

Snap Action Switch
















X

General Purpose Snap Action Switch

- Direct current switch with built-in magnetic blowout
- Incorporates a small permanent magnet in the contact mechanism to deflect the arc to effectively extinguish it
- Ideal for switching DC circuits
- Wide variety of actuators for a wide scope of applications
- Same shape as OMRON Model Z snap action switch



Ordering Information

Actuator	Model	Model	
		Solder terminal	Screw terminal
Pin plunger		X-10G	X-10G-B
Spring plunger		X-10GS	X-10GS-B
Short spring plunger		X-10GD	X-10GD-B
Panel mount plunger		X-10GQ	X-10GQ-B
Panel mount roller plunger		X-10GQ22	X-10GQ22-B
Panel mount cross roller plunger		X-10GQ21	X-10GQ21-B
Leaf spring		X-10GL	X-10GL-B
Short hinge lever		X-10GW21	X-10GW21-B
Hinge lever		X-10GW	X-10GW-B
Low force hinge lever		X-10GW4	X-10GW4-B
Short hinge roller lever		X-10GW22	X-10GW22-B
Hinge roller lever		X-10GW2	X-10GW2-B
Reverse action hinge lever		X-10GM	X-10GM-B
Reverse action short hinge roller lever		X-10GM22	X-10GM22-B
Reverse action hinge roller lever		X-10GM2	X-10GM2-B

- Note:**
1. With reverse action type actuators, the plunger is always held down by the action of the compression coil spring, and operates the switch when released from the down position by the action of the lever. Since the plunger is held down with the actuator in the free state, the switch has excellent resistance to vibration and shock.
 2. Models conforming to UL and CSA are so marked. However, those conforming to SEV are not marked. The mark "SEV" can be inscribed on request (in this case, however, neither "UL" nor "CSA" can be inscribed.)

Specifications

■ Characteristics

Operating speed		0.1 mm to 1 m/second (.004 to 39.4 in./second) at pin plunger
Operating frequency	Mechanical	240 operations per minute
	Electrical	20 operations per minute
Contact resistance		15 mΩ max. (initial)
Insulation resistance		100 mΩ min. (at 500 VDC)
Dielectric strength (VAC)		1,500 VAC, 50/60 Hz for 1 minute between non-continuous terminals, between each terminal and noncurrent-carrying part and between each terminal and ground
Vibration	Malfunction durability	10 to 55 Hz, 1.5 mm double amplitude
Shock	Mechanical durability	1,000 m/s ² min. (approx. 100 g)
	Malfunction durability	300 m/s ² min. (approx. 30 g)
Ambient temperature	Operating	-25° to 80°C (with no icing)
Humidity		35% to 85% RH
Service life	Mechanical	1,000,000 operations minimum (at rated OT value)
	Electrical	100,000 operations minimum (under rated load)
Weight		Approx. 27 to 63 g

Note: Data shown are of initial value.

■ Operating Characteristics

Characteristics	Part number					
	X-10G-B	X-10GS-B	X-10GD-B	X-10GQ-B	X-10GQ22-B	X-10GQ21-B
OF max.	510 g					
RF min.	114 g					
PT max.	0.9 mm (0.04 in)					
OT min.	0.13 mm (0.01 in)	1.16 mm (0.06 in)		5.5 mm (0.22 in)	3.6 mm (0.14 in)	
MD max.	0.18 mm (0.01 in)					
OP	15.9 ± 0.4 mm (0.63 ± 0.02 in)	28.2 ± 0.5 mm (1.11 ± 0.02 in)	21.2 ± 0.5 mm (0.83 ± 0.02 in)	21.2 ± 0.8 mm (0.83 ± 0.03 in)	33.4 ± 1.2 mm (1.31 ± 0.05 in)	

