

Enclosed Limit Switches

ZE/ZV/ZV2

Large Switching Capacity and Long Service Life

- 15-amp, 125 VAC switching capacity
- Wide selection of actuators
- Rugged diecast housing
- Sealed (booted) switches meet NEMA types 1, 2, 3, 4 and 5
- Three mounting styles available:
 - Side mounting (ZE)
 - Diagonal side mounting (ZV2) is ideal for gang mounting several switches
 - Flanged base mounting (ZV)



Ordering Information

■ SIDE-MOUNTING SWITCHES

Actuators	General-purpose	Sealed (booted)
Plunger	ZE-Q-2S	ZE-N-2S
Roller plunger	ZE-Q22-2S	ZE-N22-2S
Cross roller plunger	ZE-Q21-2S	ZE-N21-2S
Roller arm lever	ZE-QA2-2S	ZE-NA2-2S
One-way action arm lever	ZE-QA277-2S	ZE-NA277-2S
Rod lever	ZE-QCL-2S	ZE-NCL-2S
Coil spring	—	ZE-NJ-2S

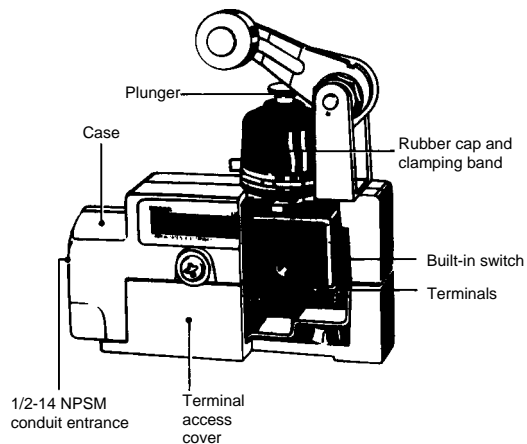
■ DIAGONAL SIDE-MOUNTING SWITCHES

Actuators	General-purpose	Sealed (booted)
Plunger	ZV2-Q-2S	ZV2-N-2S
Roller plunger	ZV2-Q22-2S	ZV2-N22-2S
Cross roller plunger	ZV2-Q21-2S	ZV2-N21-2S
Roller arm lever	ZV2-QA2-2S	ZV2-NA2-2S
One-way action arm lever	ZV2-QA277-2S	ZV2-NA277-2S
Rod lever	ZV2-QCL-2S	ZV2-NCL-2S
Coil spring	—	ZV2-NJ-2S

■ FLANGED BASE-MOUNTING SWITCHES

Actuators	General-purpose	Sealed (booted)
Plunger	ZV-Q-2S	ZV-N-2S
Roller plunger	ZV-Q22-2S	—
Cross roller plunger	ZV-Q21-2S	—
Roller arm lever	ZV-QA2-2S	ZV-NA2-2S
One-way action arm lever	ZV-QA277-2S	ZV-NA277-2S
Rod lever	ZV-QCL-2S	ZV-NCL-2S
Coil spring	—	ZV-NJ-2S

Construction



Specifications

■ RATINGS

Maximum Carrying Currents

Rated voltage	Non-inductive load (amps)				Inductive load (amps)				Inrush current (amps)	
	Resistive load		Lamp load		Inductive load		Motor load		NC	NO
	NC	NO	NC	NO	NC	NO	NC	NO		
125 VAC	15	15	3	1.5	15	15	5	2.5	30 max.	15 max.
250 VAC	15	15	2.5	1.25	15	15	3	1.5		
480 VAC	10	10	1.5	0.75	6	6	1.5	0.75		
125 VDC	0.5	0.5	0.5	0.5	0.05	0.05	0.05	0.05		
250 VDC	0.25	0.25	0.25	0.25	0.03	0.03	0.03	0.03		

Note:

1. Inductive load has a power factor of 0.4 minimum (AC) and a time constant of 7 msec (DC).
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

■ CHARACTERISTICS

Enclosure rating	UL	Types 3, 4, and 13
	NEMA	Types 1, 2, 3, 4, 5 for "-N types"; Type 1 for "-Q" types; Type 13 for ZV2-Q models
	IEC 144	IP65 for "-N types"; IP50 for "-Q types"
Mechanical life		10 million operations min.; 100,000 operations min. for ZE-NRN-S and ZV-NRN-S
Ambient operating temperature		-10° to 80°C (14° to 176°F)
Vibration	Malfunction durability	10 to 55 Hz, 1.5 mm (0.06 in) double amplitude
Shock	Malfunction durability	20 G
	Mechanical durability	100 G

■ OPERATING CHARACTERISTICS

Legend: OF = Operating Force (max.); RF = Reset Force (min.); OT = Overtravel (min.); PT = Pretravel;

MD = Movement Differential (max.); OP = Operating Position

ZE-Q General Purpose and ZE-N Sealed, Side Mounting Switches

Part number	Description	OF	RF	OT	PT	MD	OP
ZE-Q-2S	Pin plunger	250 to 350 g (8.8 to 12.3 oz.)	114 g (4.0 oz.)	5.5 mm (0.217 in)	0.4 mm (0.016 in)	0.05 mm (0.002 in)	38.2 ±0.8 mm (1.50 ±0.03 in)
ZE-Q22-2S	Roller plunger	250 to 350 g (8.8 to 12.3 oz.)	114 g (4.0 oz.)	3.6 mm (0.142 in)	0.5 mm (0.020 in)	0.05 mm (0.002 in)	49.7 ±1 mm (1.96 ±0.04 in)
ZE-Q21-2S	Cross roller plunger	250 to 350 g (9.8 to 12.3 oz.)	114 g (4.0 oz.)	3.6 mm (0.142 in)	0.5 mm (0.020 in)	0.05 mm (0.002 in)	49.7 ±1 mm (1.96 ±0.04 in)
ZE-QA2-2S	Roller arm lever	570 g (20.1 oz.)	170 g (6.0 oz.)	6 mm (0.236 in)	4 mm (0.157 in)	0.4 mm (0.016 in)	—
ZE-QA277-2S	One-way action arm lever	570 g (20.1 oz.)	170 g (6.0 oz.)	6 mm (0.236 in)	4 mm (0.157 in)	0.4 mm (0.016 in)	—
ZE-QCL-2S	Rod lever	153 g (5.4 oz.)	45 g (1.6 oz.)	22 mm (0.866 in)	15 mm (0.591 in)	1.5 mm (0.059 in)	—
ZE-N-2S	Sealed pin plunger	800 g (28.2 oz.)	240 g (8.5 oz.)	5 mm (0.197 in)	2 mm (0.079 in)	0.1 mm (0.004 in)	45.8 ±0.8 mm (1.80 ±0.03 in)
ZE-N22-2S	Sealed roller plunger	500 g (17.6 oz.)	100 g (3.5 oz.)	3.5 mm (0.138 in)	1 mm (0.039 in)	0.12 mm (0.005 in)	49.7 ±0.8 mm (1.96 ±0.03 in)
ZE-N21-2S	Sealed cross roller plunger	500 g (17.6 oz.)	100 g (3.5 oz.)	3.5 mm (0.138 in)	1 mm (0.039 in)	0.12 mm (0.005 in)	49.7 ±0.8 mm (1.96 ±0.03 in)
ZE-NA2-2S	Sealed roller arm lever	640 g (22.6 oz.)	230 g (8.1 oz.)	6 mm (0.236 in)	5 mm (0.197 in)	0.4 mm (0.016 in)	—
ZE-NA277-2S	Sealed one-way action arm lever	640 g (22.6 oz.)	230 g (8.1 oz.)	6 mm (0.236 in)	5 mm (0.197 in)	0.4 mm (0.016 in)	—
ZE-NCL-2S	Sealed rod lever	170 g (6.0 oz.)	60 g (2.1 oz.)	22 mm (0.866 in)	18.5 mm (0.728 in)	1.5 mm (0.059 in)	—
ZE-NJ-2S	Sealed coil spring	150 g (5.3 oz.)	—	—	15°	—	—

