MJ1-6 Series

Heavy Duty Limit Switch

◆ Features

- ✓ Heavy duty aluminum limit switch
- ✓ Dust, water, and oil resistant on select models
- ✓ PF 1/2 inch threaded hole at side of switch
- ✓ Includes two M4 screws for side mounting

◆ Recognition(s)

- ✓ CE – EN60947
- ✓ UL – UL-508
- ✓ CCC – GB14048.5-2008
- ✓ RoHS Compliant
- ✓ Reach Unaffected

◆ Characteristics

Positive Opening	Electrical Contact	Terminal Type	Contact Form(s)	Poles & Throws	Actuation Sequence(s)
No	3 Points	Screw	Form C	SPDT	Break(1) Make(2)

Operating Temp.	AC Rated	DC Rated	IP	Oil Resist	Dust Resist	Water Resist	Operating Speed
-10 to 80 Celsius	15A 125-250V	0.5A 125V	60, 65	Yes & No	Yes	Yes & No	0.01mm to 1m/sec

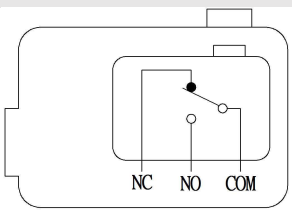
Operation Frequency	Contact Resistance	Insulation Resistance	Vibration
Mechanically: 240/min Electrically: 20/min	15mΩ max. (initial)	100MΩ min. (500VDC)	1.5mm amplitude at 10-55Hz

Storage Humidity	Service Life (min.)	Dielectric Strength
85% RH max	Mechanically: 20,000,000 operations Electrically: 500,000 operations	1000VAC, 50/60Hz for 1 minute between non-continuous terminals

Recommended tightening forces

Purpose	Screw type	Tightening
Mounting	M4	1.18~1.37 N·m
Enclosure cover		1.18±0.15 N·m
Screw terminal		0.25±0.05 N·m

Circuitry



◆ Materials

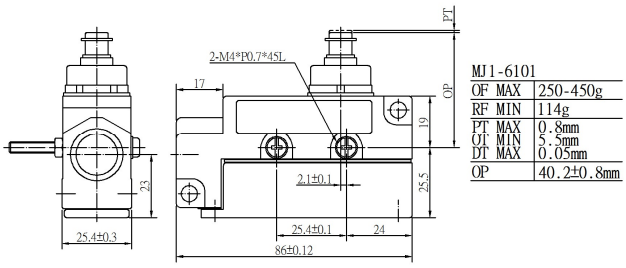
Actuation touch part	Electrical contact point	Enclosure
Stainless Steel	Silver 99.9%	Aluminum alloy

◆ Nomenclature

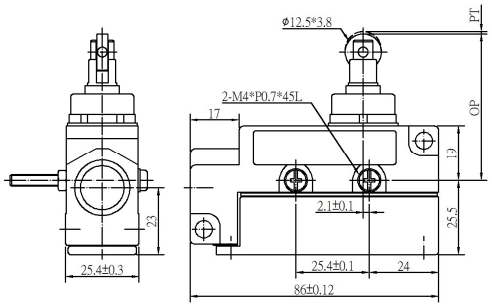
Series:	Actuator:	Through hole:
MJ1 –	**6101 –**	
	With-out actuator seal boot (IP60) 6101=Pin plunger 6102=Roller plunger 6102R=Cross roller plunger 6104=Arm lever, roller 6107=Arm lever, arm roller, 1-way action With actuator seal boot (IP65) 6111=Sealed pin plunger 6112=Sealed roller plunger 6112R=Sealed cross roller plunger 6114=Sealed arm lever, roller 6106=Sealed spring, coil 6117=Sealed arm lever, roller, 1-way action	*Blank*=PF1/2” thread M20=M20 thread (cable gland excluded)