Characteristics	Part number					
	X-10GL-B	X-10GW21-B	X-10GW-B	X-10GW4-B	X-10GW22-B	X-10GW2-B
OF max.	200 g	250 g	110 g	25 g	220 g	145 g
RF min.	14 g	32 g	14 g	5 g	35 g	21 g
PT max.	5.4 mm* (0.21 in)	5.6 mm* (0.22 in)	14.3 mm* (0.56 in)	14.3 mm (0.56 in)	5.7 mm* (0.22 in)	9.1 mm* (0.35 in)
OT min.	1.6 mm** (0.06 in)	2.1 mm (0.08 in)	4.8 mm (0.19 in)		2.4 mm (0.09 in)	4 mm (0.16 in)
MD max.	2.3 mm (0.09 in)	1.7 mm (0.07 in)	3.9 mm (0.15 in)		1.7 mm (0.07 in)	3 mm (0.12 in)
FP max.	22.1 mm (0.87 in)	25.5 mm (1.00 in)	34.6 mm (1.36 in)	—	37.1 mm (1.46 in)	40.5 mm (1.59 in)
OP	17.4 ± 0.8 mm (0.69 ± 0.03 in)	20.7 ± 0.8 mm (0.81 ± 0.03 in)	21.1 ± 0.8 mm (0.83 ± 0.03 in)		32.2 ± 0.8 mm (1.27 ± 0.03 in)	

Characteristics	Part number		
	X-10GM-B	X-10GM22-B	X-10GM2-B
OF max.	220 g	700 g	320 g
RF min.	25 g	150 g	50 g
PT max.	6.5 mm* (0.26 in)	4.7 mm* (0.19 in)	6 mm* (0.24 in)
OT min.	5.5 mm (0.22 in)	2 mm (0.08 in)	4 mm (0.16 in)
MD max.	2.1 mm (0.08 in)	0.75 mm (0.03 in)	1.5 mm (0.06 in)
FP max.	26.8 mm (1.06 in)	36.1 mm (1.42 in)	37.4 mm (1.47 in)
OP	21.1 ± 0.8 mm (0.83 ± 0.03 in)	32.2 ± 0.8 mm (1.27 ± 0.03 in)	

* Reference value

** Be certain to use switch at the rated OT of 1.6 mm (0.06 in).

■ Lever/Plunger Operating Characteristics — X Series Accessories

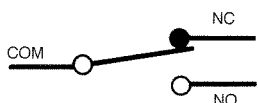
Characteristics	Part number				
	XAA-1 with X-10G	XAA-2 with X-10G	ZAQ-3 with X-10G	ZAQ-2 with X-10G	ZAQ-1 with X-10G
OF max.	500 g		550 g		
RF min.	170 g		144 g		
RT max.	7.2 mm* (0.28 in)	7.3 mm* (0.29 in)	1 mm (0.04 in)		
OT min.	12.7 mm (0.50 in)		4.5 mm (0.18 in)	20.4 mm (0.80 in)	
MD max.	3.3 mm (0.13 in)		0.2 mm (0.01 in)		
FP	32.9 ± 1.6 mm (1.30 ± 0.06 in)	44.5 ± 1.6 mm (1.75 ± 0.06 in)	—		
OP	28.9 ± 1.6 mm (1.14 ± 0.06 in)	40.4 ± 1.6 mm (1.59 ± 0.06 in)	27.8 ± 1.5 mm (1.09 ± 0.06 in)	53.2 ± 1.5 mm (2.09 ± 0.06 in)	69.1 ± 1.5 mm (2.72 ± 0.06 in)

■ Ratings

Rated voltage	Non-inductive load (A)			Inductive load (A)				
	Resistive load	Lamp load		Inductive load		Motor load		
		NC	NO	NC	NO	NC	NO	
8 VDC	10	3	1.5	10	10	5	2.5	
14 VDC	10	3	1.5	10	10	5	2.5	
30 VDC	10	3	1.5	10	10	5	2.5	
125 VDC	10	3	1.5	7.5	6	5	2.5	
250 VDC	3	1.5	0.75	2	1.5	2	1.5	
Inrush current	NC: 30 A max.		NO: 15 A max.		NC: 30 A max.		NO: 15 A max.	

- Note:**
1. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 milliseconds max. (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.
 3. The UL and CSA listed marks are stamped on all standard products. The SEV approval mark may be stamped on request. In such a case, however, the UL and CSA markings will not be provided on the requested product.

