

C Limit switch Micro switch

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Control
switch
Combination
display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

Buzzer
Terminal block
Fuse holder

Control box
Cable connector

Discontinued
Products



Summary of Limit switch and Micro switch

Terminology explanation

■ Micro switch

It has a small contact gap and snap action tool. Also the contact tools that open/close with the rated movement and rated force are covered with the case and have an actuator on the outside. This is a compact size switch.

■ Limit switch

Limit Switch is enclosed in a case to protect a built-in basic switch from the external force, water, oil, gas, and dust.

■ Rating

Value that insures the characteristic and function of limit switch

■ Operation part

Mechanical device part that operates the actuator of limit switch

■ Inverting spring

Inverting spring is mechanical parts that switch the contact of limit switch. Sometimes called as running spring

■ Detecting object

The object, product, part and etc that operate the limit switch other than mechanical device.

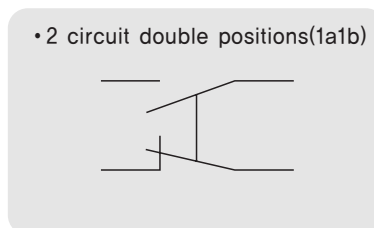
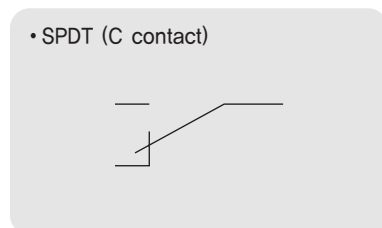
■ Actuator

The part of a switch that is subjected to an external force, transfers that force to an internal spring mechanism and moves contacts to perform switching. It is normally called as pushbutton or lever.

■ Contact composition

Depending on the various usages, it forms electrical input/output circuit of contact.

There are 2 types in the limit switch just like an image below.



Summary of Limit switch and micro switch

■ Mechanical life expectancy

Opening/closing life in the non electro state (After setting the rated value with the operation time)

■ Electrical life expectancy

Opening/closing life in the rated load (resistive load) (After setting the rated value with the operation time)

■ Operation characteristic

Definition of operation characteristic	Categories	Terminology	Symbol	Definition
	Force	Operating Force	O.F	Force that applied to the actuator in order to move from free position to the operation switch.
		Release Force	R.F	Force that applied to the actuator in order to move from operation limit position to the returning position
		Total travel Force	T.F	Force that applied to the actuator in order to move from operation position to the operation limit position.
	Movement	Pretravel	P.T	Travel distance or travel angle from free position of actuator to the operation position.
		Over travel	O.T	Travel distance or travel angle from operation position of actuator to the operation limit position.
		Movement Differential	M.D	Travel distance or travel angle from operation position of actuator to the returning position.
Total travel		T.T	Travel distance or travel angle from free position of actuator to the operation limit position.	
Position	Free Position	F.P	the position of actuator before applying force to the actuator from the outside	
	Operating Position	O.P	the position of actuator when running contact is accurately reversed in the free position state once external force is applied to the actuator.	
	Release Position	R.P	the position of actuator when running contact is accurately reversed from operation position state to the free position state by decreasing force applied to the actuator	
	Total travel Position	T.T.P	the position of actuator when actuator reaches the actuator stopper.	

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Terminal block
Fuse holder

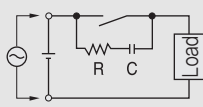
Control box
Cable connector

Discontinued Products

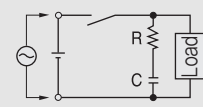
●● Precautions

■ Electrical precautions

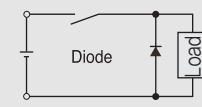
- In the inductive load opening / closing circuit, there are cases when contact impairment occurs within the contact due to the surge and inrush current. Therefore, we recommend inserting the protective circuit just like an image provided in the below for the contact protection.



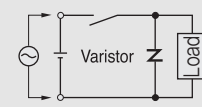
Usually applied when using d.c. R requires a lot of ohms. When using as an a.c, load capacity has to be small.
 R : 10 Ω ~ 100 Ω
 C : 0.05 ~ 0.1 μF



d.c and a.c both possible.
 R : 10 Ω
 C : 0.1 ~ 0.2 μF



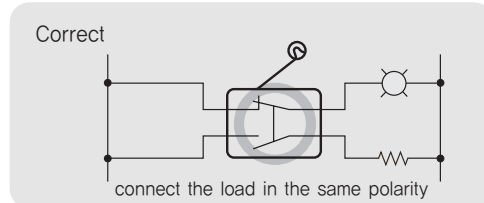
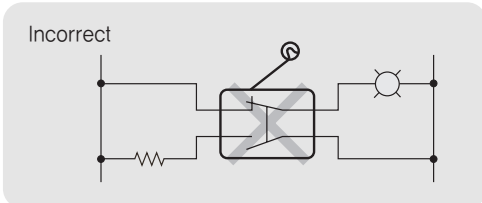
Only a.c is possible. Please select the diode that can withstand reverse internal pressure sufficiently.



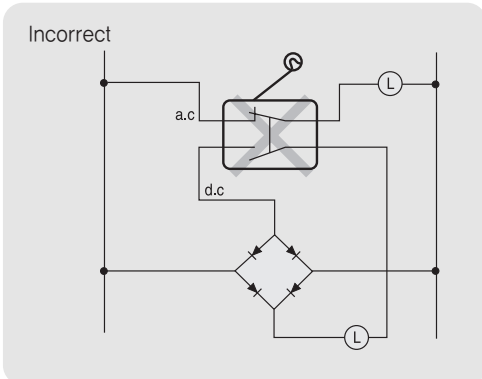
d.c and a.c both possible. Please select the Varistor 1.5 times bigger than power supply voltage.

- Please do not connect different polarities from each other and different power from each other. Please do not design the circuit where a difference of voltage exists between contacts, otherwise it may result the contact welding.

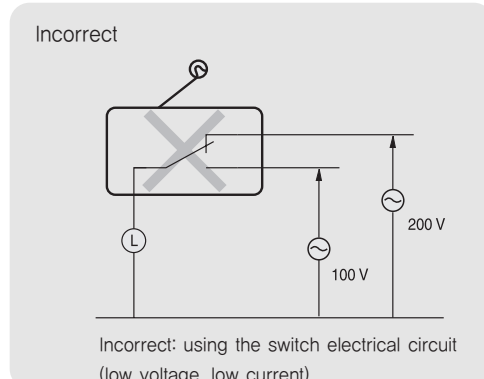
Connection of different polarities from each other



Connection of different power voltages from each other



Voltage trapped in between the contacts

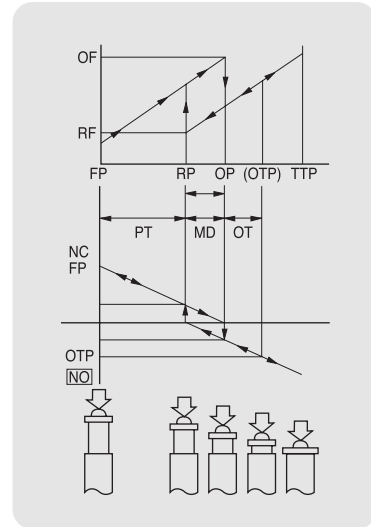


Summary of Limit switch and Micro switch

- If bouncing or chattering of the contacts results and causes problems, take the following countermeasures. Insert an integral circuit and suppress the generation of pulse from the contact bouncing or chattering of the contacts so that it is less than the noise margin of the load.

■ Mechanical precautions

- The following graph indicates the relationship between operating force and stroke or stroke and contact force. In order to operate the Limit Switch with high reliability, it is necessary to use the Limit Switch within an appropriate contact force range. If the Limit Switch is used in a normally closed condition, the dog must be installed so that the actuator will return to the FP when the actuator is actuated by the dog. If the Limit Switch is used in a normally open condition, press the actuator to roughly 70% to 100% of the value specified for the OT (i.e., 60% to 80% of the TT).
- If the full stroke is set close to the OP or RP, it may result the contact instability, and it may not be possible to maintain high reliability. Incorrect operation will be easily occurred due to the vibration or shock. If the full stroke is set to the TTP, the actuator or switch may be damaged due to the inertia of the dog. Therefore, adjust the stroke with the mounting panel or the dog.



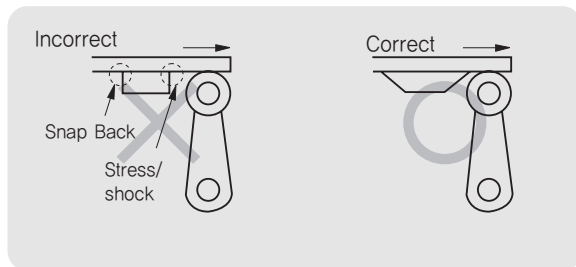
- The following graph shows an example of changes in contact force according to the stroke. The contact force near the OP or RP is unstable, and the Limit Switch cannot maintain high reliability. Furthermore, the Limit Switch cannot withstand the strong vibration or shock.

■ Precautions when selecting

- If the operating speed is extremely low, the switching of the movable contact will become unstable, thus it may result the incorrect contact or contact weld.
- If the operating speed is extremely high, the Switch may break due to shock. If the switching frequency is high, the switching of the contacts cannot catch up with the switching frequency.

■ Precautions with the operation

- 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 considering the shape.

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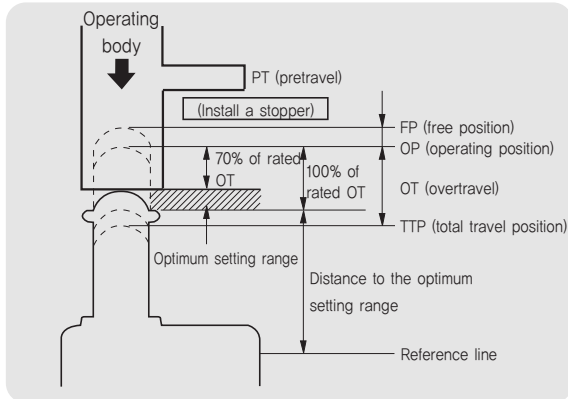
Sign tower
Signal light

Buzzer
Terminal block
Fuse holder

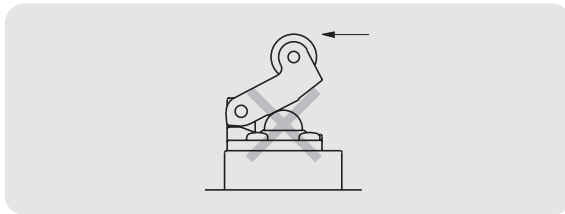
Control box
Cable connector

Discontinued
Products

- Make sure that the actuator does not exceed the OT (overtravel) range, otherwise the Limit Switch may result the malfunction occurrence. (Cam stroke OT: 70~100%) When mounting the Limit Switch, be sure to adjust the Limit Switch carefully while considering the total movement of the actuator.