◆ Dimensions & Operating Characteristics

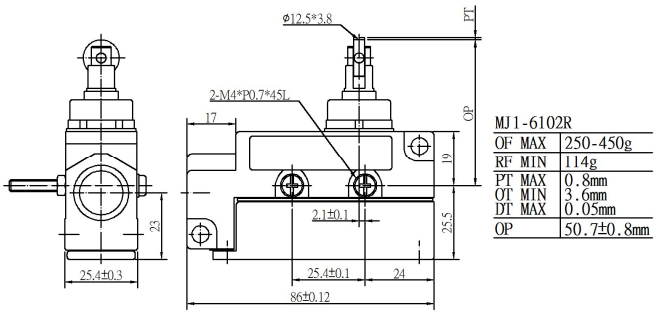
*Measurements in *millimeters*



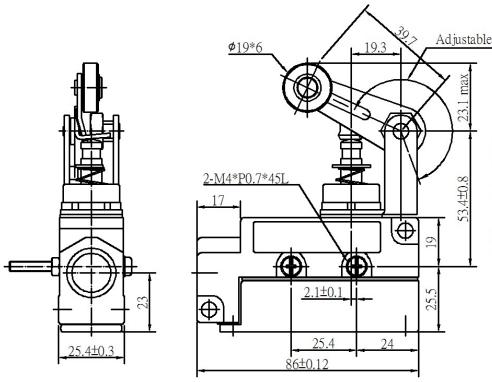
MJ1-6101	
OF MAX	250-450g
RF MIN	114g
PT MAX	0.8mm
OT MIN	5.5mm
DT MAX	0.05mm
OP	40.2±0.8mm



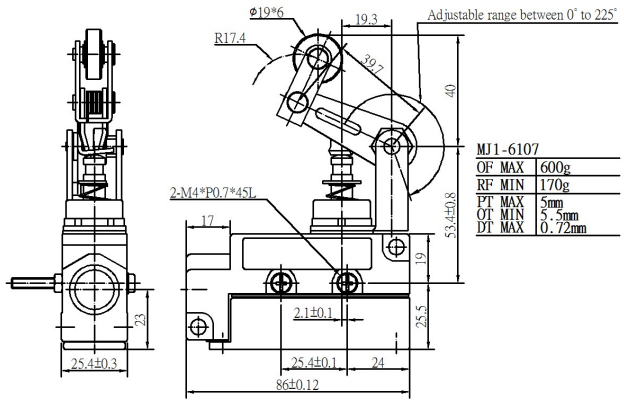
MJ1-6102	
OF MAX	250-450g
RF MIN	114g
PT MAX	0.8mm
OT MIN	3.6mm
DT MAX	0.05mm
OP	50.7±0.8mm



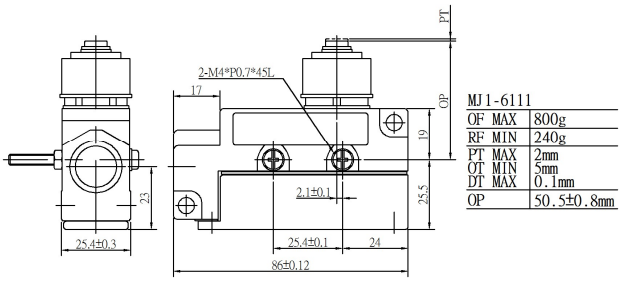
MJ1-6102R	
OF MAX	250-450g
RF MIN	114g
PT MAX	0.8mm
OT MIN	3.6mm
DT MAX	0.05mm
OP	50.7±0.8mm



MJ1-6104	
OF MAX	570g
RF MIN	170g
PT MAX	4mm
OT MIN	6mm
DT MAX	0.4mm



MJ1-6107	
OF MAX	600g
RF MIN	170g
PT MAX	5mm
OT MIN	5.5mm
DT MAX	0.72mm



MJ1-6111	
OF MAX	800g
RF MIN	240g
PT MAX	2mm
OT MIN	5mm
DT MAX	0.1mm
OP	50.5±0.8mm

