

Micro Switch

Z15 Series



Part Number Description

Z15 - ① ② B

| | | | | |
|---------------|-----------------------------------|---|-------------------------------|------------------------|
| ① Description | G : Standard | H : High Sensitive (Only 060, 08) | | |
| ② Head Type | 01 : Push Plunger | 010 : Pin Push Plunger | 10 : Short Push Plunger | 03 : Long Push Plunger |
| | 030 : Roller Plunger | 031 : Cross Roller Plunger | 05 : Lever | 052 : Roller Lever |
| | 063 : Hinge Short Lever | 062 : Hinge Short Lever | 061 : Hinge Long Lever | 06 : Hinge Long Lever |
| | 060 : Hinge Long Lever (Only H) | 08 : Hinge Long Lever (Only H) | 09 : Hinge Roller Short Lever | |
| | 07 : Hinge Roller Long Lever | 73 : Hinge Roller Long Lever (Plastic Roller) | | |

General Specification

| | | | |
|----------------------------|-----------------------|------------------------|--|
| Contact Form | 1C | | |
| Contact Material | Ag alloy | | |
| Contact & Contact Distance | Z15G : 0.5mm | Z15H : 0.25mm | |
| Insulation Resistance | 100MΩ min.(at 500VDC) | | |
| Contact Resistance | Max. 50mΩ | | |
| Maximum Inrush Current | Normal Open (N/O) 15A | Normal Close (N/C) 30A | |

| Contact Ratings | Voltage | Non-Inductive | | | Inductive | | |
|-----------------|---------|-----------------|-------------------|--------------------|----------------|-------------------|--------------------|
| | | Resistance Load | Lamp Load | | Inductive Load | Motor Load | |
| | | | Normal Open (N/O) | Normal Close (N/C) | | Normal Open (N/O) | Normal Close (N/C) |
| | 125VAC | 15A | 1.5A | 3A | 15A | 2.5A | 5A |
| | 250VAC | 15A | 1.25A | 2.5A | 15A | 1.5A | 3A |
| | 500VAC | 10A | 0.75A | 1.5A | 6A | 0.75A | 1.5A |
| | 8VDC | 15A | 1.5A | 3A | 15A | 2.5A | 5A |
| | 14VDC | 15A | 1.5A | 3A | 10A | 2.5A | 5A |
| | 30VDC | 6(2)A | 1.5A | 3A | 5(1)A | 2.5(1)A | 5(1)A |
| | 125VDC | 0.5A | 0.5A | 0.5A | 0.05A | 0.05A | 0.05A |
| | 250VDC | 0.25A | 0.25A | 0.25A | 0.03A | 0.03A | 0.03A |

The values in the blanks are ratings of Z15H type switch. The Z15H type switch has AC ratings of 125 V and 250 V. The aforementioned values are steady-state current values.

The inductive load has a power factor of 0.4 or more (AC), and a time constant of 7m/s or less (DC).

The inrush current is ten times larger than steady-state current in the lamp load, and six times, in the motor load.

| | | |
|----------------------|-------------------------------------|-----------------|
| Operating Speed | 0.01mm/sec ~ 0.5m/sec | |
| Dielectric Strength | 2000VAC 1 Minute | |
| Life Cycle | Electrical | Min. 500,000 |
| | Mechanical | Min. 20,000,000 |
| Vibration Resistance | 10Hz ~ 55Hz Durable amplitude 1.5mm | |
| Shock Resistance | Malfunctional | Max. 30G |
| | Destruction | Max. 100G |
| Ambient Temperature | -25 °C ~ +80 °C(with no icing) | |
| Ambient Humidity | 35% ~ 85% RH | |
| Tightening Torque | 1.2N·m (12.24kgf·cm) | |

☞ This is the case for the push-button type (The values are for the actuator for the lever type).

In the types other than the push-button type, the mechanical life is 10 million times, and the operating error is 1 ms or less.