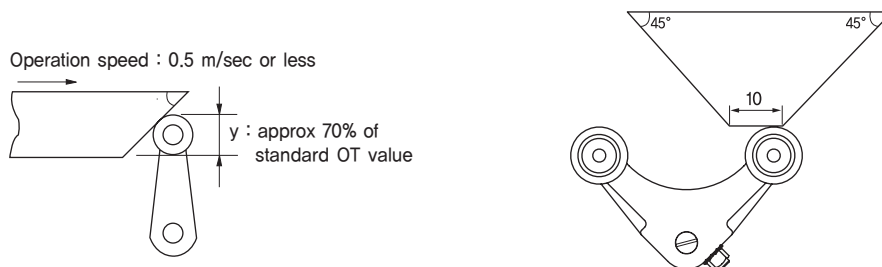


- Be sure to use the Limit Switch according to the characteristics of the actuator. If a roller arm lever actuator is used, do not attempt to actuate the Limit Switch in the direction shown in below.



🔗 Dog design

- Before designing a dog, carefully consider the operating speed and angle of the dog and their relationship with the shape of the actuator. The optimum operating speed (V) of a standard dog at an angle of 30° to 45° is 0.5 m/s maximum.



HY-M900 / HY-LM900 series

Limit switch

- Solid die casting case and built in the 2 circuits double micro switch
- High mechanical intensity with the heat resistance, oil proof and dust protection structure
- Various actuators (8 types) provide wide application
- IP67 protective structure (when using the company product HYC-M1 in wire opening)
- Check the operation state on the outside by attaching the operation indicator.



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Control box
Cable connector

Discontinued
Products

●● Suffix code

Model	Code	Description
HY-M90	<input type="checkbox"/> <input type="checkbox"/>	Limit switch (No operation indicator)
HY-LM90	<input type="checkbox"/> <input type="checkbox"/>	Limit switch (Operation indicator attachment type)
Actuator (operation part)	2	Roller Plunger Type
	3	Ball Plunger Type
	4	Roller Adjustable Lever Type
	7	Adjustable Rod Wire Type
	8	Roller Lever Type
	8L	Fork Roller Lever
	8R	Ø50 Roller Lever Type
	9	Coil Spring Type
Operation indicator classification (HY-LM90□□)		No operation indicator
	A	a.c indicator attachment type
	D	d.c indicator attachment type

●● Operation indicator attachment type classification

- M900 series limit switch is generally composed of the product with operation indicator and without operation indicator. Also divided into the a.c type and d.c type operation indicator.
- It can be used as an operation indicator just by changing the cover of limit switch. It does not need the separate connection and it selects ON/OFF by rotating the holder 180 degree.

Voltage	a.c operation indicator (250 V a.c)	d.c operation indicator (24 V d.c)
Model	HY-LM90□A (a.c)	HY-LM90□D (d.c)
Indicator type	Neon lamp	L,E,D
Leakage current	approx 1.2 mA (250 V a.c)	approx 1.0 mA (24 V d.c)

●● Ratings

Rated voltage		Rated electro current (A)			
		Resistive load	Inductive load	electric motor load	
				N.C	N.O
a.c	125 V	15	10	3	1.5
	250 V	10	6	2	1
	480 V	3	2	1.5	0.75
d.c	8 V	15	10	–	–
	14 V	15	10	–	–
	30 V	6	5	–	–
	125 V	0.4	0.05	–	–
	250 V	0.2	0.03	–	–

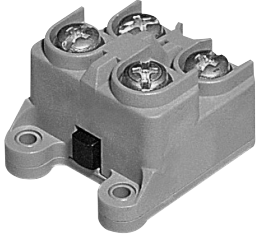
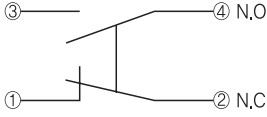
※ In case of electric magnetic coil and incandescent lamp load then it is same as the electric motor load.

●● Specification

Contact structure	M4 screw tightening terminal, 2 circuits double type (1a1b)	
Contact material	AgNi	
Protective structure	IP67 (Only when using our company product HYC-M2 in the wire opening)	
Operation indicator	a.c : Neon lamp, d.c : LED (only with the HY-LM series)	
Rated current(Ie)	6 A 250 V a.c (AC-15, DC-13)	
Dielectric strength	2,000 V a.c 50/60 Hz for 1 min (between the terminal and non-recharging metal part)	
Insulation resistance	Min 100 M Ω (500 V d.c insulated ohmmeter)	
Contact resistance	Max 50 M Ω (default value)	
Rated voltage(Ue)	250 V a.c, 30 V d.c	
Actuator intensity	5 times larger than O.F (force required to operate) 1min to the, operating direction	
Vibration	Double amplitude 1.5mm, frequency 10 ~ 55 Hz, continuously 2 hour	
Shock	1,000 % g (durability), 300 % g (malfunction)	
Allowable operation speed	0.1 ~ 1 % s (without damaging the actuator)	
Life expectancy	Mechanical	Min 1million times (open/close frequency 120 times/min)
	Electrical	Min 300 thousand times (open/close frequency 20 times/min)
Ambient temperature	-10 ~ 70 $^{\circ}\text{C}$	
Ambient humidity	45 ~ 95 % R.H.	
Weight	Approx 350 g (included the box with HY-M904)	

HY-M900/HY-LM900 series



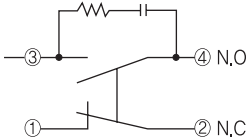
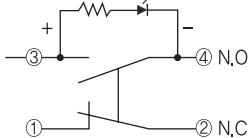
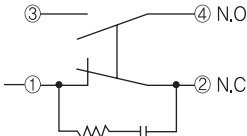
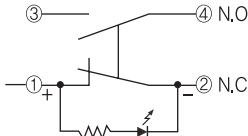
●● Built in type micro switch

Appearance (LS-10)	Connection diagram
	

Control switch
Combination display light

Power switch
Main switch
Cam switch

●● Cover for operation indicator and internal connection diagram

a.c	d.c
	
<p>L,ON when Normal close (default)</p> 	<p>L,ON when Normal close (default)</p> 
<p>L,ON when Push</p> 	<p>L,ON when Push</p> 

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

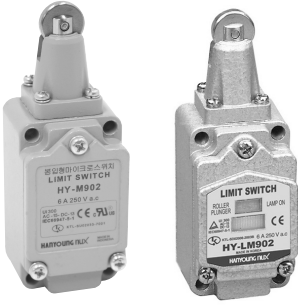
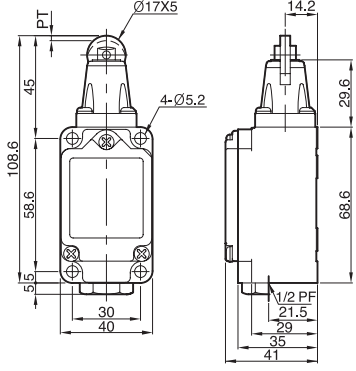
Buzzer
Terminal block
Fuse holder

Control box
Cable connector


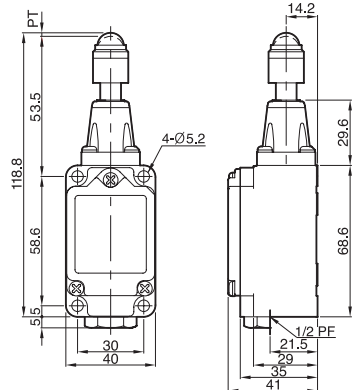
Discontinued Products

Dimension (unit : mm)


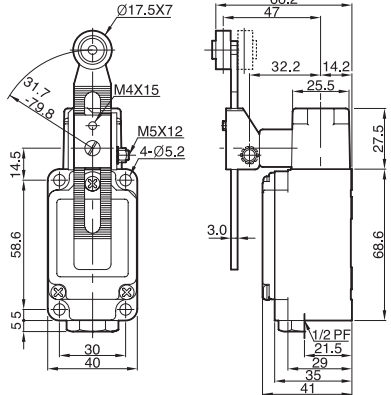
■ Roller Plunger

Appearance	Dimension	Operation characteristic
 <p data-bbox="229 755 322 780">HY-M902</p> <p data-bbox="398 755 501 780">HY-LM902</p>		<p data-bbox="1005 517 1215 542">O.F max : 28 N (2857 gf)</p> <p data-bbox="1005 556 1215 581">R.F min : 8 N (816 gf)</p> <p data-bbox="1005 595 1115 620">P.T : 2.0 mm</p> <p data-bbox="1005 633 1165 658">M.D max : 1.0 mm</p>

■ Ball Plunger


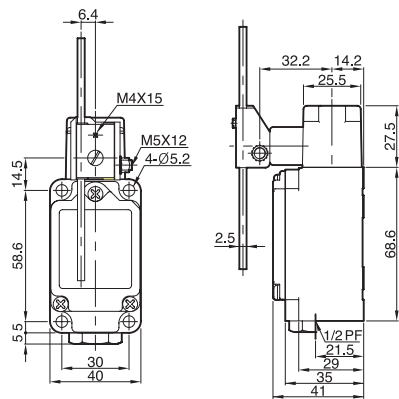
Appearance	Dimension	Operation characteristic
 <p data-bbox="229 1261 322 1286">HY-M903</p> <p data-bbox="398 1261 501 1286">HY-LM903</p>		<p data-bbox="1005 1020 1215 1045">O.F max : 28 N (2857 gf)</p> <p data-bbox="1005 1058 1205 1083">R.F min : 8 N (816 gf)</p> <p data-bbox="1005 1097 1115 1122">P.T : 2.0 mm</p> <p data-bbox="1005 1136 1165 1161">M.D max : 1.0 mm</p>