MJ1-6101

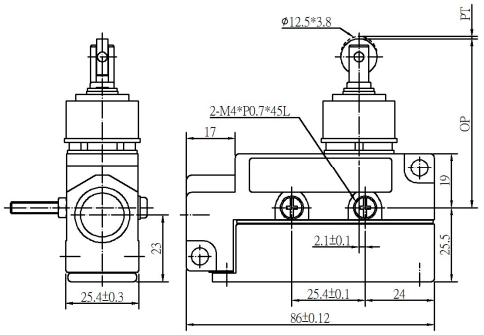
MJ1-6102

MJ1-6102R

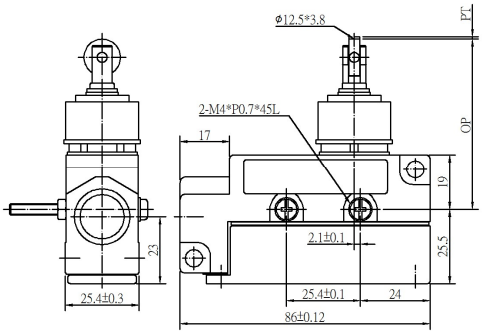
MJ1-6104

MJ1-6107

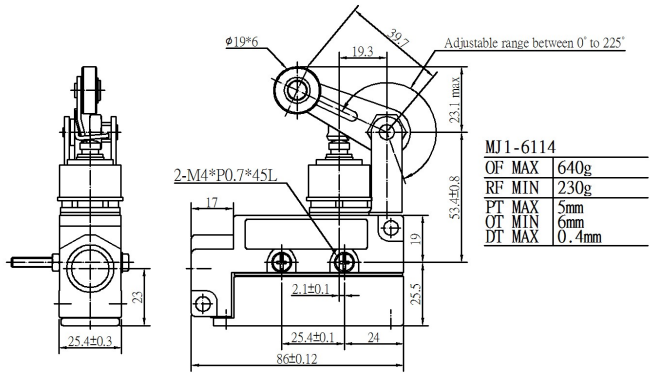
MJ1-6111



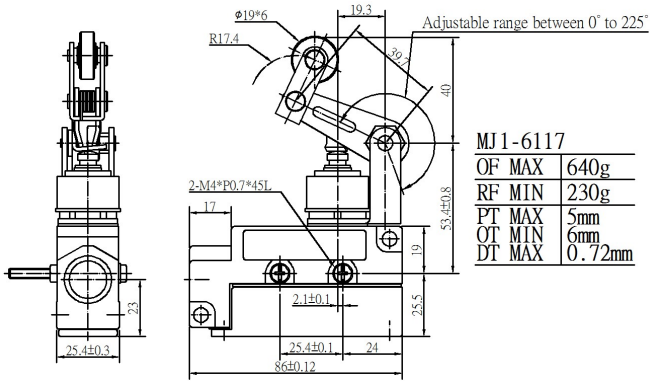
MJ1-6112	
OF MAX	500g
RF MIN	100g
PT MAX	2mm
OT MIN	3.5mm
DT MAX	0.12mm
OP	49.7±0.8mm



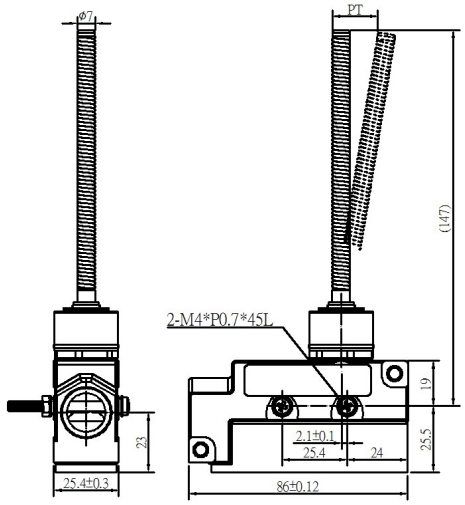
MJ1-6112R	
OF MAX	500g
RF MIN	100g
PT MAX	2mm
OT MIN	3.5mm
DT MAX	0.12mm
OP	49.7±0.8mm



