	43	9007C52E	26	9007C62EM11	30	9007CO68	41
2934D14G1	76	9007AA8M	48	9007C52ED	26	9007C62EP6	29	9007CR53A2	55
2934D32G1	76	9007AA9	44	9007C52F	25	9007C62EY19016	31	9007CR53B2	55
2934D33G1	76	9007AA9M	48	9007C52G	25	9007C62F	21	9007CR53C	55
2934D34G1	76	9007AF12	18	9007C52GD	25	9007C62FM11	30	9007CR53D	54
31032-488-01	34	9007AO12	18	9007C52H	25	9007C62FP6	29	9007CR53E	54
31032-815-01	34	9007AO16	18	9007C52J	28	9007C62FY19016	31	9007CR53ED	54
7A1	15	9007AO18	18	9007C52JKC	28	9007C62FY1912	31	9007CR53F	53
7A1N	15	9007AO36	18	9007C52K	28	9007C62G	21	9007CR53G	53
7A2	15	9007AW12	18	9007C52KC	28	9007C62GD	21	9007CR53GD	53
7A2N	15	9007AW14	18	9007C52L	28	9007C62H	21	9007CR53H	53
7A3N	15	9007AW16	18	9007C52N2	27	9007C62J	24	9007CR53J	56
7A4N	15	9007AW18	18	9007C52R	26	9007C62JKC	24	9007CR53JKC	56
7A7N	15	9007AW19	18	9007C54A2	23	9007C62JM11	30	9007CR53K	56
7B1N	15	9007AW32	18	9007C54B2	23	9007C62JP6	29	9007CR53KC	56
7B2	15	9007AW36	18	9007C54B2M11	30	9007C62JY19016	31	9007CR53L	56
7B2N	15	9007AW38	18	9007C54B2P6	29	9007C62K	24	9007CR53N2	55
7B3N	15	9007AW42	18	9007C54B2Y1901	31	9007C62KC	24	9007CR53R	54
7B4N	15	9007AW46	18	9007C54B2Y19019	31	9007C62L	24	9007CR61A2	55
7B7N	15	9007B12	75	9007C54B2Y1912	31	9007C62LM11	30	9007CR61B2	55
7D	15	9007B13	75	9007C54C	23	9007C62LP6	29	9007CR61C	55
7DN	15	9007B14	75	9007C54D	22	9007C62LY19016	31	9007CR61D	54
7F1N	15	9007B16	76	9007C54DM11	30	9007C62N2	23	9007CR61E	54
7F2N	15	9007B1	75	9007C54DP6	29	9007C62R	22	9007CR61ED	54
7F3N	15	9007B19	75	9007C54DY1901	31	9007C66A2	23	9007CR61F	53
7F4N	15	9007B21	75	9007C54DY19019	31	9007C66B2	23	9007CR61G	53
7F7N	15	9007B22	75	9007C54DY1912	31	9007C66D	22	9007CR61GD	53
7J1N	15	9007B23	75	9007C54E	22	9007C66E	22	9007CR61H	53
7J2N	15	9007B24	75	9007C54ED	22	9007C66ED	22	9007CR61J	56
7J3N	15	9007B2	75	9007C54EM11	30	9007C66F	21	9007CR61JKC	56
7J4N	15	9007B27	76	9007C54EP6	29	9007C66G	21	9007CR61K	56
7J7N	15	9007B3	75	9007C54EY1901	31	9007C66GD	21	9007CR61KC	56
7N	15	9007B	42	9007C54EY19019	31	9007C66J	24	9007CR61L	56
7S	15	9007B7	75	9007C54EY1912	31	9007C66JKC	24	9007CR61N2	55
7XA1	15	9007B8	75	9007C54F	21	9007C66K	24	9007CR61R	54
7XA1N	15	9007B9	75	9007C54FM11	30	9007C66KC	24	9007CR65A2	55
7XA2	15	9007BA0S	45	9007C54FP6	29	9007C66L	24	9007CR65B2	55
7XA2N	15	9007BA11	43	9007C54FY1901	31	9007C66N2	23	9007CR65D	54
7XA3N	15	9007BA11M	48	9007C54FY19019	31	9007C66R	22	9007CR65E	54
7XA4N	15	9007BA12	43	9007C54G	21	9007C68T10	23	9007CR65ED	54
7XA7N	15	9007BA13	43	9007C54GD	21	9007C68T5	23	9007CR65F	53
7XB1N	15	9007BA1	43	9007C54H	21	9007CA0S	45	9007CR65G	53
7XB2	15	9007BA15	44	9007C54J	24	9007CA11	43	9007CR65GD	53
7XB2N	15	9007BA17	43	9007C54JKC	24	9007CA11M	48	9007CR65J	56
7XB3N	15	9007BA18	43	9007C54JM11	30	9007CA12	43	9007CR65JKC	56
7XB4N	15	9007BA18M	48	9007C54JP6	29	9007CA13	43	9007CR65K	56
7XB7N	15	9007BA1M	48	9007C54JY1901	31	9007CA1	43	9007CR65KC	56
7XF1N	15	9007BA1S	45	9007C54JY19019	31	9007CA15	44	9007CR65L	56
7XF2N	15	9007BA2	43	9007C54JY1912	31	9007CA17	43	9007CR65N2	55
7XF3N	15	9007BA2S	45	9007C54K	24	9007CA18	43	9007CR65R	54
7XF4N	15	9007BA3	46	9007C54KC	24	9007CA18M	48	9007CR67T10	55
7XF7N	15	9007BA3S	46	9007C54L	24	9007CA1M	48	9007CR67T5	55
7XJ1N	15	9007BA4	43	9007C54LM11	30	9007CA1S	45	9007CT10	34
7XJ2N	15	9007BA4S	45	9007C54LP6	29	9007CA2	43	9007CT11	34
7XJ3N	15	9007BA5	44	9007C54LY1901	31	9007CA2S	45	9007CT12	34
7XJ4N	15	9007BA5M	48	9007C54LY19019	31	9007CA31	44	9007CT13	34
7XJ7N	15	9007BA6	44	9007C54LY1912	31	9007CA3	46	9007CT52	41
9007A	42	9007BA8	43	9007C54N2	23	9007CA3S	46	9007CT54	41
9007AA0S	45	9007BA8M	48	9007C54R	22	9007CA4	43	9007CT62	41
9007AA11M	48	9007BA9	44	9007C62A2	23	9007CA4S	45	9007D1	75
		9007BA9M	48	9007C62B2	23	9007CA5	44	9007D2	75