■ Contact Form



■ Approvals

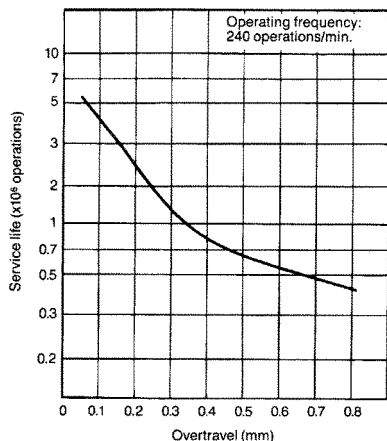
UL (File No. E41515)/CSA (File No. LR21642)/LLOYD (File No. KOB-412171)/SEV (File No. D3, 21/115a)
 X-10G: IEC 1058-1
 X-10Gw: EN Conforms 61058-1

Type	Rating
X-10 series	10 A, 125 VDC 3 A, 250 VDC

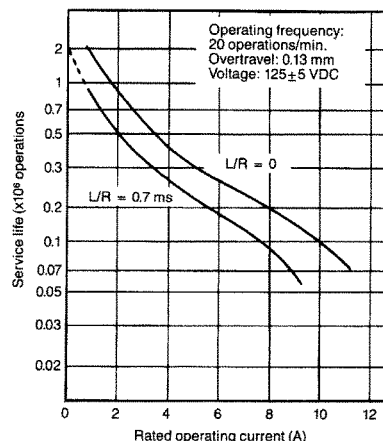
Note: The rated values approved by each of the safety standards (e.g. UL, CSA) may be different from the performance characteristics individually defined in this catalog.

Engineering Data

■ Mechanical Service Life



■ Electrical Service Life

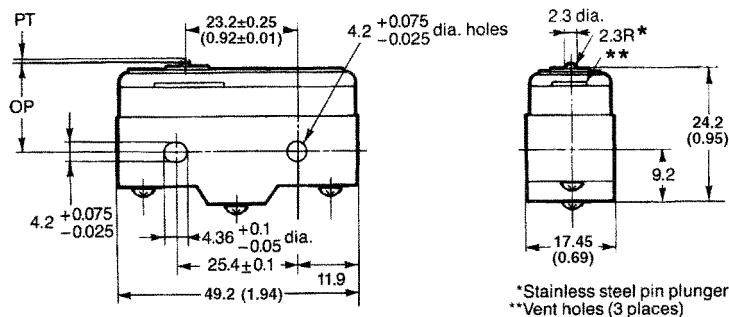


Dimensions

Unit: mm (inch)

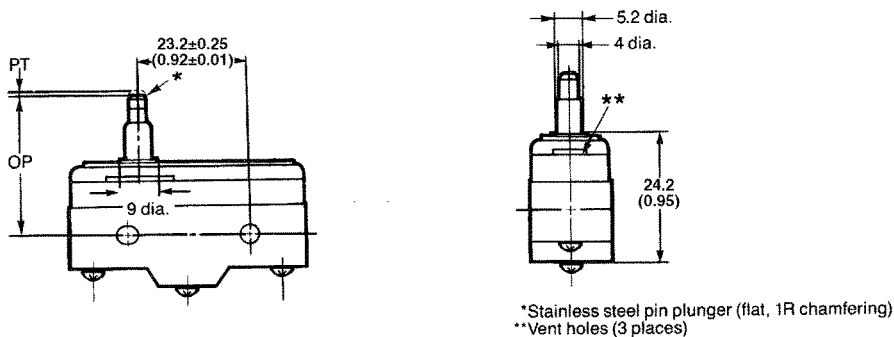
■ Pin Plunger

X-10G-B



■ Spring Plunger

X-10GS-B

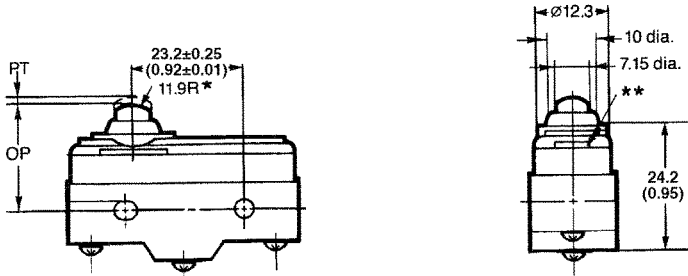


Note: 1. All drawings show the switches with screw terminals. For solder terminals, remove the “-B” from the end of the part number.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Unit: mm (inch)