MJ1-6114	
OF MAX	640g
RF MIN	230g
PT MAX	5mm
OT MIN	6mm
DT MAX	0.4mm



MJ1-6117	
OF MAX	640g
RF MIN	230g
PT MAX	5mm
OT MIN	6mm
DT MAX	0.72mm



MJ1-6106	
OF MAX	190g
PT MAX	2.6mm

MJ1-6112

MJ1-6112R

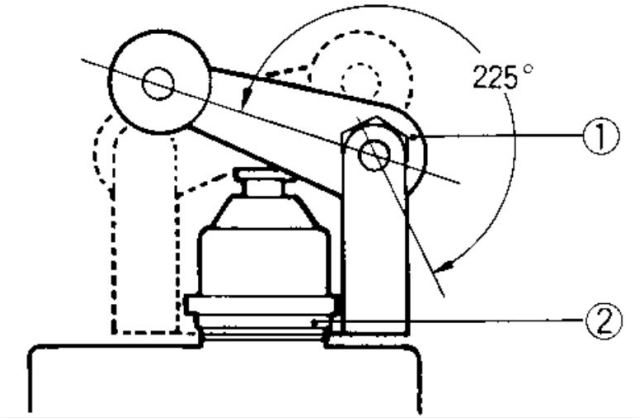
MJ1-6114

MJ1-6117

MJ1-6106

◆ Handling and Usage

Adjusting the arm lever roller:



1. The roller arm can be set freely within a range of 225° after loosening the nut.
2. The roller arm mounting bracket can be set in any direction after loosening the nut.

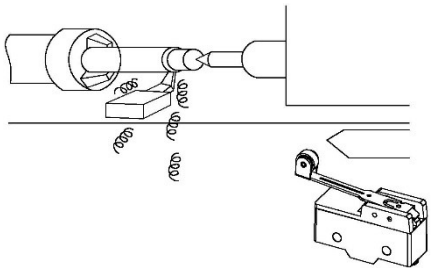
Precautions for Safe Use

• Be sure to ground. Otherwise electric shock may result.
• Do not touch charged switch terminals while the switch is carrying current, otherwise electric shock may result.
• Do not disassemble or touch the inside while the power is turned on, otherwise electric shock may result.
• Do not handle products without proper protective gears; doing so may result in injury.
• Connect a fuse which has 1.5 to 2 times higher breaking current than the product, in order to prevent products from short-circuit damage.
• On the occasion when using the switch with EN/IEC/GB ratings, use a 10 A fuse that complies IEC60269, either type gG or gL.
• Operating conditions will affect product durability. Be sure to check with actual using conditions before usage.
• Do not drop the switch.
• Do not connect a Single Limit Switch to two power supplies that are different in polarity or type. This may increase the risk of interference.
• Be sure to keep the load current less than the rated value. Otherwise, there is the possibility that the switch may be damaged and/or burnout.
• Do not use the Switch by itself in atmospheres containing flammable or explosive gases. Arcs and heat resulted from constant actuating may cause fire or explosion.
• Be sure to prevent foreign materials such as scrapped cable intrusion into the switch when wiring. Otherwise, there is the possibility of spoiling normal operations.
• Do not wire to the wrong terminals.
• Using the Switch in a pressed-in state for an extended period of time can accelerate part deterioration and also lead to failure to return to the original position. Check the Switch beforehand, and perform periodic inspection and replacement.
• Do not store or use the switch at the following places: (i)where the temperature fluctuates greatly. (ii)where the humidity is very high and condensation may occur. (iii)Where the vibration is great. (iv)Where there is direct sun light. (v)Where exposed to salty winds. (vi)Where exposed to cutting powder, machining chips, oil, and chemicals inside the protective doors. (vii)Where exposed to cleansers, thinners, and other solvents.
• Do not use or store the Switch in locations with corrosive gas, such as sulfuric gas (H_2S or SO_2), ammonium gas (NH_3), nitric gas (HNO_3), or chlorine gas (Cl_2), or high temperature and humidity. Otherwise, contact failure or corrosion damage may result.
• Do not disassemble and/or modify the switch at any time. Otherwise, there is the possibility of spoiling the normal operation.
• Do not apply deformative and/or degenerative forces to products.
• If products have been used over an extended period of time or uses stated in products datasheets, contact reliability may still degrade due to natural oxidation; resulting in inadequate conductivity, which may lead to an accident. Please swiftly preform inspections and insure proper replacements are carried out.
• Only allow certified professionals to preform installing and maintenance tasks.