Limit switches

Class 9007 Switches

9007D3	75	9007FTSB2	74	9007HA5	47	9007MS02G0100	14	9007TUC12	70
9007D	42	9007FTSB3	74	9007HA6	47	9007MS02S0100	14	9007TUC1	69
9007D4	76	9007FTSC1	74	9007HA8	47	9007MS03G0100	14	9007TUC2	69
9007DA0S	45	9007FTSC2	74	9007HA9	47	9007MS03S0100	14	9007TUC3	69
9007DA11	43	9007FTSC3	74	9007J1	75	9007MS04G0100	14	9007TUC4	69
9007DA11M	48	9007FTSD1	74	9007J2	75	9007MS04S0100	14	9007TUC5	69
9007DA12	43	9007FTSD2	74	9007J	42	9007MS05G0100	14	9007TUC6	69
9007DA13	43	9007FTSD3	74	9007JKC	42	9007MS05S0100	14	9007TUC7	70
9007DA1	43	9007FTUA10	73	9007K1	75	9007MS06G0100	14	9007TUC8	70
9007DA15	44	9007FTUA11	73	9007K2	75	9007MS06S0100	14	9007TUC9	70
9007DA17	43	9007FTUA12	73	9007K	42	9007MS07G0100	14	9007TUD10	70
9007DA18	43	9007FTUA1	72	9007KA11	46	9007MS07S0100	14	9007TUD11	70
9007DA18M	48	9007FTUA2	72	9007KA12	46	9007MS08G0100	14	9007TUD12	70
9007DA1M	48	9007FTUA3	72	9007KA1	46	9007MS08S0100	14	9007TUD1	69
9007DA1S	45	9007FTUA4	72	9007KA18	46	9007MS09G0100	14	9007TUD2	69
9007DA2S	45	9007FTUA5	72	9007KA21	46	9007MS09S0100	14	9007TUD3	69
9007DA31	44	9007FTUA6	72	9007KA2	46	9007N1	75	9007TUD4	69
9007DA3	46	9007FTUA7	73	9007KA9	46	9007N2	75	9007TUD5	69
9007DA3S	46	9007FTUA8	73	9007KB11	46	9007N	42	9007TUD6	69
9007DA4	43	9007FTUA9	73	9007KB15	46	9007R16	76	9007TUD7	70
9007DA4S	45	9007FTUB10	73	9007KC	42	9007R17	76	9007TUD8	70
9007DA5	44	9007FTUB11	73	9007L	42	9007R18	75	9007TUD9	70
9007DA5M	48	9007FTUB12	73	9007LA10	45	9007R19	75	9007WJ	42
9007DA6	44	9007FTUB1	72	9007LA11	45	9007R20	75	9007WK	42
9007DA8	43	9007FTUB2	72	9007LA12	45	9007R21	76	9007WKC	42
9007DA8M	48	9007FTUB3	72	9007LA1	45	9007R22	76	9007X1	75
9007DA9	44	9007FTUB4	72	9007LA16	45	9007R	42	9007X2	75
9007DA9M	48	9007FTUB5	72	9007LA17	45	9007RA11	46	9007Y1	75
9007E	42	9007FTUB6	72	9007LA18	45	9007RA18	46	9007Y2	75
9007E4	75	9007FTUB7	73	9007LA19	47	9007RA9	46	9007Y3	76
9007E5	75	9007FTUB8	73	9007LA2	45	9007S9	34	9007Z1	75
9007E6	75	9007FTUB9	73	9007LA3	45	9007T10	42	9007Z2	75
9007EA0S	45	9007FTUC10	73	9007LA4	45	9007T5	42		
9007EA11	43	9007FTUC11	73	9007LA5	45	9007TSA1	71	A	