■ Short Spring Plunger

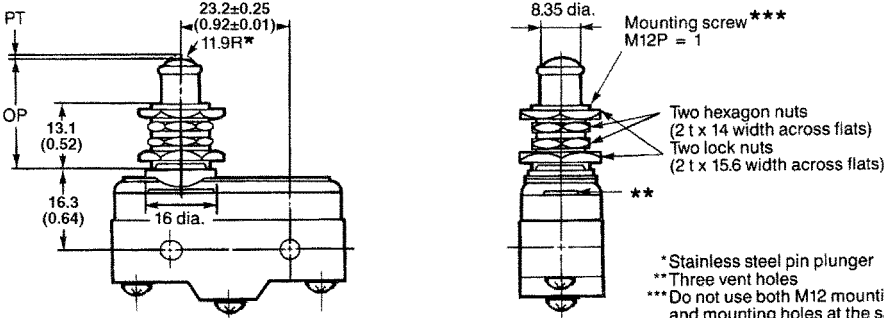
X-10GD-B



*Plated iron plunger
**Three vent holes

■ Panel Mount Plunger

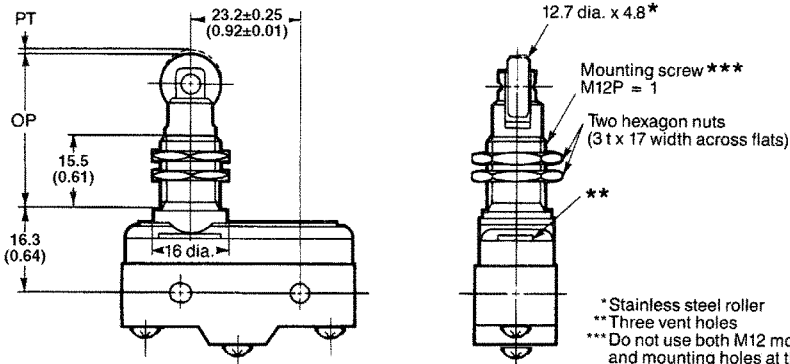
X-10GQ-B



*Stainless steel pin plunger
**Three vent holes
***Do not use both M12 mounting screw and mounting holes at the same time.

■ Panel Mount Roller Plunger

X-10GQ22-B

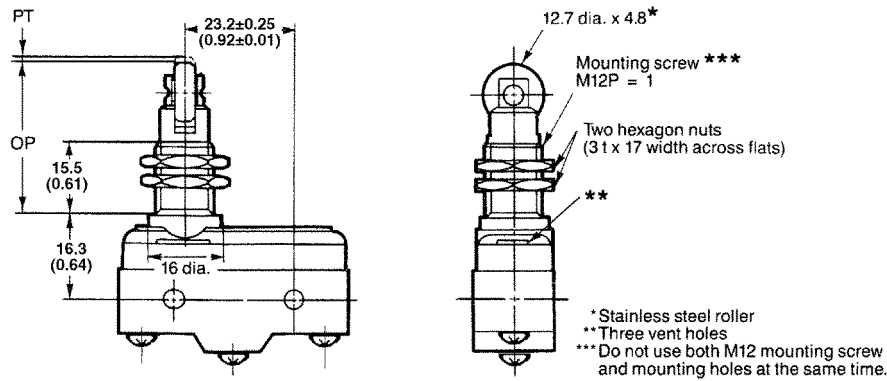


*Stainless steel roller
**Three vent holes
***Do not use both M12 mounting screw and mounting holes at the same time.

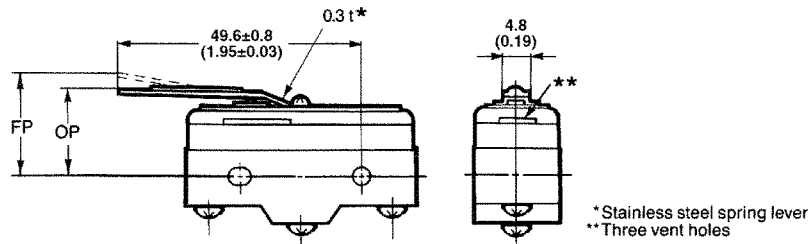
Note: 1. All drawings show the switches with screw terminals. For solder terminals, remove the “-B” from the end of the part number.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Unit: mm (inch)