■ Roller Adjustable Lever


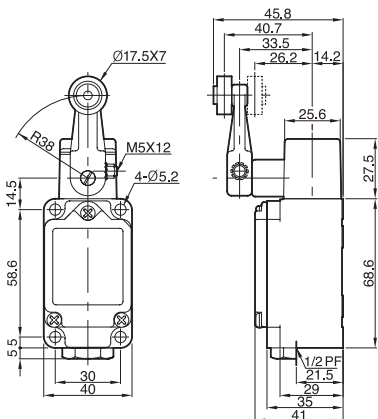
Appearance	Dimension	Operation characteristic
 <p data-bbox="229 1771 322 1796">HY-M904</p> <p data-bbox="398 1771 501 1796">HY-LM904</p>		<p data-bbox="1005 1516 1215 1541">O.F max : 14 N (1428 gf)</p> <p data-bbox="1005 1555 1215 1580">R.F min : 2.1 N (214 gf)</p> <p data-bbox="1005 1593 1129 1619">P.T : 15° ±5°</p> <p data-bbox="1005 1632 1129 1657">M.D max : 12°</p> <p data-bbox="1005 1671 1086 1696">T.T : 40°</p>

HY-M900/HY-LM900 series


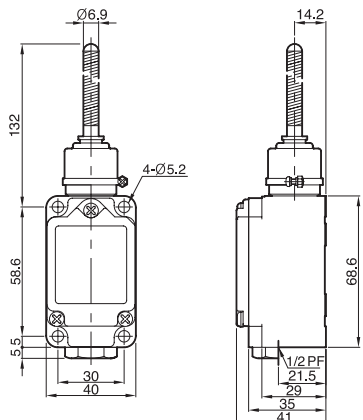
■ Rod Lever

Appearance	Dimension	Operation characteristic
 <p>HY-M907 HY-LM907</p>		<p>O.F max : 1.5 N (153 gf) R.F min: 0.25 N (25 gf) P.T : 15° ±5° M.D max : 12° T.T : 40°</p>

■ Roller Lever

Appearance	Dimension	Operation characteristic
 <p>HY-M908 HY-LM908</p>		<p>O.F max : 14 N (1428 gf) R.F min: 2.1 N (214 gf) P.T : 15° ±5° M.D max : 12° T.T : 40°</p>

■ Coil Spring

Appearance	Dimension	Operation characteristic
 <p>HY-M909 HY-LM909</p>		<p>O.F max : 1.5 N (153 gf) P.T : 20.0 ±10.0 mm</p>

Control switch
Combination display light

Power switch
Cam switch

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch


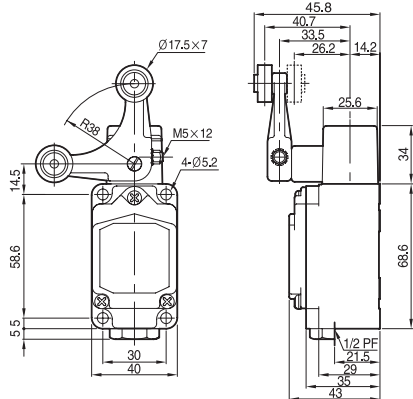
Sign tower
Signal light

Buzzer
Terminal block
Fuse holder


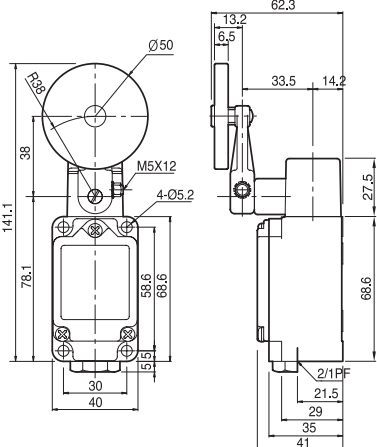
Control box
Cable connector

Discontinued Products

■ Fork Roller Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="268 691 371 718">HY-M908L</p>		<p data-bbox="1006 454 1220 483">O.F max : 11.8N(1200gf)</p> <p data-bbox="1006 492 1135 521">P.T : 50° ±5°</p> <p data-bbox="1006 531 1135 560">O.T max : 12°</p> <p data-bbox="1006 569 1135 598">T.T : 90° ±5°</p>

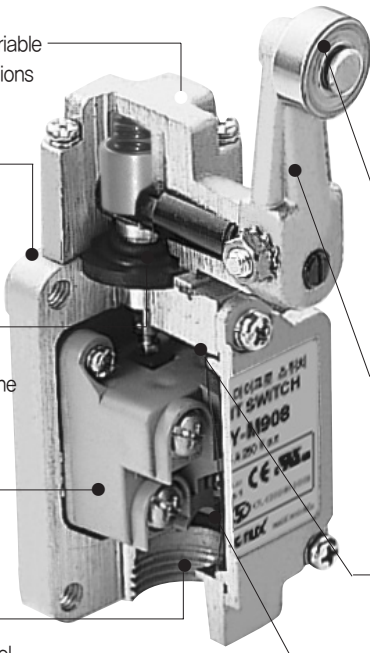
■ Ø50 Roller Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="268 1265 371 1292">HY-M908R</p>		<p data-bbox="1006 985 1213 1014">O.F max : 14 N (1428 gf)</p> <p data-bbox="1006 1023 1192 1052">R.F min: 2.1 N (214 gf)</p> <p data-bbox="1006 1062 1120 1091">P.T : 15° ±5°</p> <p data-bbox="1006 1101 1120 1130">M.D max : 12°</p> <p data-bbox="1006 1139 1078 1168">T.T : 40°</p>

HY-M900/HY-LM900 series

Structure

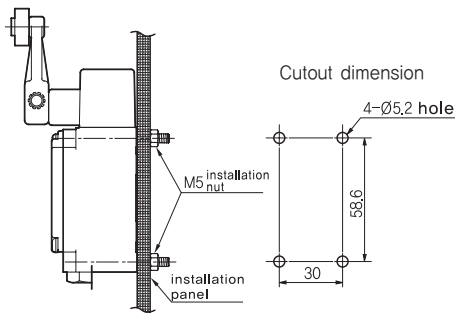
- **Head** : Al die casting roller lever type, variable roller lever type : Attach in any of 4 directions by unloosening 4 screws.
- **Case** : Al die casting, high mechanical durability and has a heat resistance, oil-proof and dust protective structure.
- **Plunger** : Accurate manufacturing which provides excellent reciprocating motion. It makes the operation of built-in switch very smooth.
- **MICRO S/W** : long mechanical life expectancy
- **Wire opening** : Connector screw is PF 1/2 common parallel screw. When using it with our company connector (M1 and M2) then it will be sealed more tightly.



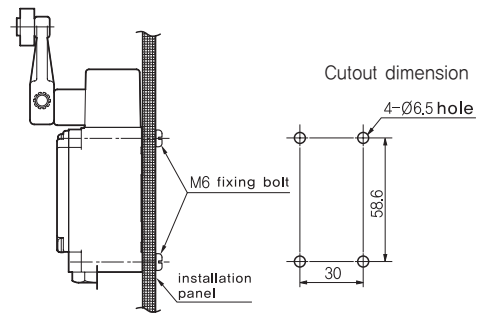
- **Roller** : Excellent hardness and abrasion resistance
- **Lever** : Al die-casting (M908) variable roller lever type, variable rod type and roller lever type can set the lever position within any position (360 degree)
- **Cover Seal** : O ring. It tightens the cover properly which helps it to seal the area
- **Insulating paper** : Excellent insulation

Installation method

■ Front installation



■ Back installation



- Control switch
- Combination display light
- Power switch
- Main switch
- Cam switch
- Limit switch
- Micro switch
- Hoist switch
- Foot switch
- Mono lever switch
- Sign tower
- Signal light
- Buzzer
- Terminal block
- Fuse holder
- Control box
- Cable connector
- Discontinued Products

HY-LS800 series

Limit switch

- Compact size and light weight
by applying the plastic case
- Plastic case which provides safety regarding
the electric leakage
- Various actuators (6 types) provide wide
application
- IP54 protective structure
(Applied only when using our company
connector model HYC-M1 in the wire opening)
- Connector rating of wire opening : 1/2 PF


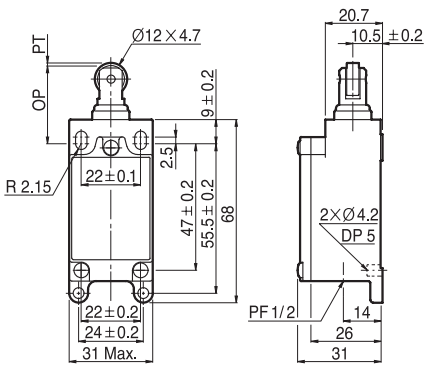


●● Specification


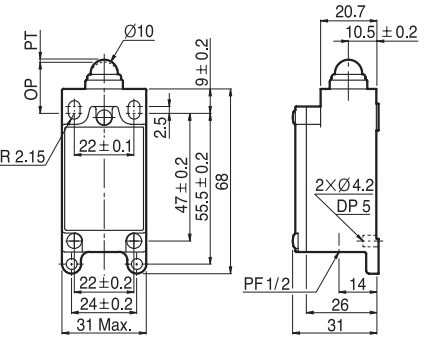
Contact structure	M3 screw tightening terminal, 2 circuits double type (1a1b)	
Contact material	AgNi	
Protective structure	IP54 (Only when using our company product HYC-M1, M2 in the wire opening)	
Rated current(Ie)	6 A 250 V a.c, 4 A 30 V d.c (AC-12, AC-13, AC-15, DC-13)	
Dielectric strength	2,000 V a.c 50/60 Hz for 1 min (between the terminal and non-recharging metal part)	
Insulation resistance	Min 100 M Ω (500 V d.c insulated ohmmeter)	
Contact resistance	Max 25 M Ω (default value)	
Rated voltage(Ue)	250 V a.c, 30 V d.c	
Actuator intensity	5 times larger than O.F (required force for the operation), operating direction 1 min	
Vibration	Double amplitude 1.5mm, frequency 10 ~ 55 Hz, continuously 2 hour	
Shock	100 % (durability), 50 % (malfunction)	
Allowable operation speed	0.1 ~ 0.5 % (without damaging the actuator)	
Life expectancy	Mechanical	Min 1 million times (less than open/close frequency 120 times/min)
	Electrical	Min 100 thousand times (less than open/close frequency 30 times/min)
Ambient temperature	-10 ~ 70 °C	
Ambient humidity	45 ~ 95 % R.H.	
Weight	Approx 60g (HY-LS803N)	