Precautions for Correct Use

Operating Environment

• This switch is only for indoor use. If it is used in outdoor, it may cause switch failure.
• Take special care if products are to be used at places where there is fine powder, mud and/or foreign materials accumulating. Check actual using conditions before using. If this is unavoidable, highly recommend integrating protective equipment. This is considered not Moujen's obligations.
• Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods. This is considered not Moujen's obligations.
• Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.



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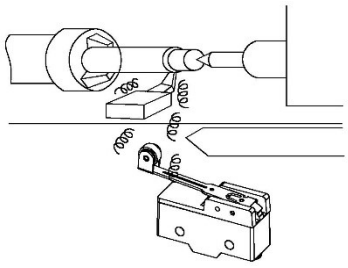


✕ Incorrect

• Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject to shock and vibration and in orientations that will not produce resonance.
• The Switches have physical contacts. Using them in environments containing silicon gas will result in the formation of silicon oxide (SiO_2) due to arc energy. If silicon oxide accumulates on the contacts, contact interference can occur. If silicon oil, silicon filling agents, silicon cables, or other silicon products are present near the Switch, suppress arcing with contact protective circuits (surge suppressor) or remove the source of silicon gas.
• If the Switch will be left in a location outside the storage environment conditions, if condensation has formed, or after long term storage exceeding one year, at the minimum, check the operating characteristics, contact resistance, insulation resistance, and dielectric strength. And conduct a check under the operating conditions.

Handling & Usage

• Do not remove or replace any built-in switches. Doing so may damage the product, resulting in increased risk of malfunctioning.
• Do not use excessive force to insert, remove or twist keys of key-selector products. Doing so may damage the product, resulting in increased risk of malfunctioning.
• Do not actuate products and hold its position for excessive amounts of time. Doing so will reduce the life of the internal spring as well as structural integrity; thus, increase risk of malfunctioning.
• Do not bend or twist cables with excessive force. When bending is required, provide a bending radius of 45 mm min. so as not to damage the cable insulation or sheath. Excessive bending may cause fire or leakage current.
• To change the installation position of the actuator: By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within 360°.
• To change the orientation of the head: By removing the head screws (two or four screws), mounting in any of four orientations is possible. Be sure to change the plunger for internal operations at the same time. The roller plunger can be set in either of two positions at 90°.
• Flipping the roller to a different side: Loosen the Allen-head bolt, allows flipping the roller to the opposite side.
• Adjusting the length of the rod or lever: The length of the rod or lever can be adjusted by loosening the Allen-head bolt.
• Adjusting the rolling arm lever: (i) The roller arm can be set freely within a range of 225° after loosening the nut. (ii) The roller arm mounting bracket can be set in any direction after loosening the nut.

Mounting and Tightening

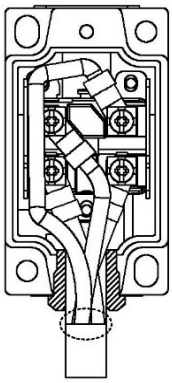
• Please view each individual product page's allowed parameters for details.
• Please follow these parameters diligently. Otherwise products may not function properly.