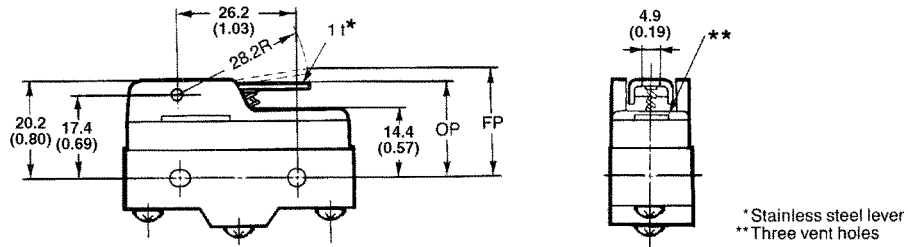
■ Panel Mount Cross Roller Plunger X-10GQ21-B



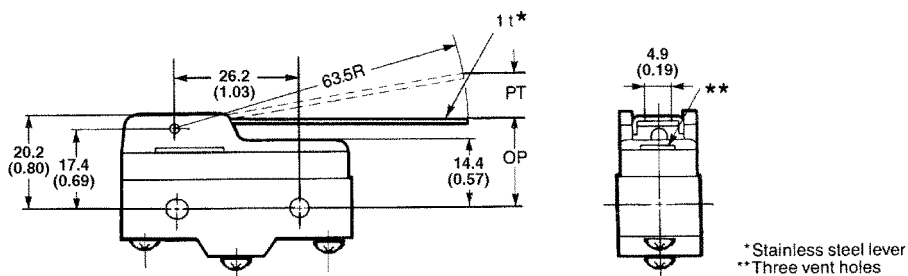
■ Leaf Spring X-10GL-B



■ Short Hinge Lever X-10GW21-B



■ Hinge Lever X-10GW-B

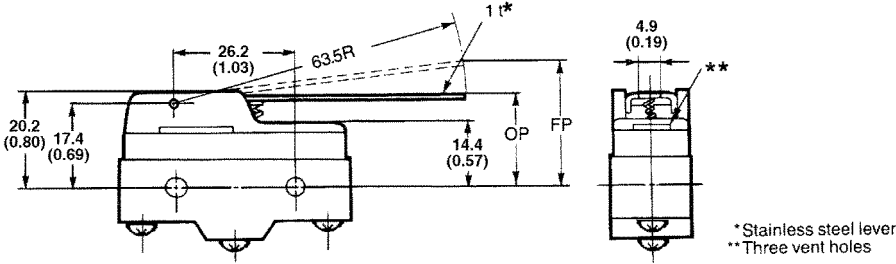


Note: 1. All drawings show the switches with screw terminals. For solder terminals, remove the “-B” from the end of the part number.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Unit: mm (inch)