Dimension (unit : mm)


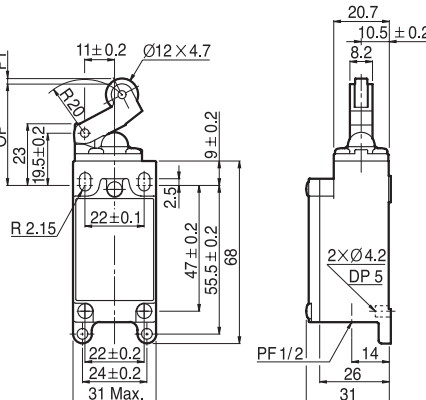
■ Roller Plunger

Appearance	Dimension	Operation characteristic
 <p>HY-LS802N</p>		<p>O.F max : 6.37 N (650 gf) R.F min : 1.47 N (150 gf) P.T max : 2.0 mm O.T min : 4.0 mm M.D max : 0.8 mm O.P : 28.2 ±0.8</p>

■ Push Plunger

Appearance	Dimension	Operation characteristic
 <p>HY-LS803N</p>		<p>O.F max : 6.37 N (650 gf) R.F min : 1.47 N (150 gf) P.T max : 2.0 mm O.T min : 4.0 mm M.D max : 0.8 mm O.P : 18.0 ±0.5</p>

■ Roller Arm


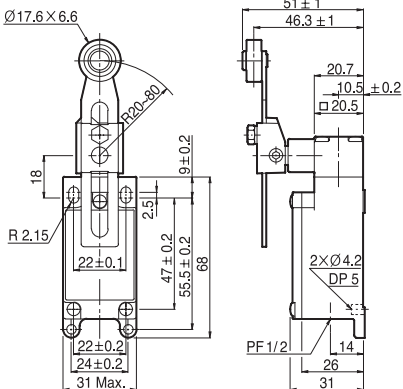
Appearance	Dimension	Operation characteristic
 <p>HY-LS803RN</p>		<p>O.F max : 3.92 N (400 gf) R.F min : 0.78 N (80 gf) P.T max : 4.0 mm O.T min : 5.0 mm M.D max : 1.5 mm O.P : 37.0 ±0.8</p>

- Control switch
- Combination display light
- Power switch
- Main switch
- Cam switch
- Limit switch
- Micro switch


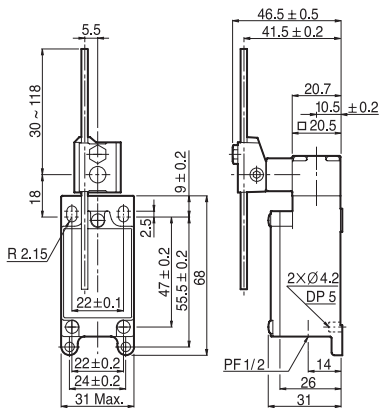
- Hoist switch
- Foot switch
- Mono lever switch
- Sign tower
- Signal light
- Buzzer
- Terminal block
- Fuse holder

- Control box
- Cable connector
- Discontinued Products


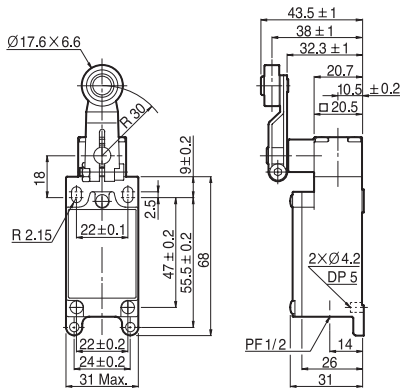
■ Roller Adjustable Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="244 697 362 726">HY-LS804N</p>	 <p>Technical drawing showing dimensions for the roller adjustable lever. Key dimensions include: roller diameter $\varnothing 17.6 \times 6.6$, roller radius $R20 \sim 30$, mounting hole offset 18, roller offset 9 ± 0.2, roller height 2.5, roller width 22 ± 0.1, roller depth 47 ± 0.2, roller length 55.5 ± 0.2, roller total length 68, roller bottom hole offset 22 ± 0.2, roller bottom hole offset 24 ± 0.2, roller bottom hole offset 31 Max., roller radius $R2.15$, roller offset 51 ± 1, roller offset 46.3 ± 1, roller offset 20.7, roller offset 10.5 ± 0.2, roller offset $\square 20.5$, roller offset $2 \times \varnothing 4.2$, roller offset $DP 5$, roller offset $PF 1/2$, roller offset 14, roller offset 26, roller offset 31.</p>	<p>O.F max : 4.21 N (430 gf) R.F min : 0.42 N (43 gf) P.T max : 18° ~ 27° O.T min : 30° M.D max : 14°</p>

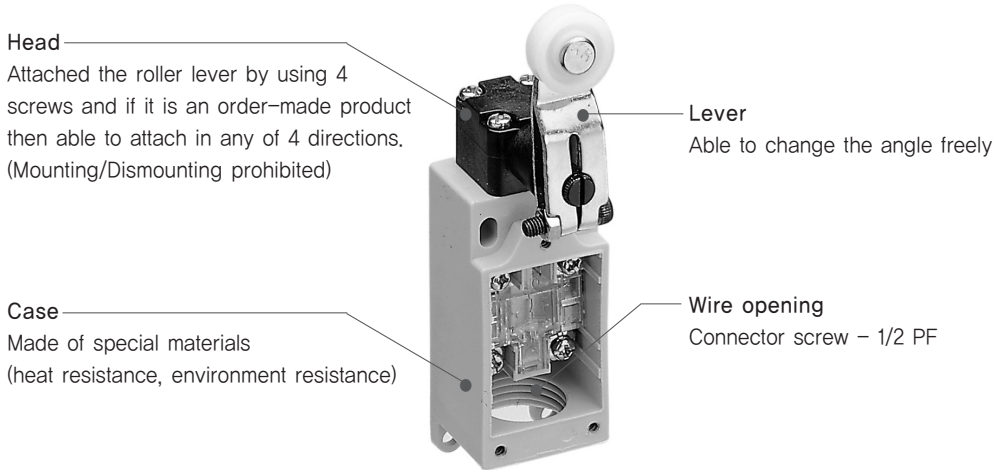
■ Adjustable Rod Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="244 1232 362 1261">HY-LS807N</p>	 <p>Technical drawing showing dimensions for the adjustable rod lever. Key dimensions include: rod diameter 5.5, rod length $30 \sim 118$, mounting hole offset 18, roller offset 9 ± 0.2, roller height 2.5, roller width 22 ± 0.1, roller depth 47 ± 0.2, roller length 55.5 ± 0.2, roller total length 68, roller bottom hole offset 22 ± 0.2, roller bottom hole offset 24 ± 0.2, roller bottom hole offset 31 Max., roller radius $R2.15$, roller offset 46.5 ± 0.5, roller offset 41.5 ± 0.2, roller offset 20.7, roller offset 10.5 ± 0.2, roller offset $\square 20.5$, roller offset $2 \times \varnothing 4.2$, roller offset $DP 5$, roller offset $PF 1/2$, roller offset 14, roller offset 26, roller offset 31.</p>	<p>O.F max : 4.21 N (430 gf) R.F min : 0.42 N (43 gf) P.T max : 18° ~ 27° O.T min : 30° M.D max : 14°</p>

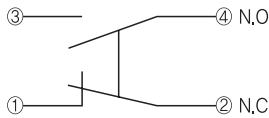
■ Roller Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="244 1748 362 1777">HY-LS808N</p>	 <p>Technical drawing showing dimensions for the roller lever. Key dimensions include: roller diameter $\varnothing 17.6 \times 6.6$, roller radius $R30$, mounting hole offset 18, roller offset 9 ± 0.2, roller height 2.5, roller width 22 ± 0.1, roller depth 47 ± 0.2, roller length 55.5 ± 0.2, roller total length 68, roller bottom hole offset 22 ± 0.2, roller bottom hole offset 24 ± 0.2, roller bottom hole offset 31 Max., roller radius $R2.15$, roller offset 43.5 ± 1, roller offset 38 ± 1, roller offset 32.3 ± 1, roller offset 20.7, roller offset 10.5 ± 0.2, roller offset $\square 20.5$, roller offset $2 \times \varnothing 4.2$, roller offset $DP 5$, roller offset $PF 1/2$, roller offset 14, roller offset 26, roller offset 31.</p>	<p>O.F max : 4.9 N (500 gf) R.F min : 0.49 N (50 gf) P.T max : 18° ~ 27° O.T min : 30° M.D max : 14°</p>

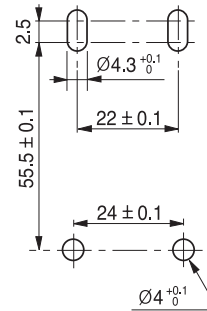
●● Structure



●● Switch connection diagram (external case one body type)

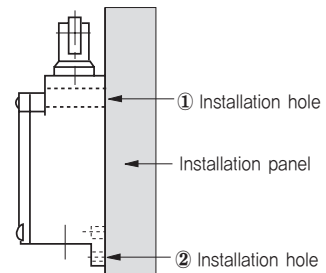


●● Panel cutout (unit : mm)