Wiring & Cabling

• Use M3.5-nylon insulation covered crimp terminals (round type)
• Appropriate wire size is AWG18.
• Do not supply electric power when wiring. Otherwise electric shock may result.
• Do not pull on the wires with excessive force.
• Avoid connecting the wires directly to the terminal. Instead, attach using a crimp terminal.
• Grounding is only installed on models with ground terminals.
• In the case of prewired connector and direct connector: Holding the connector certainly when pulling connector. Do not pull the cable with excessive force.

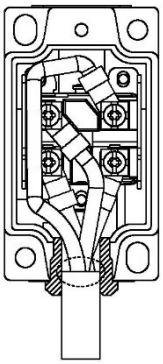
Conduit Installation

• The connector must be tightened at a suitable tightening torque. Tightening with excessive torque could damage the case.
• Select the connector based on the sealed rubber inner diameter for matching the cable outer diameter.
• When mounting the connector, use seal tape (not needed if the connector includes an O-ring) on the threaded section of the connector to ensure sealing performance.
• To ensure compliance of this Switch with the CSA standards, use of a waterproof connector compliant to CSA regulations.
• Using an inappropriate connector or assembling Switches incorrectly (assembly, tightening torque) can result in malfunction, leakage current, or fire. Be sure to read the connector instruction manual thoroughly beforehand.
• Even when the connector is assembled and set correctly, ends of the cable inside the Switch may come in contact. This can lead to malfunction, leakage current, or fire. Thus, be sure to protect the end of the cable from splashes of oil or water and corrosive gases.
• The following wiring is recommended for preventing the entry of fluids from the conduit opening.



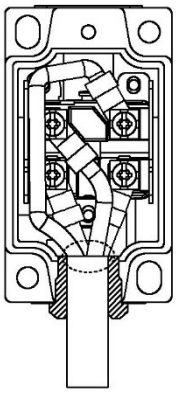
No envelopment of cable jacket in conduit. Exposed single wires.

✕ Incorrect



Partial/loose envelopment of cable jacket in conduit

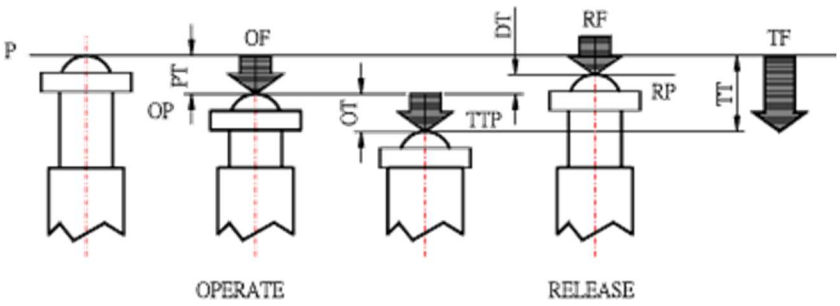
✕ Incorrect



Full envelopment of cable jacket in conduit.

✓ Correct

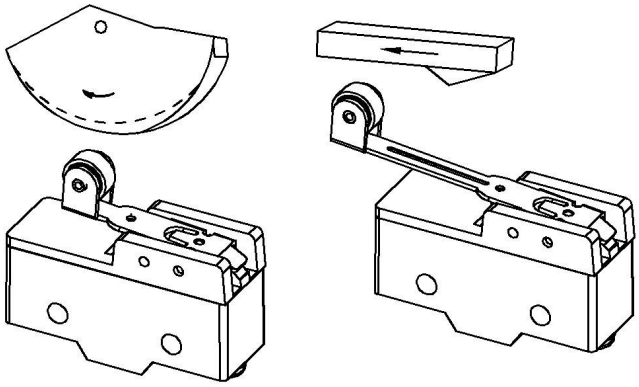
Actuating Terminology



OF: Operating Force	TTP: Total Travel Position
RF: Releasing Force	PT: Pretravel
TF: Total Force	OT: Overtravel
FP: Free Position	DT: Travel Differential
OP: Operating Position	TT: Total Travel
RP: Releasing Position	