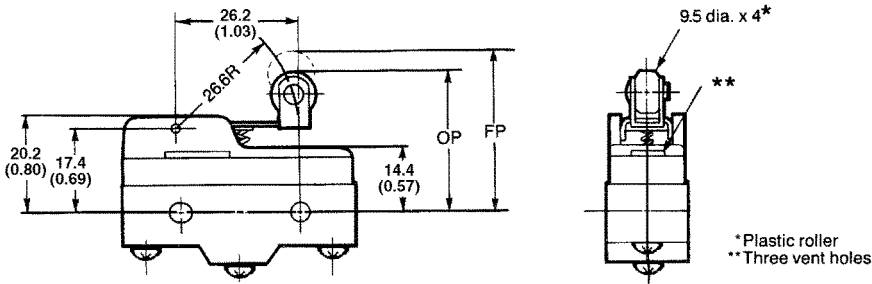
Low Force Hinge Lever

X-10GW4-B



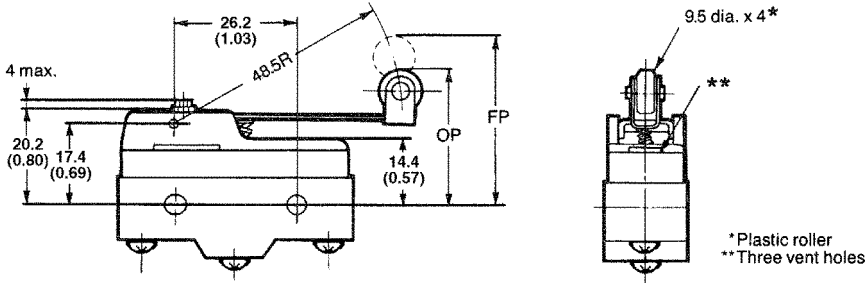
Short Hinge Roller Lever

X-10GW22-B



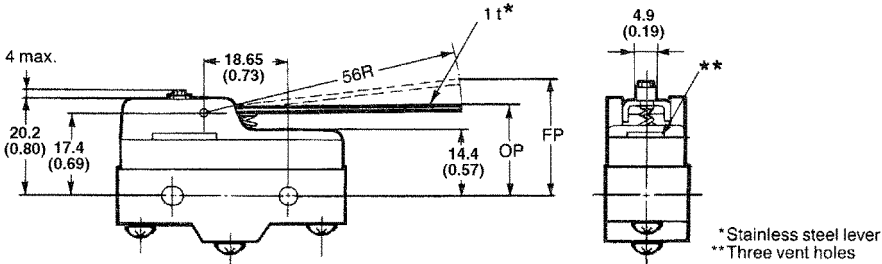
Hinge Roller Lever

X-10GW2-B



Reverse Action Hinge Lever

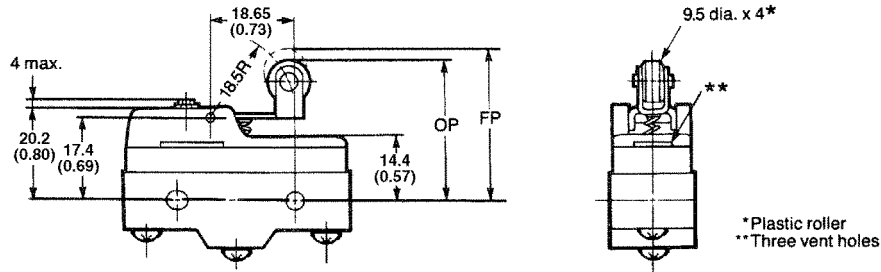
X-10GM-B



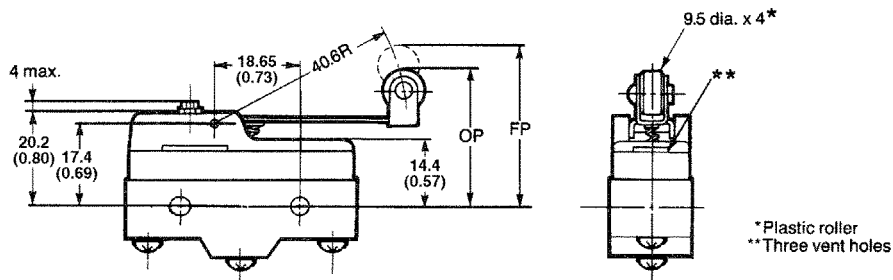
Note: 1. All drawings show the switches with screw terminals. For solder terminals, remove the “-B” from the end of the part number.
 2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Unit: mm (inch)

Reverse Action Short Hinge Roller Lever X-10GM22-B



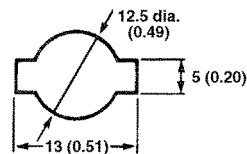
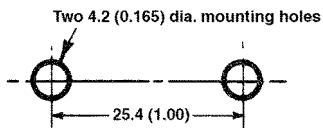
Reverse Action Hinge Roller Lever X-10GM2-B



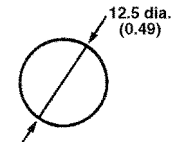
Note: 1. All drawings show the switches with screw terminals. For solder terminals, remove the “-B” from the end of the part number.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Mounting Holes