●● Proper using instruction

- In order to prevent the looseness when it is mounted, it is ok to use washer and mount it with 5 ~ 7 N · m torque.
- There are 2 installing holes (Ø4 ~ 4.8) in order to mount the switch solidly and when mounting it, please fix it with the installing holes ① and ②.
- Please connect the lead wire to the terminal directly or connect the pressing terminal with the 5~6 N · m torque.
- Avoid the places where temperature is high, various kinds of dust exist and possible leakage of organic gas.
- Please ask us if you are going to use it in the place where it needs the corrosiveness cold/hot cycle and long period hot resistance.
- Please ask us if you are going to change the direction of head (LS803RN, LS804N, LS807N, LS808N)



Control switch
Combination display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

Buzzer
Terminal block
Fuse holder

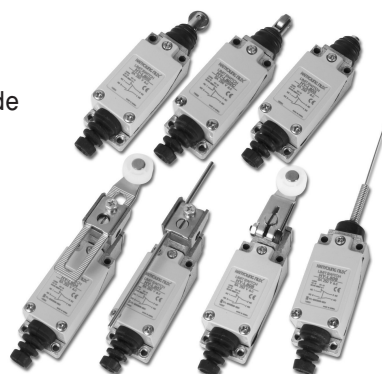
Control box
Cable connector

Discontinued Products

HY-L800 series

Mini limit switch

- Less installation space due to the compact size
- Zinc die-casting body and plastic cover structure provide electrical safeties
- 4 types of actuators provide wide usages
- Able to install at the front side and back side
- Simple connecting because when open the cover, the terminal part is exposed to the front side.
- Applied to the machine tools, transportation machine, assembling line and various industrial machines



●● Suffix code

Model	Code	Description
HY-L80	□	Compact limit switch (HY-L800 series)
Actuator (operation part)	2	Roller Plunger type
	2C	Cross Roller Plunger type
	3	Top Plunger type
	4	Roller Adjustable Lever type
	7	Adjustable Rod Lever type
	8	Roller Lever type
	9	Coil Spring type


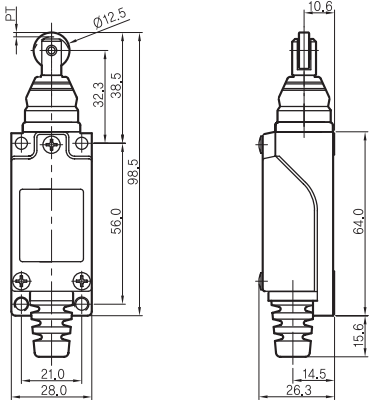
●● Specification

Contact structure	M3 screw tightening terminal, 2 circuits double type (1a1b)	
Contact material	AgNi	
Protective structure	IP 54	
Rated current(Ie)	6 A 250 V a.c (AC-12, AC-13)	
Dielectric strength	2,000 V a.c 50/60 Hz for 1 min (between the terminal and non-recharging metal part)	
Insulation resistance	Min 100 M Ω (500 V d.c insulated ohmmeter)	
Contact resistance	Max 20 M Ω (default value)	
Rated voltage(Ue)	250 V a.c	
Case material	Zinc die-casting and plastic body and plastic cover	
Vibration	Double amplitude 1.5 mm, frequency 10 ~ 55 Hz, continuously 2 hour	
Shock	300 % g (durability), 100 % g (malfunction)	
Max opening/closing frequency	Max 120 times / min	
Life expectancy	Mechanical	Min 1 million times (less than open / close frequency 120 times/min)
	Electrical	Min 100 thousand times (less than open / close frequency 30 times/min)
Ambient temperature	-10 ~ 70 °C	
Ambient humidity	45 ~ 95 % R.H.	
Weight	Approx 157g (HY-LS804 standard)	

HY-L800 series

Dimension (unit : mm)

■ Roller Plunger type


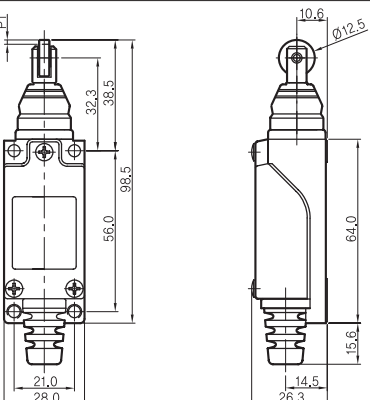
Appearance	Dimension	Operation characteristic
 <p>HY-L802</p>		<p>O.F max : 8.83 N (900 gf) R.F min : 1.47 N (150 gf) P.T max : 1.5 mm O.T min : 2.5 mm M.D max : 0.8 mm TTP : 3.5 mm</p>

Control switch
Combination display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

■ Cross Roller Plunger type


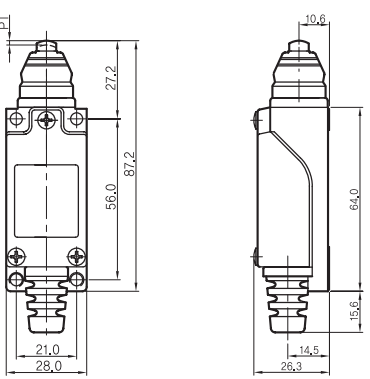
Appearance	Dimension	Operation characteristic
 <p>HY-L802C</p>		<p>O.F max : 8.83 N (900 gf) R.F min : 1.47 N (150 gf) P.T max : 1.5 mm O.T min : 2.5 mm M.D max : 0.8 mm TTP : 3.5 mm</p>

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

Buzzer
Terminal block
Fuse holder


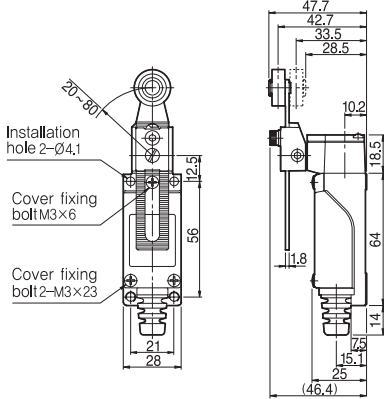
■ Top Plunger type

Appearance	Dimension	Operation characteristic
 <p>HY-L803</p>		<p>O.F max : 8.83 N (900 gf) R.F min : 1.47 N (150 gf) P.T max : 1.5 mm O.T min : 2.1 mm M.D max : 0.8 mm TTP : 3.0 mm</p>


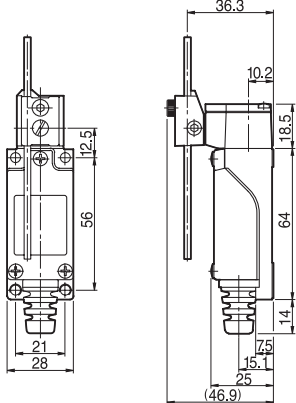
Control box
Cable connector

Discontinued Products


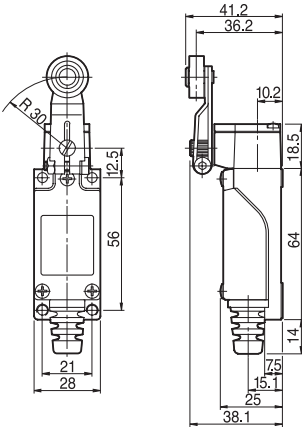
■ Roller Adjustable Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="258 705 345 730">HY-L804</p>		<p data-bbox="1005 440 1222 465">O,F max : 7,84 N (800 gf)</p> <p data-bbox="1005 479 1190 504">R,F min : 0,2 N (21 gf)</p> <p data-bbox="1005 517 1150 542">P,T max : 20 mm</p> <p data-bbox="1005 556 1129 581">O,T min : 70°</p> <p data-bbox="1005 595 1153 620">M,D max : 10 mm</p>

■ Adjustable Rod Lever


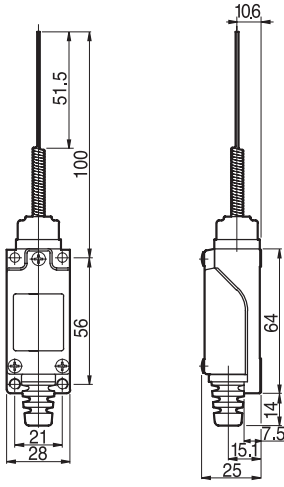
Appearance	Dimension	Operation characteristic
 <p data-bbox="258 1224 345 1250">HY-L807</p>		<p data-bbox="1005 958 1222 983">O,F max : 7,84 N (800 gf)</p> <p data-bbox="1005 996 1190 1022">R,F min : 0,1 N (21 gf)</p> <p data-bbox="1005 1035 1150 1060">P,T max : 20 mm</p> <p data-bbox="1005 1074 1129 1099">O,T min : 70°</p> <p data-bbox="1005 1112 1153 1137">M,D max : 10 mm</p>

■ Roller Lever

Appearance	Dimension	Operation characteristic
 <p data-bbox="258 1779 345 1804">HY-L808</p>		<p data-bbox="1005 1477 1222 1503">O,F max : 5,88 N (400 gf)</p> <p data-bbox="1005 1516 1190 1541">R,F min : 0,5 N (50 gf)</p> <p data-bbox="1005 1555 1129 1580">P,T max : 20°</p> <p data-bbox="1005 1593 1129 1619">O,T min : 70°</p> <p data-bbox="1005 1632 1129 1657">M,D max : 10°</p> <p data-bbox="1005 1671 1129 1696">T,T min : 90°</p>

HY-L800 series

■ Coil spring type


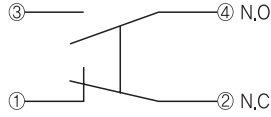
Appearance	Dimension	Operation characteristic
 <p data-bbox="292 830 392 850">HY-L809</p>		<p>O.F max : 0.88 N (90 gf) R.F min : - P.T max : 30 mm O.T min : 20 ° M.D max : - T.T min : 30 mm</p>

Control switch
Combination display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