Integrating into systems – Limit Switches

• Carefully determine the position and shape of the dog or cam so that the actuator will not abruptly snap back, thus causing shock. In order to operate the Limit Switch at a comparatively high speed, use a dog or cam that keeps the Limit Switch turned ON for a sufficient time so that the relay or valve will be sufficiently energized.
• The method of operation, the shape of the cam or dog, the operating frequency, and the travel after operation have a large influence on the durability and operating accuracy of the Limit Switch. The cam or dog must be smooth in shape.



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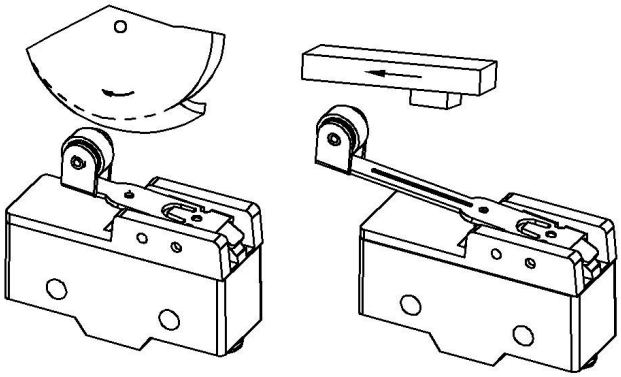

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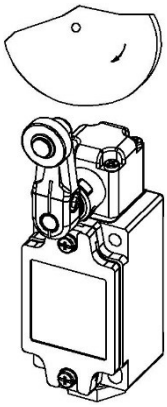

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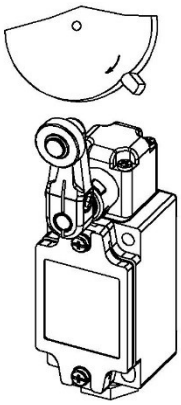

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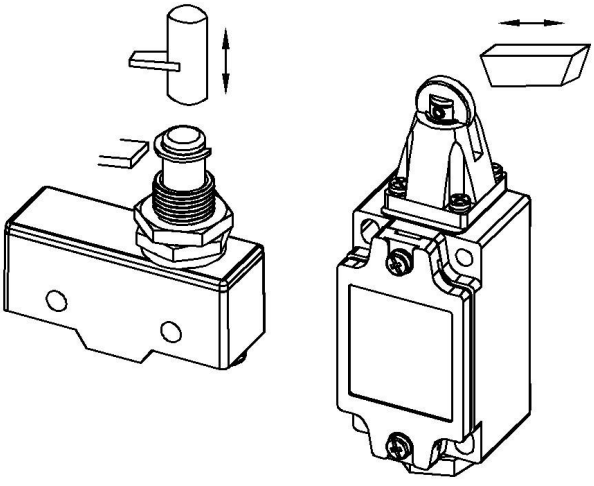

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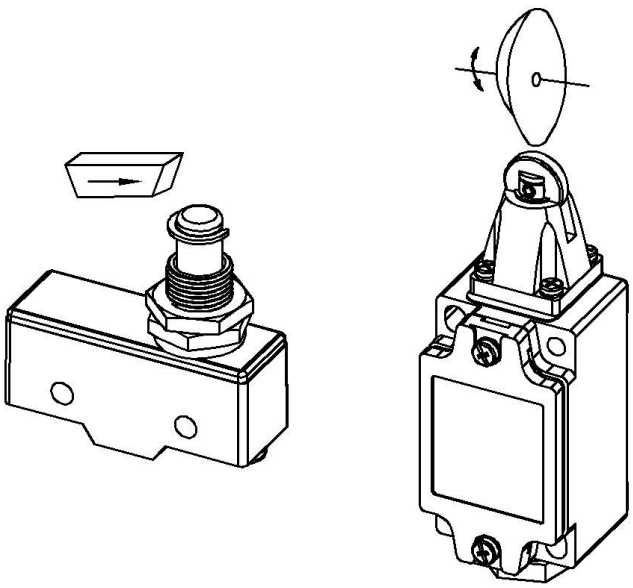