Panel cutout
Panel mount pin plunger



Panel mount roller
pin plunger



Accessory Dimensions

Hinge lever
XAA-1



Hinge roller lever
XAA-2

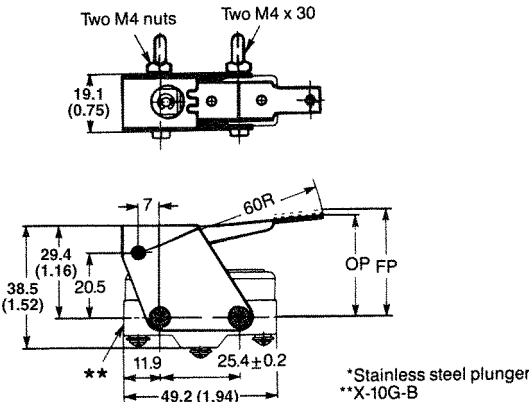


Panel mount plunger
Short ZAQ-3
Medium AZQ-2
Long ZAQ-1



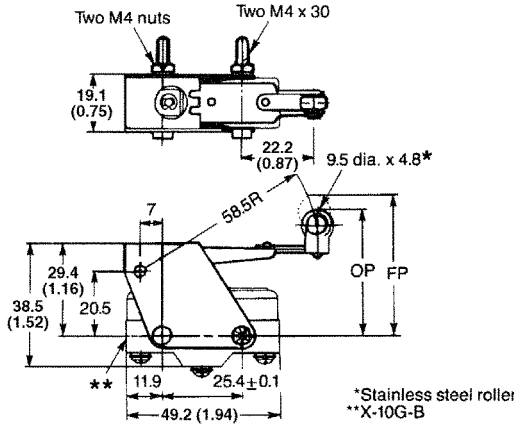
■ Hinge Lever

XAA-1



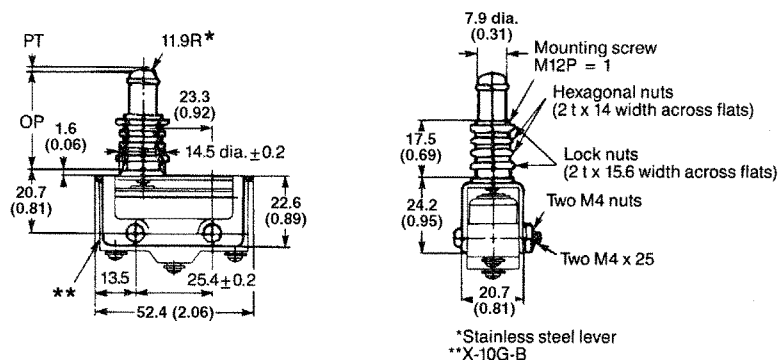
■ Hinge Roller Lever

XAA-2



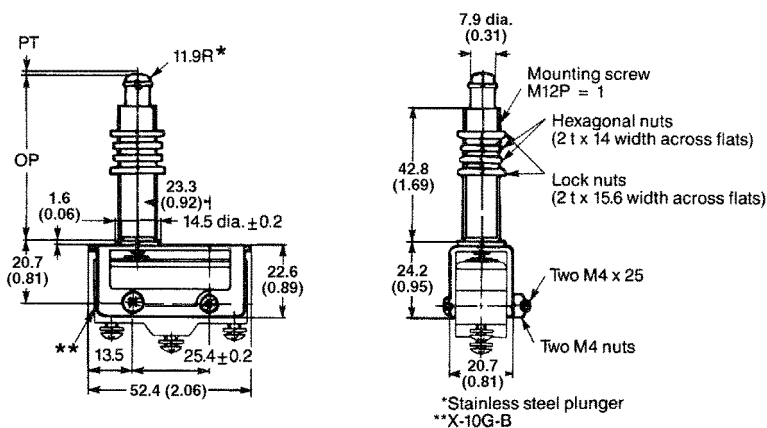
■ Panel Mount Plunger

ZAQ-3



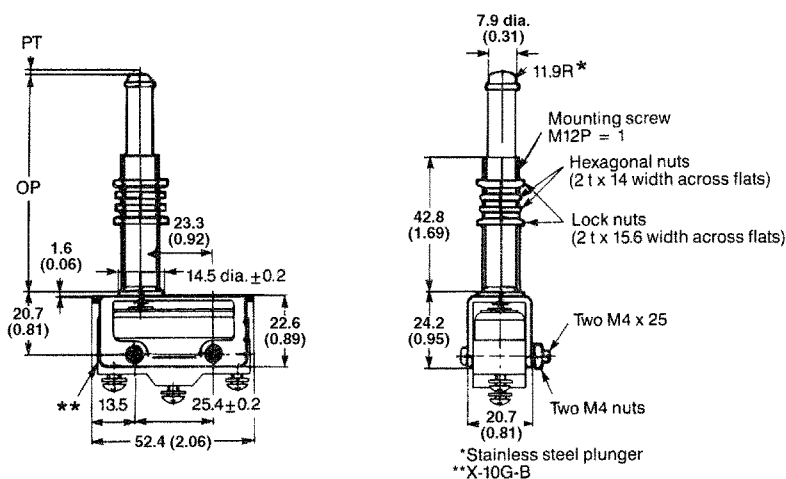
■ Panel Mount Plunger

ZAQ-2



■ Panel Mount Plunger

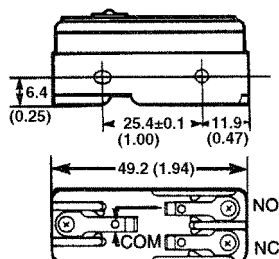
ZAQ-1



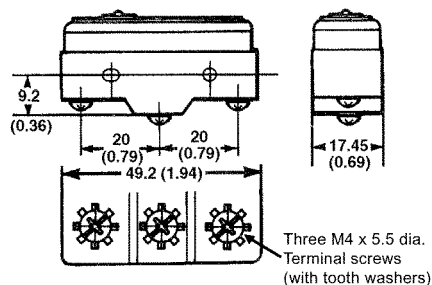
Note: 1. Unless otherwise specified, a tolerance of ± 0.8 mm applies to all dimensions.

■ Terminals

Solder terminal (blank)



Screw terminal (B)



Precautions

■ Handling

Use M4 screws in combination with plane washers or spring washers to securely mount the switch. Tighten the screws at a torque of 12 to 15 kg-cm.

When mounting the panel-mount model (the one having a suffix “-Q” in its model number) on a panel, tighten the hexagon nut of the actuator at a torque of 50 kg-cm maximum.

To solder the lead to the terminal, apply a soldering iron rated at 60 W max. quickly (within 5 seconds) with the actuator at the free position.

Note that applying a soldering iron for too long a time or using one that is rated at more than 60 W may degrade the switch characteristics.

Since the arc quenching capability of the magnetic blowout is governed by the amount of current to be switched, the arching time may not be uniform in the event of highly inductive loads with small currents. When the time constant L/R of 0.6 to 1.2 A loads exceeds 7 milliseconds, use of an arc suppressor circuit is required. As an example of arc suppressor circuit consisting of resistance R and capacitance C in series, obtain the optimum condition by combining R and C within the range of $R = 5$ to 100Ω and $C = 0.05$ to $1 \mu F$. Then connect the RC circuit between the switch terminals or load terminals so as to produce satisfactory results. (Consult OMRON for further details.)

Since the switch incorporates a permanent magnet, attention must be paid to the following points:

1. Avoid mounting the switch directly onto a magnetic substance.
2. Do not subject the switch to severe shocks.
3. Avoid placing the switch in a strong magnetic field.
4. Be sure to prevent iron dust or iron chips from adhering to the built-in magnet or the magnetic blowout function of the switch will be adversely affected.
5. Do not apply thermal shock to the switch, or the magnetic flux will be diminished.

■ Panel-mount Model (X-10G□)

To side-mount the panel-mount switch to the panel with screws, remove the hexagon nut from the actuator. In this case, exercise care that no impulsive force is applied to the actuator. Pay special attention to the impulsive force when the switch is to be released because such force may damage the switch.