Product Selection

| | Part Number | Head Type | OF | RF | PT | OT | ME | MD | FD | OP | KS |
|---|-------------|----------------------|-------------------------------|------------------|--------|---------|----|---------|----|------------------|----------|
|  | Z15G - 01B | Push Plunger | 250 ~ 350gf (2.45 ~ 3.43N) | 114gf (1.12N) | 0.4 mm | 0.13 mm | | 0.05 mm | | 15.9 ± 0.4 mm | Z4G1P01B |
|  | Z15G - 010B | Pin Push Plunger | 250 ~ 350gf (2.45 ~ 3.43N) | 114gf (1.12N) | 0.4 mm | 0.16 mm | | 0.05 mm | | 28.2 ± 0.5 mm | Z4G1P03B |
|  | Z15G - 10B | Short Push Plunger | 250 ~ 350gf (2.45 ~ 3.43N) | 114gf (1.12N) | 0.4 mm | 0.16 mm | | 0.05 mm | | 21.5 ± 0.5 mm | Z4G1P09B |
|  | Z15G - 03B | Long Push Plunger | 250 ~ 350gf (2.45 ~ 3.43N) | 114gf (1.12N) | 0.4 mm | 5.5 mm | | 0.05 mm | | 21.8 ± 0.8 mm | Z4G1P05B |
|  | Z15G - 030B | Roller Plunger | 250 ~ 350gf (2.45 ~ 3.43N) | 114gf (1.12N) | 0.4 mm | 3.58 mm | | 0.05 mm | | 33.4 ± 1.2 mm | Z4G1P07B |
|  | Z15G - 031B | Cross Roller Plunger | 250 ~ 350gf (2.45 ~ 3.43N) | 114gf (1.12N) | 0.4 mm | 3.58 mm | | 0.05 mm | | 33.4 ± 1.2 mm | |






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Product Selection

| | Part Number | Head Type | OF | RF | PT | OT | ME | MD | FD | OP | KS |
|---|-------------|-------------------|-------------------|-------------------|----|--------|----|---------|---------|------------------|----------|
|  | Z15G - 05B | Lever | 141 gf (1.38N) | 14gf (0.14N) | | 1.6 mm | | 1.3 mm | 20.6 mm | 17.4 ± 0.8 mm | Z4G1R01B |
|  | Z15G - 052B | Roller Lever | 141 gf (1.38N) | 14gf (0.14N) | | 1.6 mm | | 1.3 mm | 31.8 mm | 28.6 ± 0.8 mm | Z4G1R03B |
|  | Z15G - 063B | Hinge Short Lever | 160 gf (1.57N) | 28gf (0.27N) | | 2.0 mm | | 1.0 mm | 24.8 mm | 19.0 ± 0.8 mm | Z4G1R05B |
|  | Z15G - 062B | Hinge Short Lever | 95 gf (0.95N) | 18gf (0.18N) | | 4.2 mm | | 0.95 mm | 26.2 mm | 19.0 ± 0.8 mm | |
|  | Z15G - 061B | Hinge Long Lever | 80gf (0.78N) | 15.5gf (0.15N) | | 4.8 mm | | 1.12 mm | 27.2 mm | 19.0 ± 0.8 mm | |
|  | Z15G - 06B | Hinge Long Lever | 70gf (0.69N) | 14gf (0.14N) | | 5.6 mm | | 1.27 mm | 28.2 mm | 19.0 ± 0.8 mm | Z4G1L01B |

Product Selection

| | Part Number | Head Type | OF | RF | PT | OT | ME | MD | FD | OP | KS |
|---|-------------|---|---------------------|------------------|---------|---------|----|--------|---------|------------------|----------|
|  | Z15H - 060B | Hinge Long Lever | 6gf (58.8 mN) | 0.5gf (4.90N) | 19.8 mm | 10.0 mm | | 2.0 mm | | 19.8 ± 1.6 mm | |
|  | Z15H - 08B | Hinge Long Lever | 4gf (39.2N) | 0.3gf (2.94N) | 10.0 mm | 6.0 mm | | 3.0 mm | | 20.0 ± 1.0 mm | Z4G1P05B |
|  | Z15G - 09B | Hinge Roller Short Lever | 160gf (1.57N) | 42g (0.41N) | | 2.4 mm | | 0.5 mm | 32.5 mm | 30.2 ± 0.4 mm | Z4G1L07B |
|  | Z15G - 07B | Hinge Roller Long Lever | 100 gf (0.98N) | 22gf (0.22N) | 4.0 mm | 1.02 mm | | | 36.5 mm | 30.2 ± 0.8 mm | Z4G1L03B |
|  | Z15G - 073B | Hinge Roller Long Lever (Plastic Roller) | 100 gf (0.98N) | 21gf (0.21N) | 4.0 mm | 1.6 mm | | | 47.5 mm | 41.2 ± 0.8 mm | |