9007EA11M	48	9007FTUC12	73	9007LA6	45	9007TSA2	71	AA	89
9007EA12	43	9007FTUC1	72	9007LA7	45	9007TSA3	71	AB	89
9007EA13	43	9007FTUC2	72	9007LA8	45	9007TSB1	71	AC	89
9007EA1	43	9007FTUC3	72	9007LA9	45	9007TSB2	71	AD	89
9007EA15	44	9007FTUC4	72	9007MA11	43	9007TSB3	71	AH	89
9007EA17	43	9007FTUC5	72	9007MA11M	48	9007TSC1	71	AJ	89
9007EA18	43	9007FTUC6	72	9007MA12	43	9007TSC2	71	AK	89
9007EA18M	48	9007FTUC7	73	9007MA13	43	9007TSC3	71	AL1649	90
9007EA1M	48	9007FTUC8	73	9007MA1	43	9007TSD1	71	AL16501	91
9007EA1S	45	9007FTUC9	73	9007MA15	44	9007TSD2	71	AL1650	91
9007EA2	43	9007FTUD10	73	9007MA17	43	9007TSD3	71	AL1746	90
9007EA2S	45	9007FTUD11	73	9007MA18	43	9007TUA10	70	AL1802	91
9007EA3	46	9007FTUD12	73	9007MA18M	48	9007TUA11	70	AL	89
9007EA3S	46	9007FTUD1	72	9007MA18S	45	9007TUA12	70	AM	89
9007EA4	43	9007FTUD2	72	9007MA1M	48	9007TUA1	69	AN	89
9007EA4S	45	9007FTUD3	72	9007MA22	44	9007TUA2	69	AO	89
9007EA5	44	9007FTUD4	72	9007MA2	43	9007TUA3	69	AP	89
9007EA5M	48	9007FTUD5	72	9007MA31	44	9007TUA4	69	APL100WS2M1	92
9007EA6	44	9007FTUD6	72	9007MA3	46	9007TUA5	69	AQ	89
9007EA8	43	9007FTUD7	73	9007MA4	43	9007TUA6	69	AR	89
9007EA8M	48	9007FTUD8	73	9007MA5	44	9007TUA7	70		
9007EA9	44	9007FTUD9	73	9007MA5M	48	9007TUA8	70	B	
9007EA9M	48	9007G10	76	9007MA6	44	9007TUA9	70	BA	89
9007ED	42	9007G	42	9007MA8	43	9007TUB10	70	BB	89
9007F	42	9007GD	42	9007MA8M	48	9007TUB11	70	BH20512	34, 92
9007F4	75	9007H	42	9007MA9	44	9007TUB12	70	BH2053	34, 92
9007F5	75	9007HA0	47	9007MA9M	48	9007TUB1	69	BH2056	34, 92
9007F6	75	9007HA1	47	9007ML01S0100	14	9007TUB2	69	BH	89
9007FA1	47	9007HA20	47	9007ML02S0100	14	9007TUB3	69	BL100WS2M1	92
9007FA2	46	9007HA21	47	9007ML03S0100	14	9007TUB4	69	BM	89
9007FA3	47	9007HA22	47	9007ML04S0100	14	9007TUB5	69	BN	89
9007FA5	47	9007HA23	47	9007ML06S0100	14	9007TUB6	69	BO	89
9007FA6	47	9007HA24	47	9007ML07S0100	14	9007TUB7	70	BQ	89
9007FTSA1	74	9007HA2	47	9007ML08S0100	14	9007TUB8	70	BR	89
9007FTSA2	74	9007HA25	47	9007ML09S0100	14	9007TUB9	70		
9007FTSA3	74	9007HA26	47	9007MS01G0100	14	9007TUC10	70	C	
9007FTSB1	74	9007HA4	47	9007MS01S0100	14	9007TUC11	70	CA	89