Too large a dog angle and too fast operating speed may damage the switch when the switch is side-mounted on the panel.

Too fast operating speed and too long overtravel of the roller plunger switch may result in damage to the switch.

Omron Electronic Components, LLC

Terms and Conditions of Sales

I. GENERAL

- Definitions:** The words used herein are defined as follows.
 - Terms:** These terms and conditions
 - Seller:** Omron Electronic Components LLC and its subsidiaries
 - Buyer:** The buyer of Products, including any end user in section III through VI
 - Products:** Products and/or services of Seller
 - Including:** Including without limitation
- Offer/Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- Distributor:** Any distributor shall inform its customer of the contents after and including section III of these Terms.

II. SALES

- Prices/Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
- Discounts:** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest:** Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders:** Seller will accept no order less than 200 U.S. dollars net billing.
- Currencies:** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals:** Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes:** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
- Financial:** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
- Cancellation/Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- Force Majeure:** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
- Shipping/Delivery:** Unless otherwise expressly agreed in writing by Seller:
 - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
 - Delivery and shipping dates are estimates only; and
 - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier must be presented in detail in writing to Seller within 30 days of receipt of shipment.

III. PRECAUTIONS

- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
 - Outdoor use, use involving potential chemical contamination or electrical interference.
 - Use in consumer Products or any use in significant quantities.

- Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - Systems, machines, and equipment that could present a risk to life or property.
- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
 - Motorized Vehicle Application:** USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.
 - Programmable Products:** Seller shall not be responsible for the Buyer's programming of a programmable Product.

IV. WARRANTY AND LIMITATION

- Warranty:** Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER WARRANTIES, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS.
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