ZV2-Q General Purpose and ZV2-N Sealed, Diagonal Side Mounting Switches

Part number	Description	OF	RF	OT	PT	MD	OP
ZV2-Q-2S	Pin plunger	250 to 350 g (8.8 to 12.3 oz.)	114 g (4.0 oz.)	5.5 mm (0.217 in)	0.4 mm (0.016 in)	0.05 mm (0.002 in)	63.7 ±0.8 mm (2.51 ±0.03 in)
ZV2-Q22-2S	Roller plunger	250 to 350 g (8.8 to 12.3 oz.)	114 g (4.0 oz.)	3.6 mm (0.142 in)	0.5 mm (0.020 in)	0.05 mm (0.002 in)	75.2 ±0.8 mm (2.96 ±0.03 in)
ZV2-Q21-2S	Cross roller plunger	250 to 350 g (9.8 to 12.3 oz.)	114 g (4.0 oz.)	3.6 mm (0.142 in)	0.5 mm (0.020 in)	0.05 mm (0.002 in)	75.2 ±0.8 mm (2.96 ±0.03 in)
ZV2-QA2-2S	Roller arm lever	570 g (20.1 oz.)	170 g (6.0 oz.)	6 mm (0.236 in)	4 mm (0.157 in)	0.4 mm (0.016 in)	—
ZV2-QA277-2S	One-way action arm lever	570 g (20.1 oz.)	170 g (6.0 oz.)	6 mm (0.236 in)	4 mm (0.157 in)	0.4 mm (0.016 in)	—
ZV2-QCL-2S	Rod lever	153 g (5.4 oz.)	45 g (1.6 oz.)	22 mm (0.866 in)	15 mm (0.591 in)	1.5 mm (0.059 in)	—
ZV2-N-2S	Sealed pin plunger	800 g (28.2 oz.)	240 g (8.5 oz.)	5 mm (0.197 in)	2 mm (0.079 in)	0.1 mm (0.004 in)	71.4 ±0.8 mm (2.81 ±0.03 in)
ZV2-N22-2S	Sealed roller plunger	500 g (17.6 oz.)	100 g (3.5 oz.)	3.5 mm (0.138 in)	1 mm (0.039 in)	0.12 mm (0.005 in)	35.7 ±0.8 mm (1.41 ±0.03 in)
ZV2-N21-2S	Sealed cross roller plunger	500 g (17.6 oz.)	100 g (3.5 oz.)	3.5 mm (0.138 in)	1 mm (0.039 in)	0.12 mm (0.005 in)	35.7 ±0.8 mm (1.41 ±0.03 in)
ZV2-NA2-2S	Sealed roller arm lever	640 g (22.6 oz.)	230 g (8.1 oz.)	6 mm (0.236 in)	5 mm (0.197 in)	0.4 mm (0.016 in)	—
ZV2-NA277-2S	Sealed one-way action arm lever	640 g (22.6 oz.)	230 g (8.1 oz.)	6 mm (0.236 in)	5 mm (0.197 in)	0.4 mm (0.016 in)	—
ZV2-NCL-2S	Sealed rod lever	170 g (6.0 oz.)	60 g (2.1 oz.)	22 mm (0.866 in)	18.5 mm (0.728 in)	1.5 mm (0.059 in)	—
ZV2-NJ-2S	Sealed coil spring	150 g (5.3 oz.)	—	—	15°	—	—

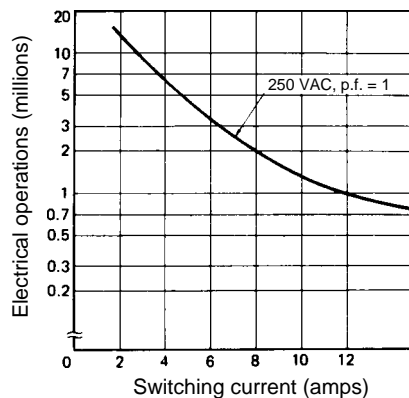
Legend: OF = Operating Force (max.); RF = Reset Force (min.); OT = Overtravel (min.); PT = Pretravel;
MD = Movement Differential (max.); OP = Operating Position