●● Built in switch and connection diagram

Appearance (HY-800)	Connection diagram
	

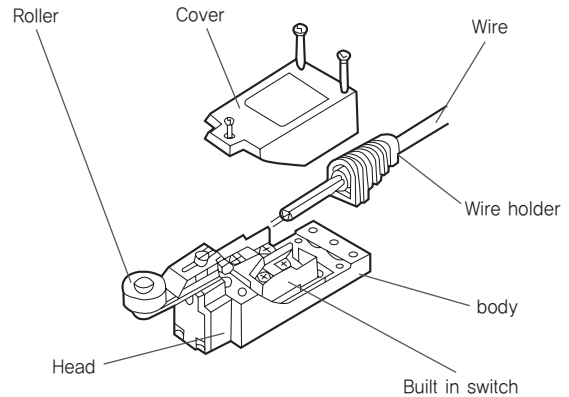
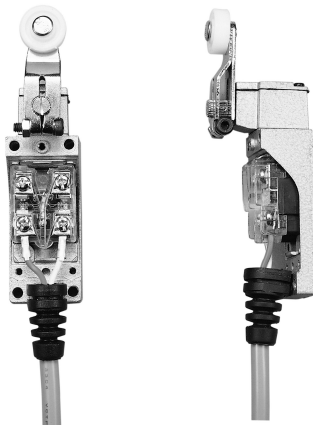
Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

●● Structure and name of each part

■ Image (After completed the connection)

■ Name of each part (structure)



Buzzer
Terminal block
Fuse holder

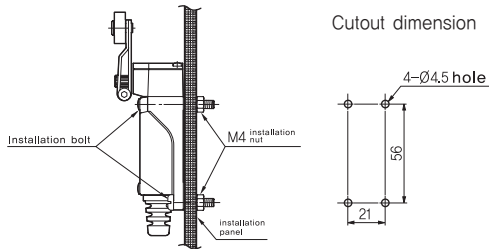
Control box
Cable connector

Discontinued Products

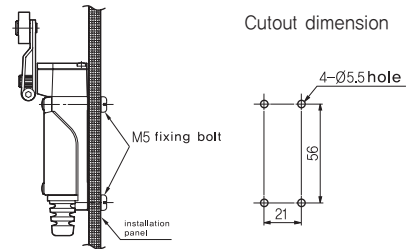
●● Installation method

※Front installation : Use M4 bolt, Back installation : Use M5 bolt.

■ Front installation

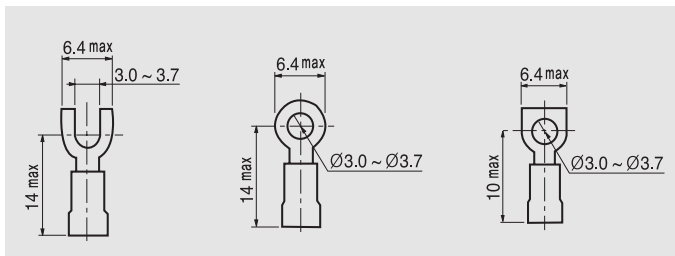


■ Back installation

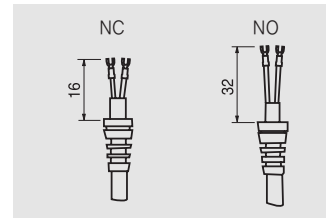


●● Applying pressure terminal

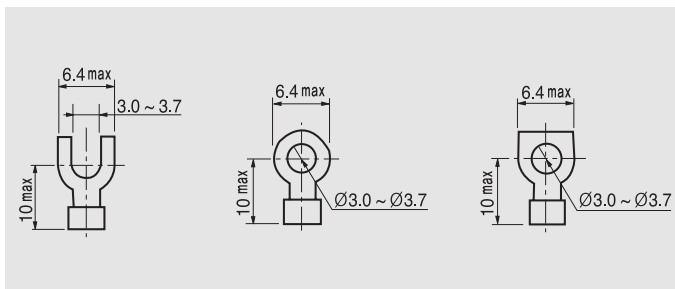
■ Insulation terminal



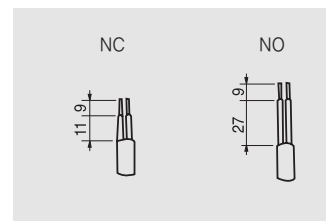
■ Wire handling when using the pressure terminal



■ Non-insulation terminal



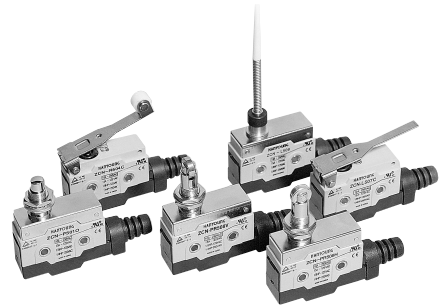
■ Wire handling when not using the pressure terminal



ZCN-500 series

Limit switch

- Gap of installation cutout dimension is same as micro switch (HY-P700)
- Certain operation and long life expectancy by applying Beryllium copper and running spring to the strong chemical resistance case.
- Compact size and light weight. (Strong mechanical durability)
- 9 types of actuators which provide wide usages
- Less force required to run the operation comparing to the normal limit switch.
- Excellent sealing



●● Specification

Contact structure	M4 screw tightening, 1c contact	
Contact material	AgCdO	
Protective structure	IP 54	
Rated current(Ie)	10 A 250 V a.c	
Dielectric strength	2,000 V a.c 50/60 Hz for 1 min (between the terminal and non-recharging metal part)	
Insulation resistance	Min 100 M Ω (500 V d.c insulated ohmmeter)	
Contact resistance	Max 50 M Ω (default value)	
Rated voltage(Ue)	250 V a.c	
Actuator intensity	5 times larger than O.F (force required to operate), operating direction 1 min	
Vibration	Double amplitude 1.5 mm, frequency 10 ~ 55 Hz, continuously 2 hour	
Shock	1,000 % \ddot{g} (durability), 300 % \ddot{g} (malfunction)	
Allowable operation speed	0.1 ~ 1 % (without damaging the actuator)	
Life expectancy	Mechanical	Min 1 million times (less than open/close frequency 120 times/min)
	Electrical	Min 300 thousand times (less than open/close frequency 20 times/min)
Ambient temperature	-10 ~ 80 °C	
Ambient humidity	25 ~ 95 % R.H.	
Weight	Approx 1010 g (10 ZCN-PR508H 1 box)	

●● Terminal arrangement

Appearance	Connection diagram
<p>↓ Actuator</p>	

Control switch
Combination
display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light


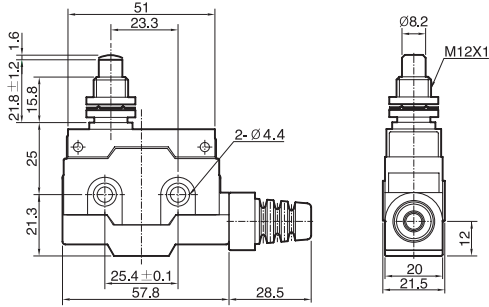
Buzzer
Terminal block
Fuse holder

Control box
Cable connector


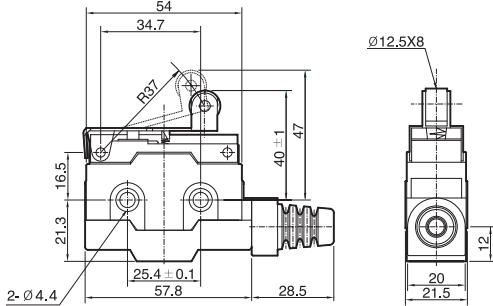
Discontinued
Products

Dimension (unit : mm)

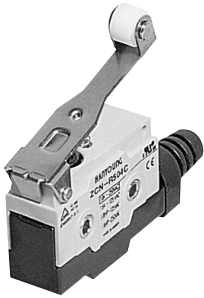
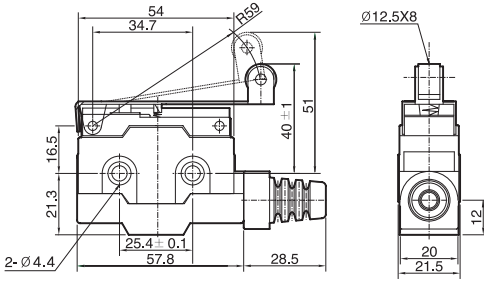
■ Plunger type

Appearance	Dimension	Operation characteristic
 <p>ZCN-P5010</p>		<p>O,F max : 5.88 N (600 gf) R,F min : 0.98 N (100 gf) P,T max : 1.6 mm O,T min : 5 mm M,D max : 0.2 mm O,P : 21.8 mm</p>

■ Hinge roller short lever type


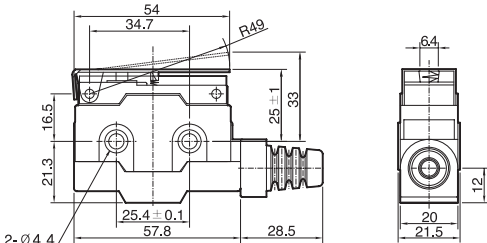
Appearance	Dimension	Operation characteristic
 <p>ZCN-R504A</p>		<p>O,F max : 5.88 N (600 gf) R,F min : 0.78 N (80 gf) O,T min : 2 mm M,D max : 1.5 mm F,P max : 47 mm O,P : 40 mm</p>

■ Hinge roller long lever type

Appearance	Dimension	Operation characteristic
 <p>ZCN-R504C</p>		<p>O,F max : 2.74 N (280 gf) R,F min : 0.95 N (60 gf) O,T min : 5 mm M,D max : 3 mm F,P max : 51 mm O,P : 40 mm</p>

ZCN-500 series

■ Hinge short lever type

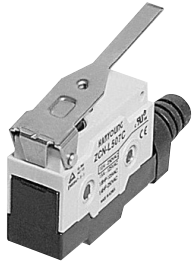
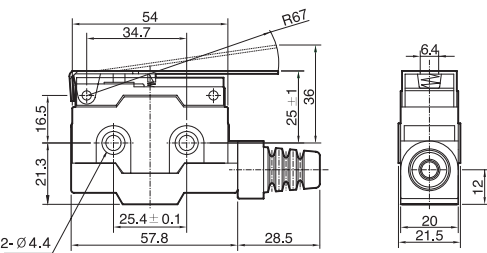
Appearance	Dimension	Operation characteristic
 <p>ZCN-L507A</p>		<p>O,F max : 3.92 N (400 gf) R,F min : 0.78 N (80 gf) O,T min : 2.5 mm M,D max : 1 mm F,P max : 33 mm O,P : 25 mm</p>