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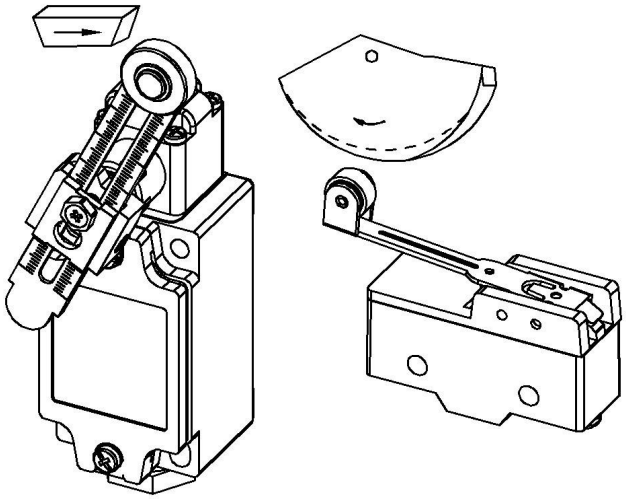

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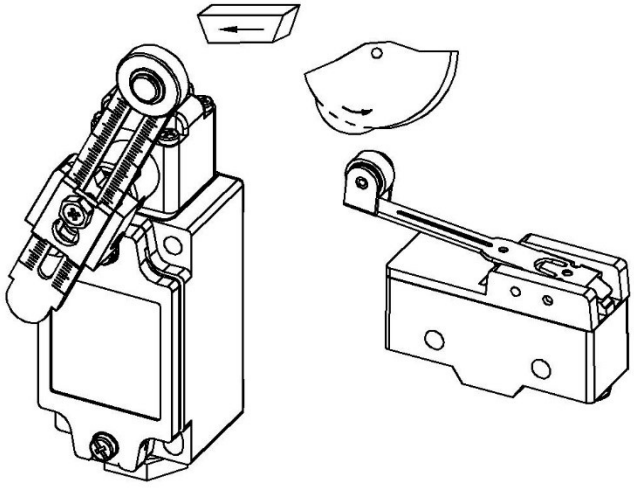
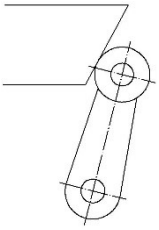


✕Incorrect

• Appropriate force must be imposed on the actuator by the cam or dog in both rotary operation and linear operation. If the dog touches the lever as shown below, the operating position will not be stable.



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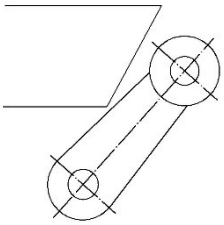
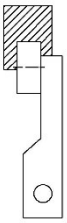


✕Incorrect

• Unbalanced force must not be imposed on the actuator. Otherwise, wear and tear on the actuator may result.



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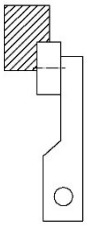
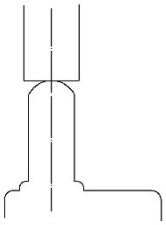
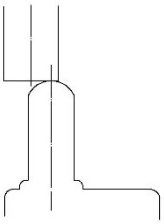


✕Incorrect

• Mount so that the actuator travel after operation (OT) is not exceeded. If the travel after operation (OT) exceeds the limit, switch failure could result. When mounting the Limit Switch, be sure to adjust the Limit Switch carefully while considering the whole movement of the actuator.
• When using a pin-plunger actuator, make sure that the stroke of the actuator and the movement of the dog are located along a single straight line.



✔Correct



✕Incorrect

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