ZV-Q General Purpose and ZV-N Sealed, Flanged Base Mounting Switches

Part number	Description	OF	RF	OT	PT	MD	OP
ZV-Q-2S	Pin plunger	250 to 350 g (8.8 to 12.3 oz.)	114 g (4.0 oz.)	5.5 mm (0.217 in)	0.4 mm (0.016 in)	0.05 mm (0.002 in)	63.7 ±0.8 mm (2.51 ±0.03 in)
ZV-Q22-2S	Roller plunger	250 to 350 g (8.8 to 12.3 oz.)	114 g (4.0 oz.)	3.6 mm (0.142 in)	0.5 mm (0.020 in)	0.05 mm (0.002 in)	75.2 ±0.8 mm (2.96 ±0.03 in)
ZV-Q21-2S	Cross roller plunger	250 to 350 g (9.8 to 12.3 oz.)	114 g (4.0 oz.)	3.6 mm (0.142 in)	0.5 mm (0.020 in)	0.05 mm (0.002 in)	75.2 ±0.8 mm (2.96 ±0.03 in)
ZV-QA2-2S	Roller arm lever	570 g (20.1 oz.)	170 g (6.0 oz.)	6 mm (0.236 in)	4 mm (0.157 in)	0.4 mm (0.016 in)	—
ZV-QA277-2S	One-way action arm lever	570 g (20.1 oz.)	170 g (6.0 oz.)	6 mm (0.236 in)	4 mm (0.157 in)	0.4 mm (0.016 in)	—
ZV-QCL-2S	Rod lever	153 g (5.4 oz.)	45 g (1.6 oz.)	22 mm (0.866 in)	15 mm (0.591 in)	1.5 mm (0.059 in)	—
ZV-N-2S	Sealed pin plunger	800 g (28.2 oz.)	240 g (8.5 oz.)	5 mm (0.197 in)	2 mm (0.079 in)	0.1 mm (0.004 in)	71.4 ±0.8 mm (2.81 ±0.03 in)
ZV-NA2-2S	Sealed roller arm lever	640 g (22.6 oz.)	230 g (8.1 oz.)	6 mm (0.236 in)	5 mm (0.197 in)	0.4 mm (0.016 in)	—
ZV-NA277-2S	Sealed one-way action arm lever	640 g (22.6 oz.)	230 g (8.1 oz.)	6 mm (0.236 in)	5 mm (0.197 in)	0.4 mm (0.016 in)	—
ZV-NCL-2S	Sealed rod lever	170 g (6.0 oz.)	60 g (2.1 oz.)	22 mm (0.866 in)	18.5 mm (0.728 in)	1.5 mm (0.059 in)	—
ZV-NJ-2S	Sealed coil spring	150 g (5.3 oz.)	—	—	15°	—	—

Engineering Data

■ ELECTRICAL SERVICE LIFE



■ CONTACT RATINGS

15 A at 125, 250 and 480 VAC
1/8 HP at 125 VAC, 1/4 HP at 250 VAC
0.5 A at 125 VDC, 0.25 A at 250 VDC

■ CONTACT RESISTANCE

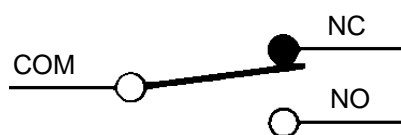
15 mΩ max. (initial)

■ ELECTRICAL APPROVALS

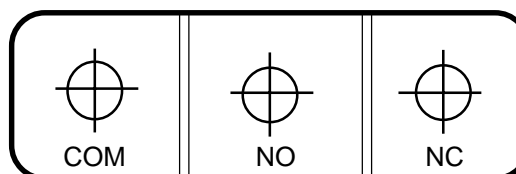
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Operation

■ CONTACT FORM



■ TERMINAL ARRANGEMENT

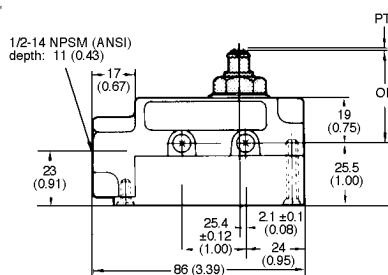
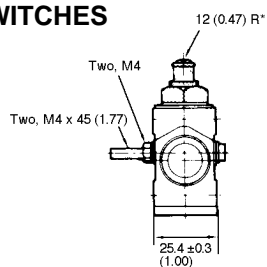
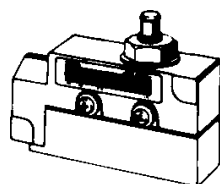


Dimensions

Unit: mm (inch)

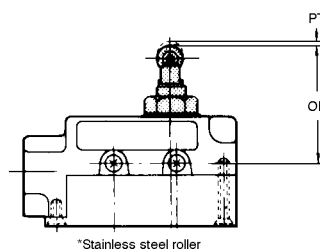
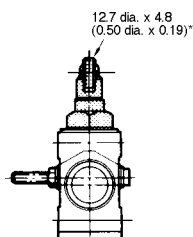
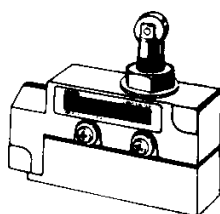
■ ZE SIDE-MOUNTING SWITCHES

ZE-Q-2S Plunger Switch



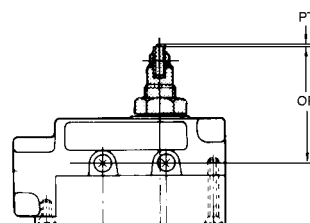
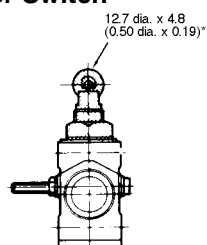
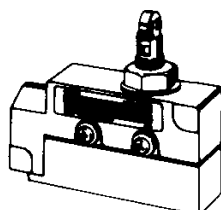
*Stainless steel plunger