Control switch
Combination display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

■ Hinge long lever type


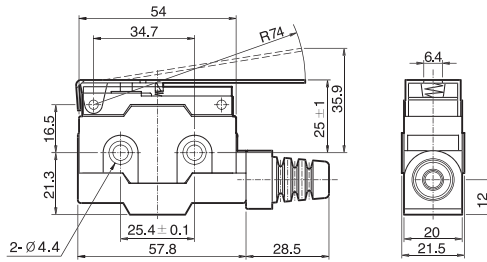
Appearance	Dimension	Operation characteristic
 <p>ZCN-L507C</p>		<p>O,F max : 2.74 N (280 gf) R,F min : 0.59 N (60 gf) O,T min : 4 mm M,D max : 1.4 mm F,P max : 36 mm O,P : 25 mm</p>

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

Buzzer
Terminal block
Fuse holder


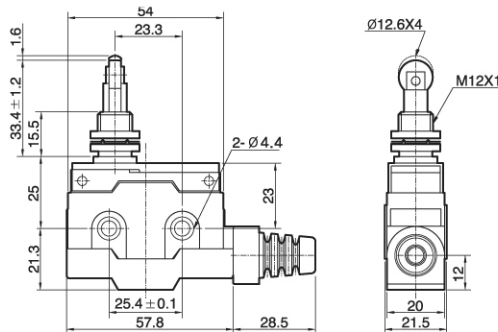
■ Hinge long lever type

Appearance	Dimension	Operation characteristic
 <p>ZCN-L507D</p>		<p>O,F max : 2.74 N (280 gf) R,F min : 0.59 N (60 gf) O,T min : 4 mm M,D max : 1.4 mm F,P max : 36 mm O,P : 25 mm</p>


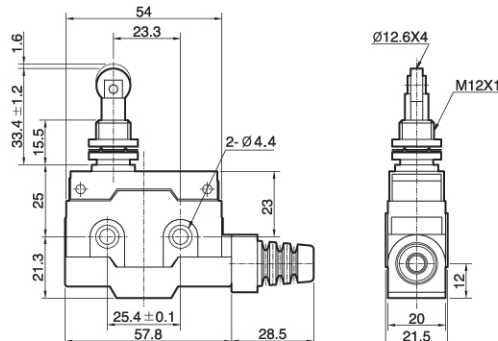
Control box
Cable connector

Discontinued Products


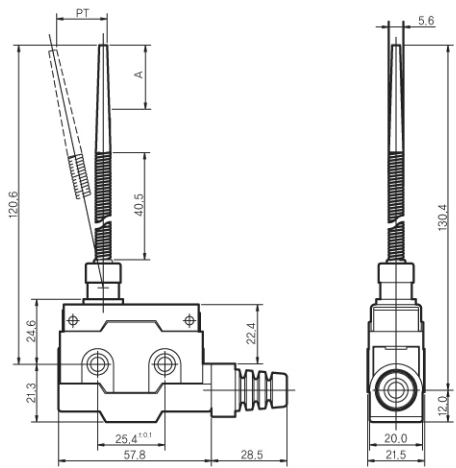
■ (Vertical) roller plunger type

Appearance	Dimension	Operation characteristic
 <p>ZCN-PR508V</p>		<p>O.F max : 5.88 N (600 gf) R.F min : 0.98 N (100 gf) P.T max : 1.6 mm O.T min : 5 mm M.D max : 0.2 mm O.P : 33.4 mm</p>

■ (Horizontal) roller plunger type

Appearance	Dimension	Operation characteristic
 <p>ZCN-PR508H</p>		<p>O.F max : 5.88 N (600 gf) R.F min : 0.98 N (100 gf) P.T max : 1.6 mm O.T min : 5 mm M.D max : 0.2 mm O.P : 33.4 mm</p>

■ Resin road coil spring type

Appearance	Dimension	Operation characteristic
 <p>ZCN-L509</p>		<p>O.F max : 5.88 N (600gf) P.T max : 19 mm T.T max : 40 mm</p>

A : Optimum operating range of the resin rod is within 1/3 of the entire length from the top end

HY-700 series

Micro switch

- Certain operation and long life expectancy due to the snap action tool and strong chemical resistance case (phenolic resin)
- Excellent repetitive accuracy and 10A opening / closing capacity
- Standard type, hole gap of installation cutout dimension : 25.4mm, fix with M4 bolt
- 9 types of actuators provide wide usages
- Terminal protective cover (optional)



Control switch
Combination display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

Buzzer
Terminal block
Fuse holder

Control box
Cable connector

Discontinued Products

●● Specification


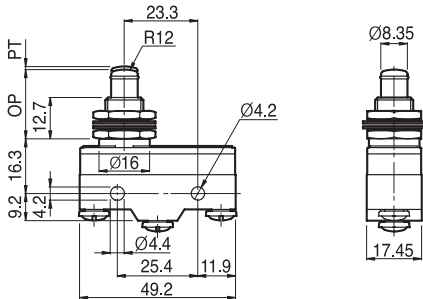
Contact structure	M4-5.5 screw tightening, 1c contact	
Contact material	AgCdO	
Protective structure	Standard type	
Rated current(Ie)	10 A 250 V a.c	
Dielectric strength	2,000 V a.c 50/60 Hz for 1min (between the terminal and non-recharging metal part)	
Insulation resistance	Min 100 M Ω (500 V d.c insulated ohmmeter)	
Contact resistance	Max 50 M Ω (default value)	
Rated voltage(Ue)	250 V a.c	
Vibration	Double amplitude 1.5mm, frequency 10 ~ 55 Hz, continuously 2 hour	
Shock	100 % (durability), 50 % (malfunction)	
Allowable operation speed	0.1 % ~ 1 %	
Life expectancy	Mechanical	Min 1 million times (less than open/close frequency 120 times/min)
	Electrical	Min 300 thousand times (less than open/close frequency 20 times/min)
Ambient temperature	-10 ~ 80 °C	
Ambient humidity	25 ~ 95 % R.H.	
Weight	Approx 800g (10 HY-R704B 1 box)	

●● Terminal arrangement


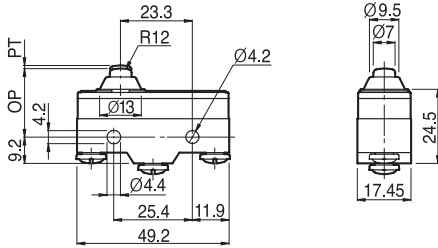
Appearance	Connection diagram
<p>↓ Actuator</p>	

Dimension (unit : mm)


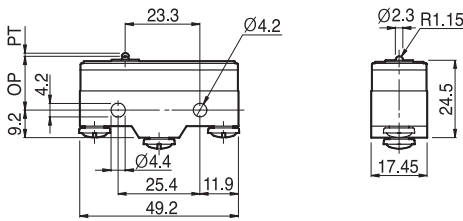
■ Panel mounting type

Appearance	Dimension	Operation characteristic
 <p>HY-P701A (Z4G1P05B)</p>		<p>O.F max : 3.73 N (380 gf) R.F min : 1.12 N (114 gf) P.T max : 1.0 mm O.T min : 5.2 mm M.D max : 0.13 mm O.P : 21.8 ±0.8 mm</p>

■ Spring single push button type


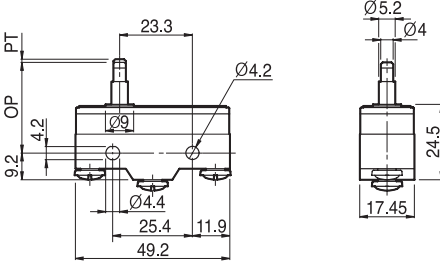
Appearance	Dimension	Operation characteristic
 <p>HY-P701B (Z4G1P09B)</p>		<p>O.F max : 3.73 N (380 gf) R.F min : 1.12 N (114 gf) P.T max : 1.0 mm O.T min : 1.3 mm M.D max : 0.13 mm O.P : 21.8 ±0.8 mm</p>

■ Pin push button type

Appearance	Dimension	Operation characteristic
 <p>HY-P701C (Z4G1P01B)</p>		<p>O.F max : 3.73 N (380 gf) R.F min : 1.12 N (114 gf) P.T max : 1.0 mm O.T min : 0.13 mm M.D max : 0.13 mm O.P : 16.0 ±0.5 mm</p>

HY-700 series


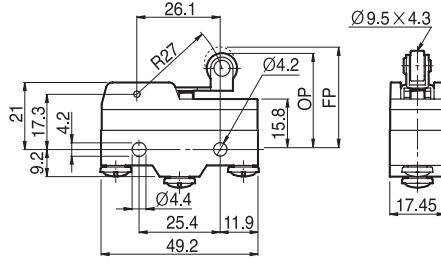
■ Spring stander push button type

Appearance	Dimension	Operation characteristic
 <p>HY-P701D (Z4G1P03B)</p>		<p>O,F max : 3.73 N (380 gf) R,F min : 1.12 N (114 gf) P.T max : 1.0 mm O.T min : 1.3 mm M,D max : 0.13 mm O,P : 28.2 ±0.6 mm</p>

Control switch
Combination display light

Power switch
Main switch
Cam switch

■ Hinge roller single lever type

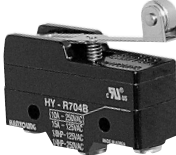
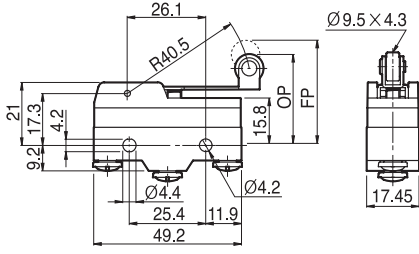
Appearance	Dimension	Operation characteristic
 <p>HY-R704A (Z4G1L07B)</p>		<p>O,F max : 1.57 N (160 gf) R,F min : 0.27 N (28 gf) P.T max : 5.0 mm O.T min : 2.0 mm M,D max : 1.2 mm O,P : 30.2 ±1.0 mm</p>