CB	89	L142	87
CC	89	L143	87
CD	89	L144	87
CH	89	L145	87
CL	89	L146	87
CM	89	L147	87
CO	89	L148	87
CR	89	L149	87
		L2153	87
E		L300WDL2M7	85
EA	90	L300WDL2M8	85
EB	90	L300WDR2M4	85
ED	90	L300WDR2M5	85
		L300WDR2M6	85
F		L300WN2M16	85
FA	90	L300WN2M17	85
FB	90	L300WNC2M18	86
FC	90	L300WNC2M34	86
FE	90	L300WNSR2M28	86
FG	90	L300WNSR2M29	86
FI	90	L300WS02M22	86
FJ	90	L300WS02M23	86
		L300WS02M26	86
G		L300WS2M1	85
GL100WS2M1	92	L300WS2M2	85
		L300WS2M3	85
H		L300WTL2M13	85
HL100WS2M1	92	L300WTL2M14	85
		L300WTL2M15	85
K		L300WTLN2M21	86
KA	90	L300WTLN2M41	86
KB	90	L300WTR2M10	85
KD	90	L300WTR2M11	85
		L300WTR2M12	85
L		L300WTRN1C2M38	86
L100WDL2M7	83	L300WTRN1C2M39	86
L100WDL2M8	83	L300WTRN2C2M40	86
L100WDR2M4	83	L300WTRN2CS2M48	86
L100WDR2M5	83	L300WTRN2M20	86
L100WDR2M6	83	L322WS2M1	92
L100WN2M16	83	L326WS2M1	92
L100WN2M17	83	L522WS2M1	92
L100WNC2M18	84	L525WDL2M57	88
L100WNC2M34	84	L525WDL2M58	88
L100WNSR2M28	84	L525WDR2M56	88
L100WNSR2M29	84	L525WDR2M59	88
L100WS02M22	84	L526WS2M1	92
L100WS02M23	84	LA01	91
L100WS02M26	84	LAA1	91
L100WS02M60	88	LAH1	91
L100WS2M1	83	LCA1	91
L100WS2M1P12	92	LCH1	91
L100WS2M1P18	92	LCO1	91
L100WS2M1P	92		
L100WS2M2	83		
L100WS2M3	83		
L100WS2PF1	92		
L100WTL2M13	83		
L100WTL2M14	83		
L100WTL2M15	83		
L100WTLN2M21	84		
L100WTLN2M41	84		
L100WTR2M10	83		
L100WTR2M11	83		
L100WTR2M12	83		
L100WTRN1C2M38	84		
L100WTRN1C2M39	84		
L100WTRN2C2M40	84		
L100WTRN2CS2M48	84		
L100WTRN2M20	84		

Limit switches

Class 9007 Switches

[illegible]

Limit switches

Class 9007 Switches

[illegible]

www.telemecaniquesensors.com

The information provided in this catalogue contains description of products sold by TMSS France, its subsidiaries and other affiliated companies ('Offer') with technical specifications and technical characteristics of the performance of the corresponding Offer.

The content of this document is subject to revision at any time without notice due to continued progress in methodology, design and manufacturing.

To the extent permitted by applicable law, no responsibility or liability is assumed by TMSS France, its subsidiaries and other affiliated companies for any type of damage arising out of or in connexion with (a) informational content of this catalogue not conforming with or exceeding the technical specifications, or (b) any error contained in this catalogue, or (c) any use, decision, act or omission made or taken on the basis of or in reliance on any information contained or referred to in this catalogue.

NEITHER TMSS FRANCE, ITS SUBSIDIARIES, NOR ITS OTHER AFFILIATES, AS THE CASE MAYBE, MAKE NO WARRANTY OR REPRESENTATION OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO WHETHER THIS CATALOGUE OR ANY INFORMATION CONTAINED THEREIN SUCH AS PRODUCTS WILL MEET REQUIREMENTS, EXPECTATIONS OR PURPOSE OF ANY PERSON MAKING USE THEREOF.

Telemecanique™ Sensors is a trademark of Schneider Electric Industries SAS used under license by TMSS France. Any other brands or trademarks referred to in this catalogue are property of TMSS France or, as the case may be, of its subsidiaries or other affiliated companies. All other brands are trademarks of their respective owners.

This catalogue and its content are protected under applicable copyright laws and provided for informative use only.

No part of this catalogue may be reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), for any purpose, without the prior written permission of TMSS France. Copyright, intellectual, and all other proprietary rights in the content of this catalogue (including but not limited to audio, video, text, and photographs) rests with TMSS France, its subsidiaries, and other affiliated companies or its licensors. All rights in such content not expressly granted herein are reserved. No rights of any kind are licensed or assigned or shall otherwise pass to persons accessing this information.

As standards, specifications and design change from time to time, please ask for confirmation of the information given in this publication.

©2024, TMSS France, All Rights Reserved.

TMSS France SAS
Share capital: 366 931 214 €
Tour Egho, 2 avenue Gambetta
92400 Courbevoie – France
908 125 255 RCS Nanterre

TES ELECTRIC US, LLC
1875 Founders Drive
Kettering, Ohio 45420-4017
United States of America