ZE-Q22-2S Roller Plunger Switch



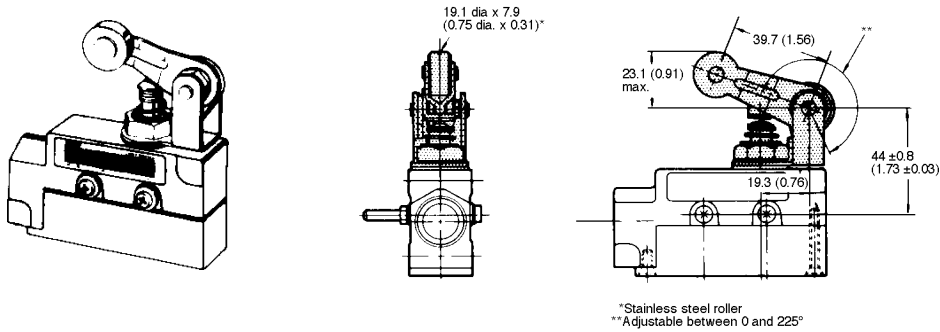
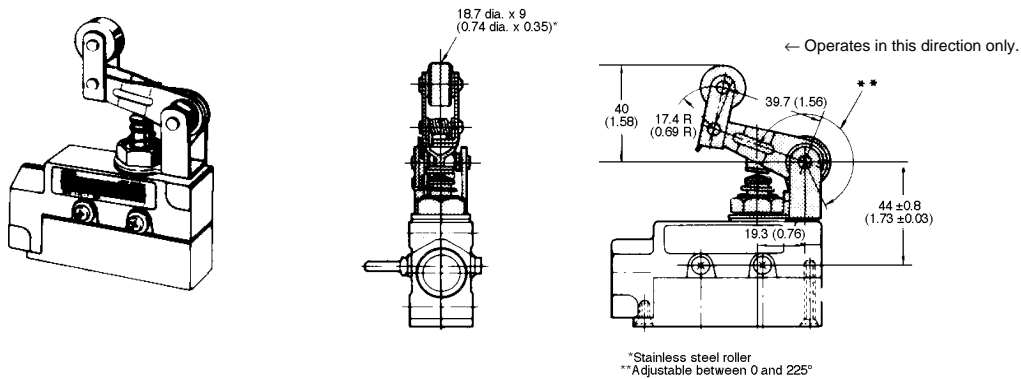
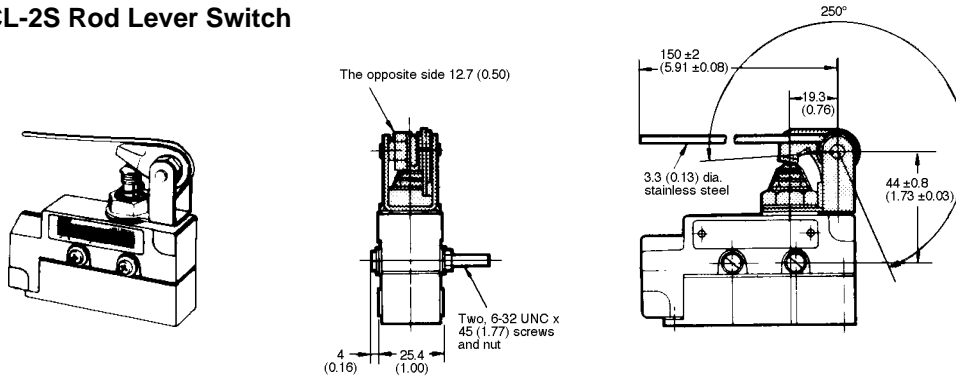
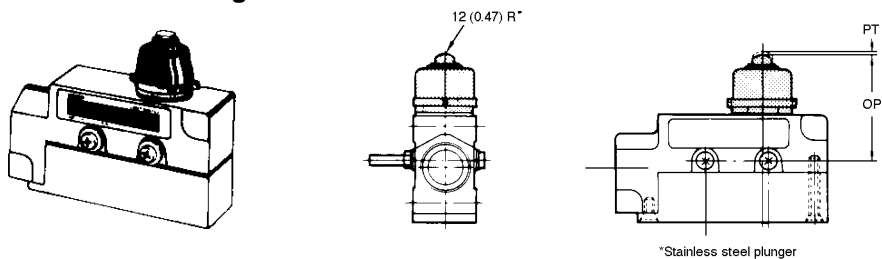
*Stainless steel roller

ZE-Q21-2S Cross Roller Plunger Switch

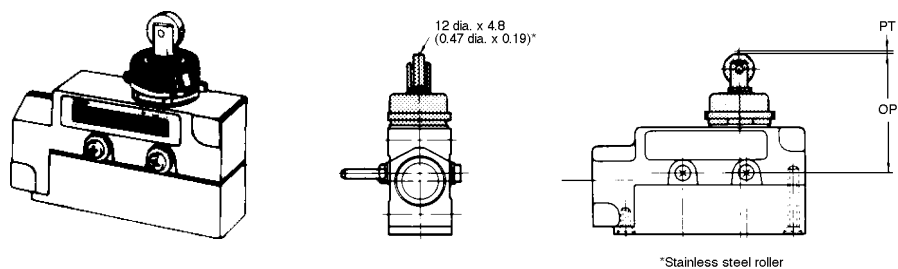


*Stainless steel roller

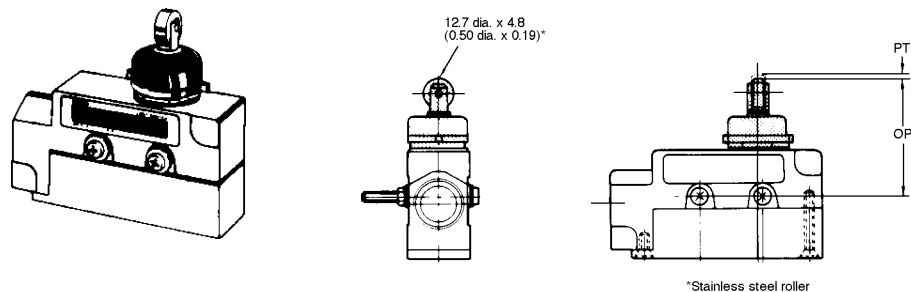
Unit: mm (inch)

ZE-QA2-2S Roller Arm Lever Switch**ZE-QA277-2S One-Way Action Arm Lever Switch****ZE-QCL-2S Rod Lever Switch****ZE-N-2S Sealed Plunger Switch**

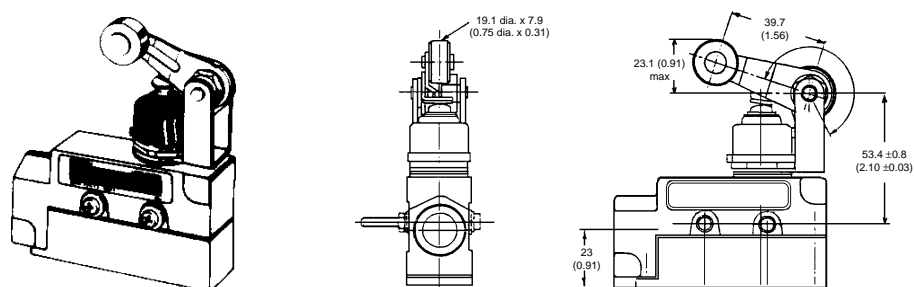
ZE-N22-2S Sealed Roller Plunger Switch



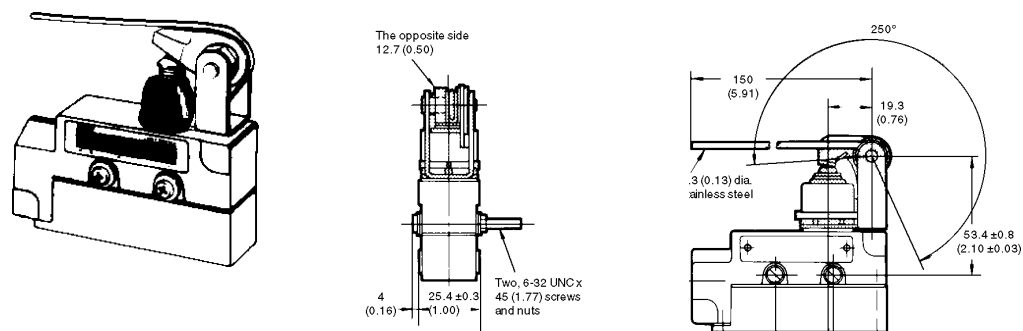
ZE-N21-2S Sealed Cross Roller Plunger Switch