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

■ Hinge roller middle lever type

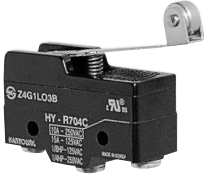
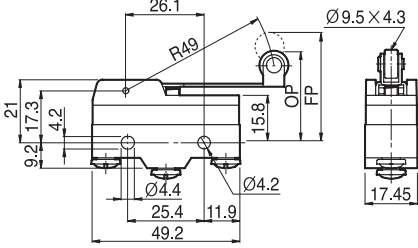
Appearance	Dimension	Operation characteristic
 <p>HY-R704B</p>		<p>O,F max : 1.18 N (120 gf) R,F min : 0.2 N (28 gf) P.T max : 5.0 mm O.T min : 2.0 mm M,D max : 1.2 mm O,P : 30.2 ±1.0 mm</p>

Buzzer
Terminal block
Fuse holder


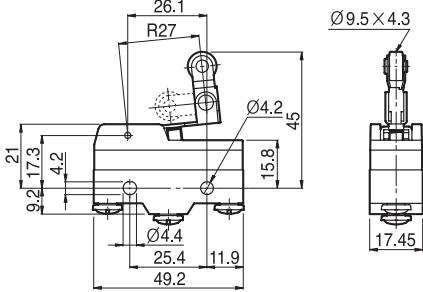
Control box
Cable connector

Discontinued Products


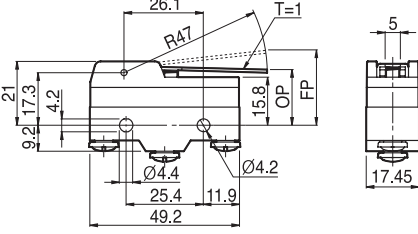
■ Hinge roller lever type

Appearance	Dimension	Operation characteristic
 <p data-bbox="248 606 358 658">HY-R704C (Z4G1L03B)</p>		<p data-bbox="1005 394 1225 606">O,F max : 0.98 N (100 gf) R,F min : 0.14 N (14 gf) P.T max : 8.0 mm O.T min : 3.6 mm M,D max : 2.4 mm O.P : 30.2 ±1.0 mm</p>

■ 2 positions roller lever type


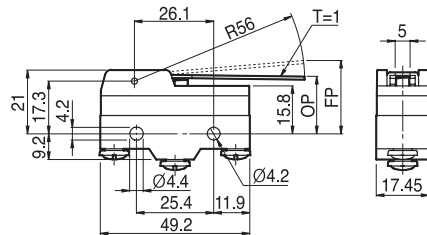
Appearance	Dimension	Operation characteristic
 <p data-bbox="239 1079 361 1107">HY-R704-2W</p>		<p data-bbox="1005 867 1225 1079">O,F max : 0.98 N (100 gf) R,F min : 0.14 N (14 gf) P.T max : 8.0 mm O.T min : 3.6 mm M,D max : 0.5 mm O,P : 43.2 ±1.4 mm</p>

■ Single position lever type

Appearance	Dimension	Operation characteristic
 <p data-bbox="254 1566 347 1593">HY-L707A</p>		<p data-bbox="1005 1354 1225 1566">O,F max : 1.57 N (160 gf) R,F min : 0.27 N (28 gf) P.T max : 5.0 mm O.T min : 2.0 mm M,D max : 1.2 mm O,P : 19.1 ±1.0 mm</p>

HY-700 series

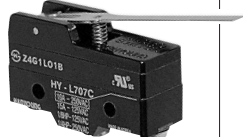
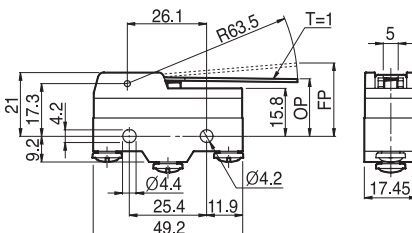
■ Middle lever type

Appearance	Dimension	Operation characteristic
 <p>HY-L707B</p>		<p>O.F max : 1,18 N (120 gf) R.F min : 0,20 N (20 gf) P.T max : 6,5 mm O.T min : 2,8 mm M,D max : 1,8 mm O.P : 19,1 ±1,0 mm</p>

Control switch
Combination display light

Power switch
Main switch
Cam switch

■ Hinge lever type

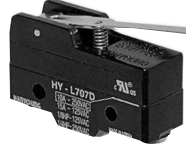
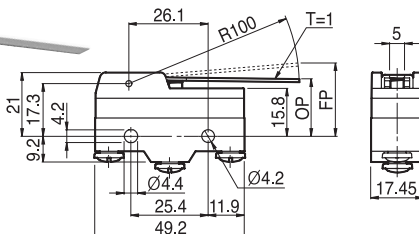
Appearance	Dimension	Operation characteristic
 <p>HY-L707C (Z4G1L01B)</p>		<p>O.F max : 0,98 N (100 gf) R.F min : 0,14 N (14 gf) P.T max : 1,0 mm O.T min : 4,0 mm M,D max : 2,4 mm O.P : 19,1 ±1,0 mm</p>

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

■ Special lever type


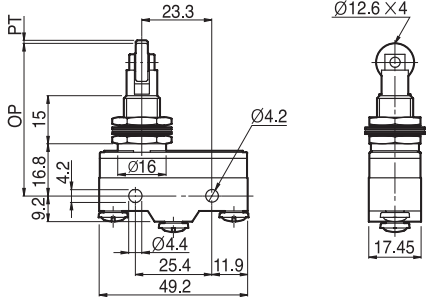
Appearance	Dimension	Operation characteristic
 <p>HY-L707D</p>		<p>O.F max : 0,78 N (80 gf) R.F min : 0,1 N (10 gf) P.T max : 1,4 mm O.T min : 5,6 mm M,D max : 3,5 mm O.P : 19,1 ±1,0 mm</p>

Buzzer
Terminal block
Fuse holder


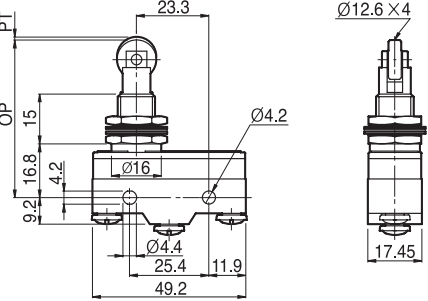
Control box
Cable connector

Discontinued Products

■ Roller panel mounting type (Vertical)

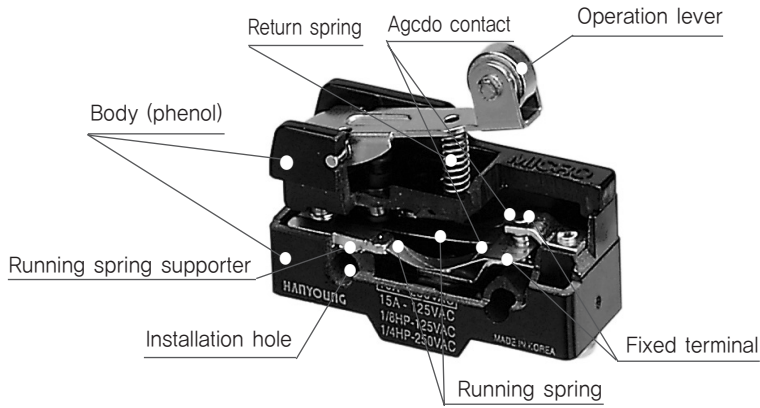
Appearance	Dimension	Operation characteristic
 <p data-bbox="244 606 358 633">HY-PR708A</p>		<p data-bbox="1005 394 1225 421">O,F max : 3.73 N (380 gf)</p> <p data-bbox="1005 432 1210 459">R,F min : 1.12 N (114 gf)</p> <p data-bbox="1005 471 1153 498">P,T max : 1.0 mm</p> <p data-bbox="1005 510 1159 537">O,T min : 3.2 mm</p> <p data-bbox="1005 548 1173 575">M,D max : 0.13 mm</p> <p data-bbox="1005 587 1182 614">O,P : 33.3 ±1.4 mm</p>

■ Roller panel mounting type

Appearance	Dimension	Operation characteristic
 <p data-bbox="244 1083 358 1132">HY-PR708B (Z4G1P07B)</p>		<p data-bbox="1005 867 1225 894">O,F max : 3.73 N (380 gf)</p> <p data-bbox="1005 906 1210 933">R,F min : 1.12 N (114 gf)</p> <p data-bbox="1005 944 1153 971">P,T max : 1.0 mm</p> <p data-bbox="1005 983 1159 1010">O,T min : 3.2 mm</p> <p data-bbox="1005 1022 1173 1049">M,D max : 0.13 mm</p> <p data-bbox="1005 1060 1182 1087">O,P : 33.3 ±1.4 mm</p>

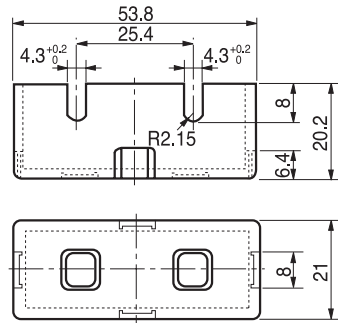
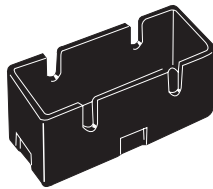
Structure

Internal structure

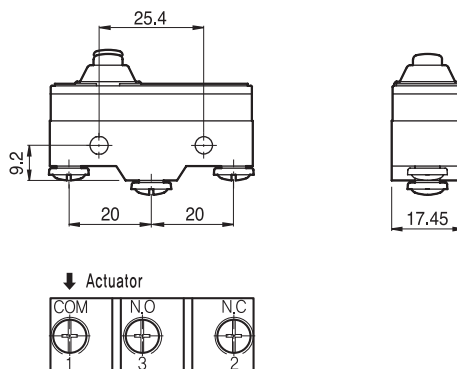


Terminal protective cover

MS-10



Dimension and terminal arrangement



Control switch
Combination display light

Power switch
Main switch
Cam switch

Limit switch
Micro switch

Hoist switch
Foot switch
Mono lever switch

Sign tower
Signal light

Buzzer
Terminal block
Fuse holder

Control box
Cable connector

Discontinued Products