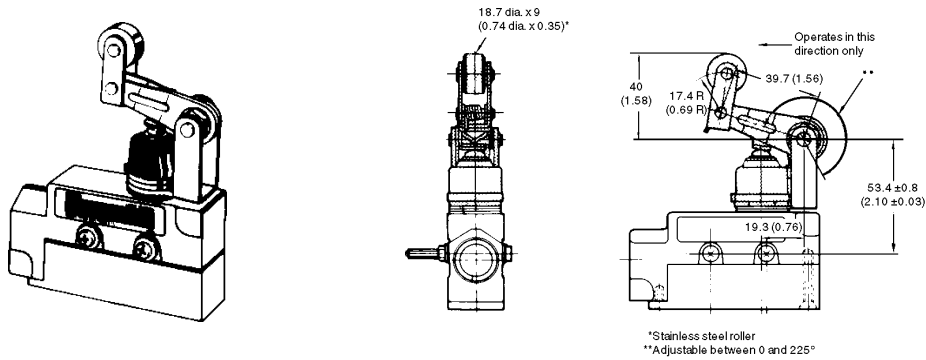
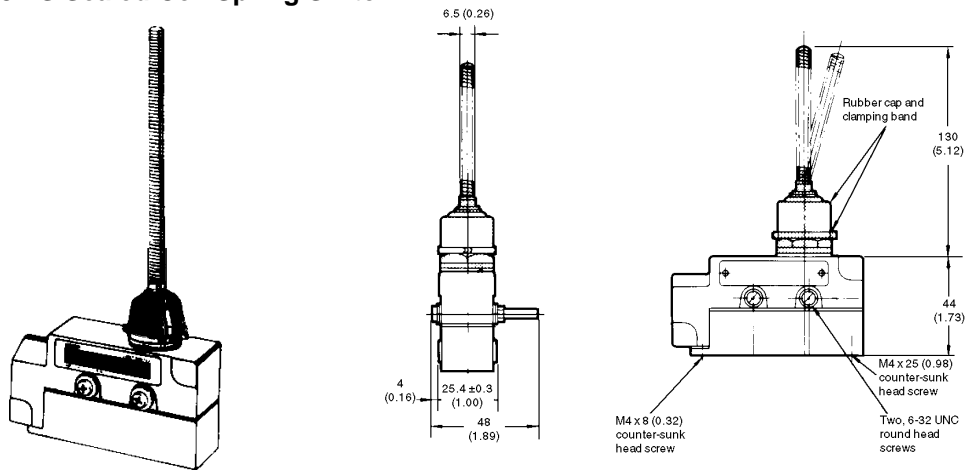
ZE-NA2-2S Sealed Roller Arm Lever Switch



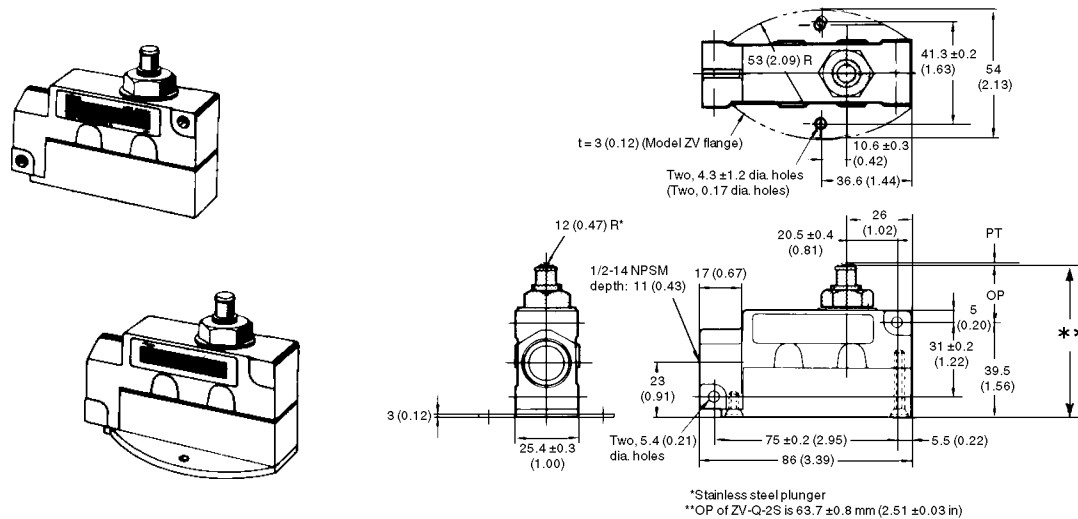
ZE-NCL-2S Sealed Rod Lever Switch



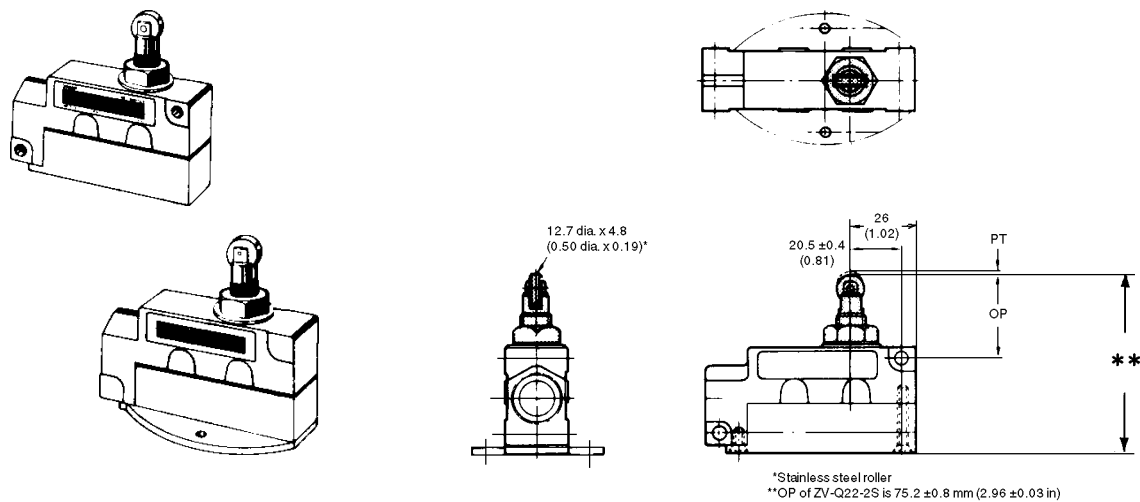
Unit: mm (inch)

ZE-NA277-2S Sealed One-Way Action Arm Lever Switch**ZE-NJ-2S Sealed Coil Spring Switch****■ ZV2 DIAGONAL SIDE-MOUNTING SWITCHES, ZV FLANGED BASE-MOUNTING SWITCHES**

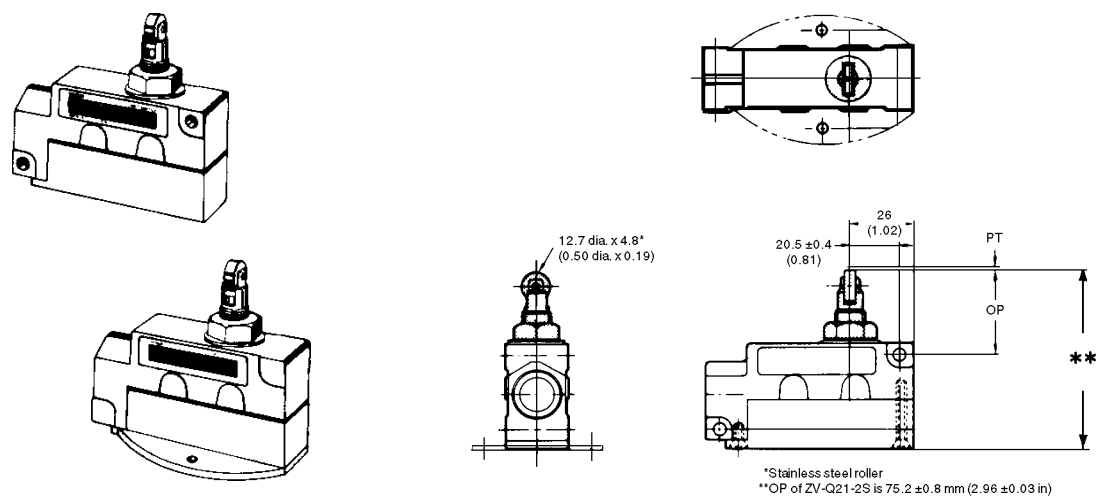
In the drawings, flanged base mounting switches (ZV type) are shown by alternating long lines and short dashes.

ZV2-Q-2S and ZV-Q-2S Plunger Switches

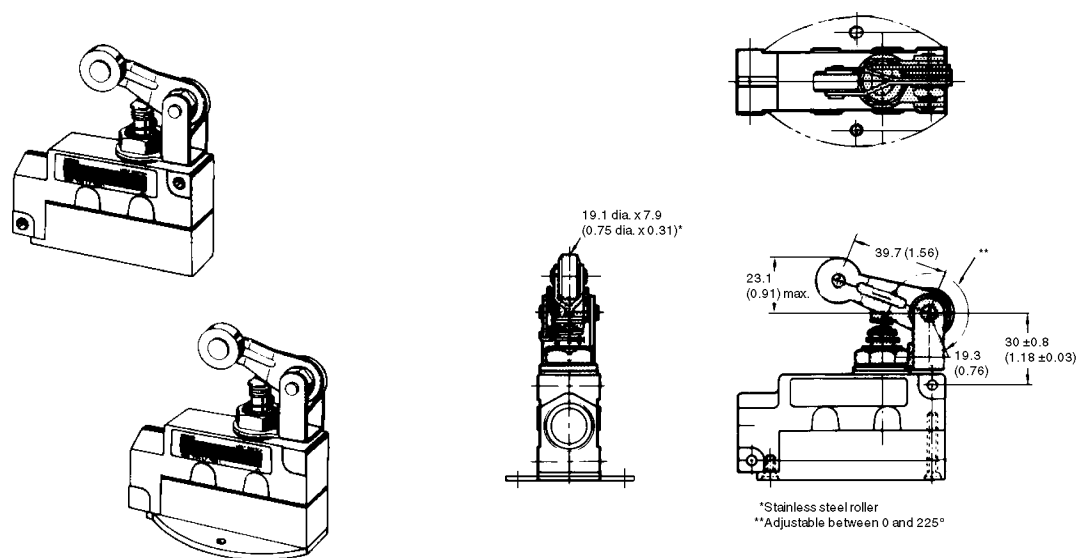
ZV2-Q22-2S and ZV-Q22-2S Roller Plunger Switches



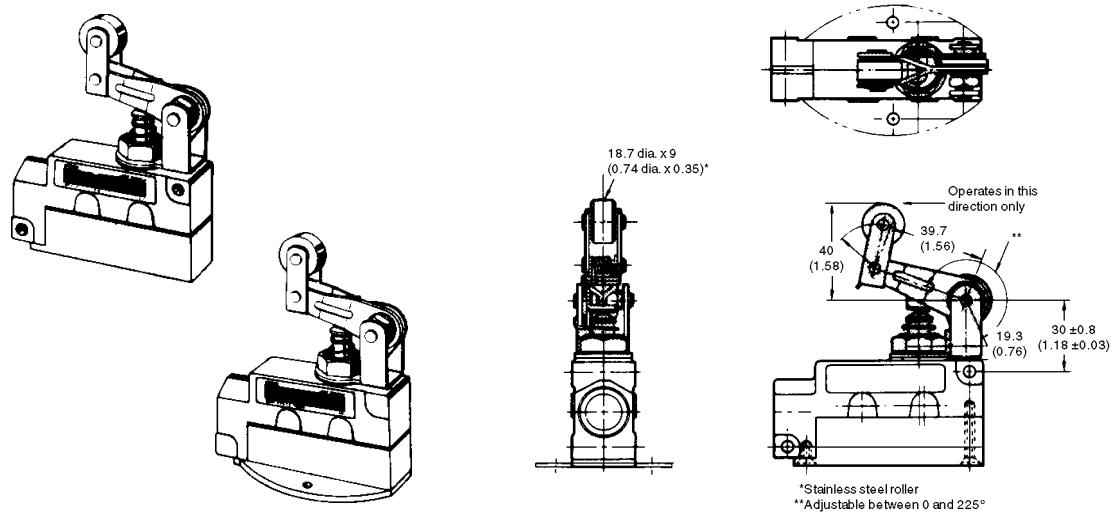
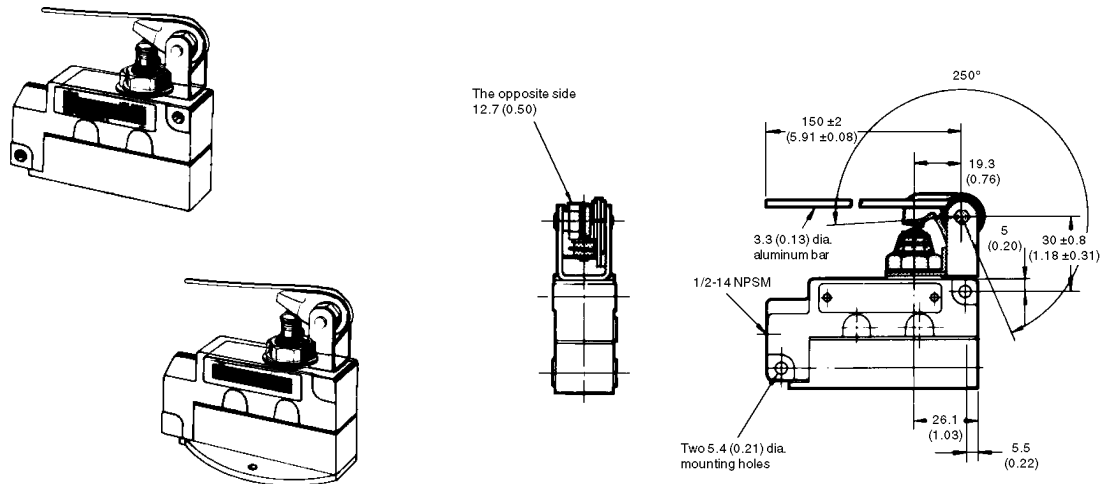
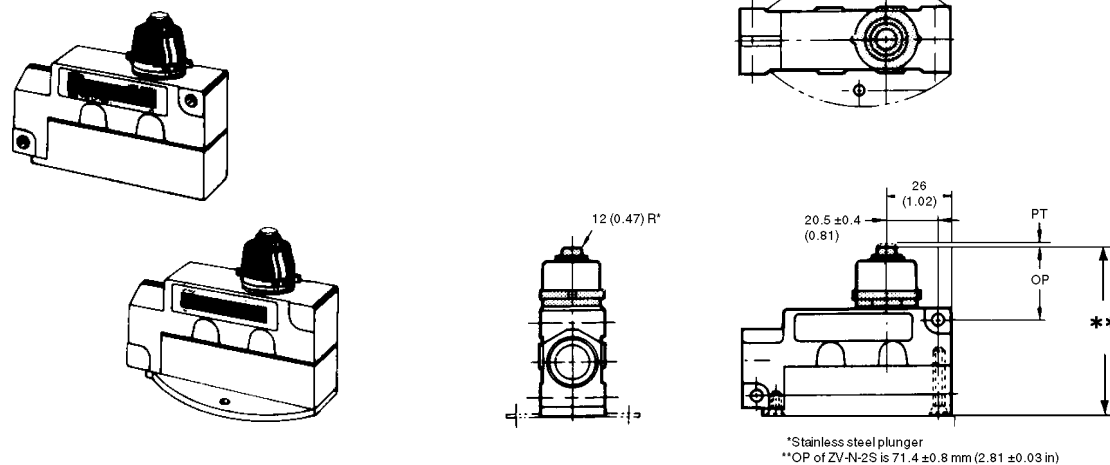
ZV2-Q21-2S and ZV-Q21-2S Cross Roller Plunger Switches



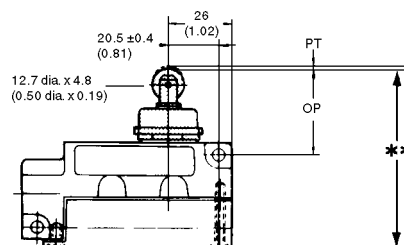
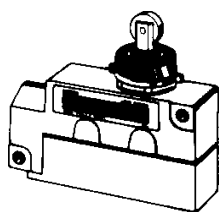
ZV2-QA2-2S and ZV-QA2-2S Roller Arm Lever Switches



Unit: mm (inch)

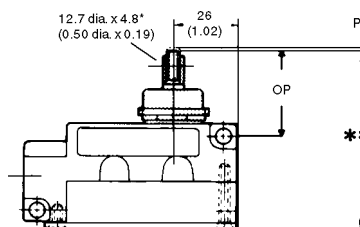
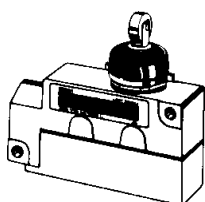
ZV2-QA277-2S and ZV-QA277-2S One-Way Action Arm Lever Switches**ZV2-QCL-2S and ZV-QCL-2S Rod Lever Switches****ZV2-N-2S and ZV-N-2S Sealed Plunger Switches**

ZV2-N22-2S Sealed Roller Plunger Switch



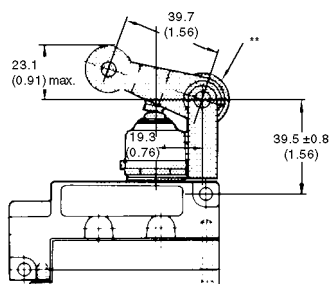
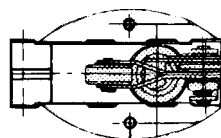
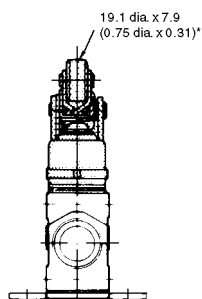
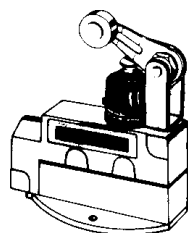
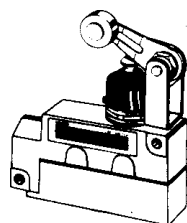
*Stainless steel roller
 **OP of ZV-N22-2S is 75.2 ± 0.8 mm (2.96 ± 0.03 in)

ZV2-N21-2S Sealed Cross Roller Plunger Switch



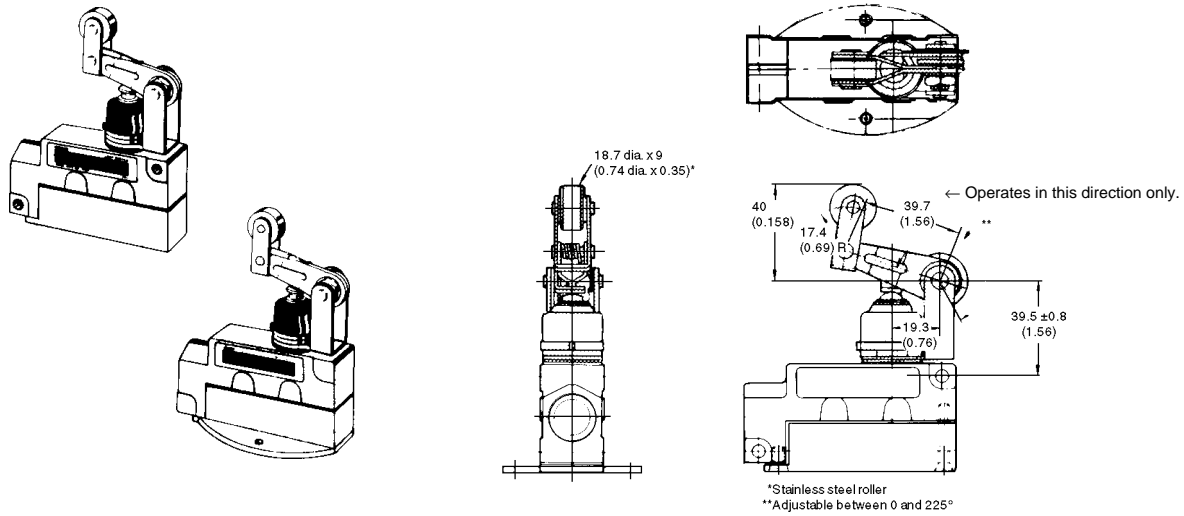
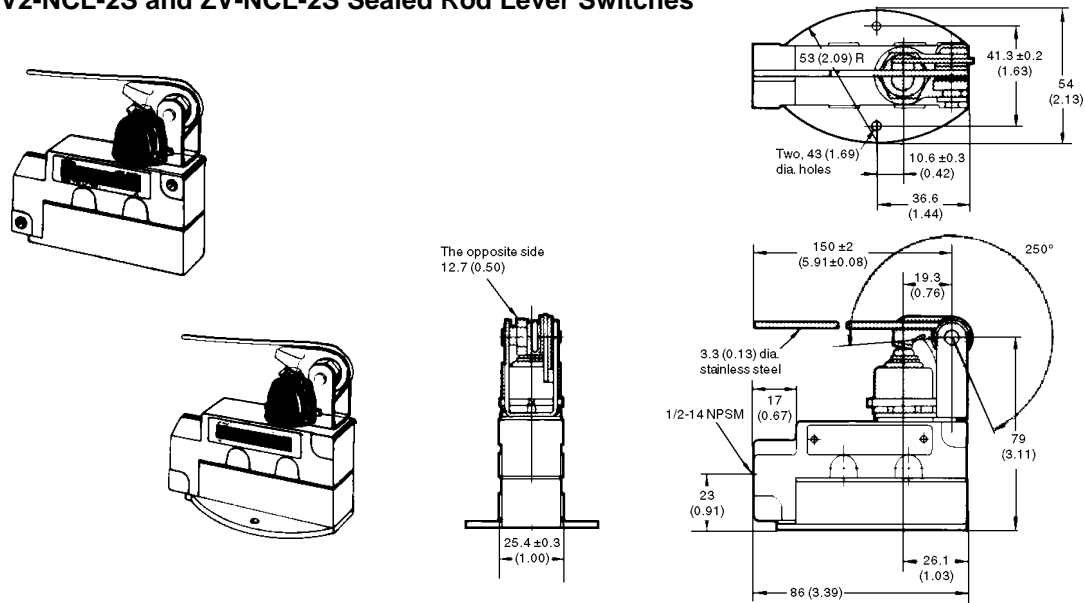
*Stainless steel roller
 **OP of ZV-N21-2S is 75.2 ± 0.8 mm (2.96 ± 0.03 in)

ZV2-NA2-2S and ZV-NA2-2S Sealed Roller Arm Lever Switches

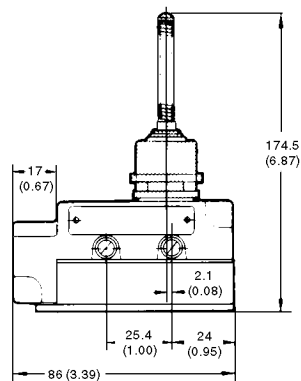
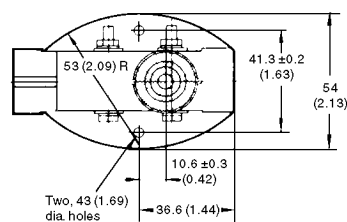
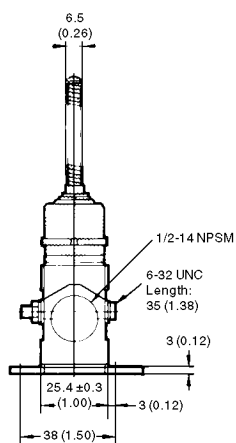
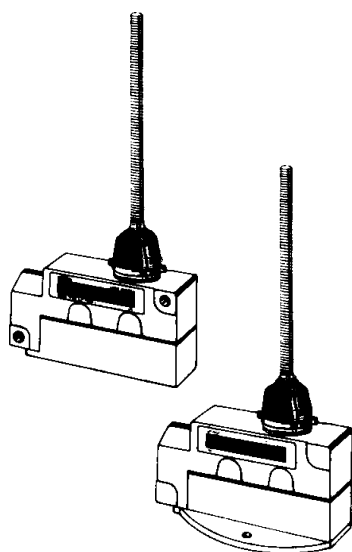


*Stainless steel roller
 **Adjustable between 0 and 225°

Unit: mm (inch)

ZV2-NA277-2S and ZV-NA277-2S Sealed One-Way Action Arm Lever Switches**ZV2-NCL-2S and ZV-NCL-2S Sealed Rod Lever Switches**

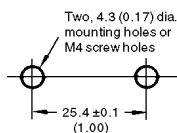
ZV2-NJ-2S and ZV-NJ-2S Sealed-Coil Spring Switches



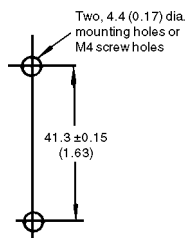
Installation

■ MOUNTING HOLES

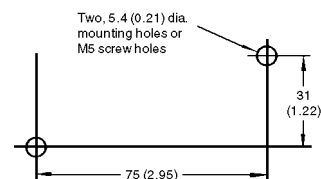
ZE Side-Mounting Switches



ZV Flanged Base-Mounting Switches



ZV2 Diagonal Side-Mounting Switches



■ INSTALLATION TIPS

Actuators on roller lever switches have been loosened for shipment so the position may be adjusted anywhere in 225°. Be sure to tighten the lever when mounting it.

To maintain the seals around the mounting screws, O-rings have been supplied with the switch. Insert each O-ring and secure it with a lock nut.

When routing wires into the conduit opening, be sure that no wire cuttings or other foreign matter enter the switch.



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11/01

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