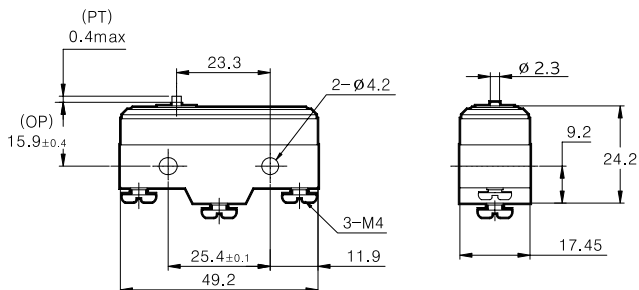
Micro Switch

Z15 Series

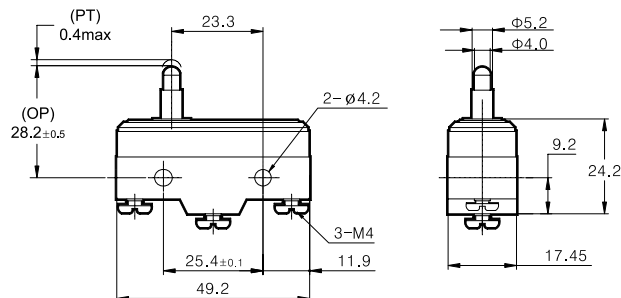
Dimension

unit : mm

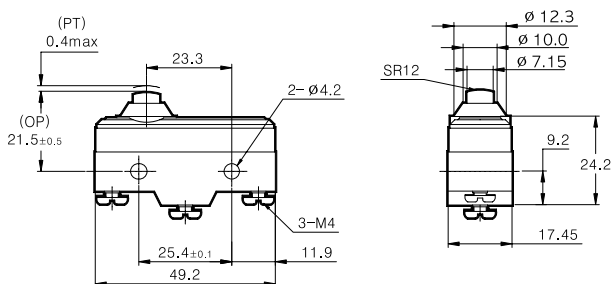
Z15G - 01B



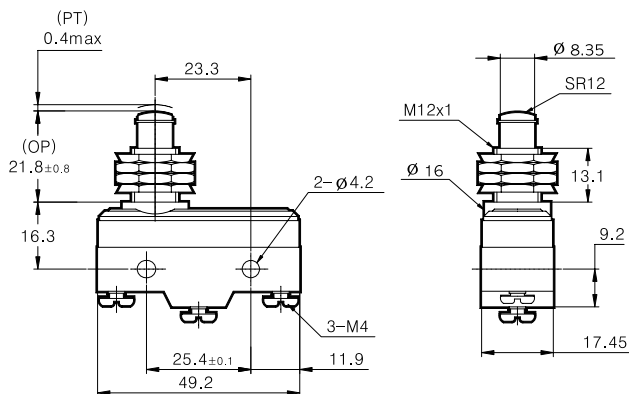
Z15G - 010B



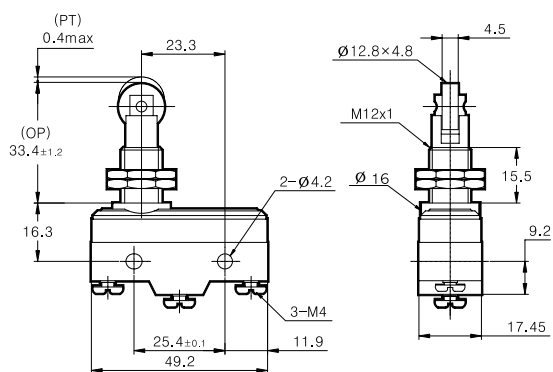
Z15G - 10B



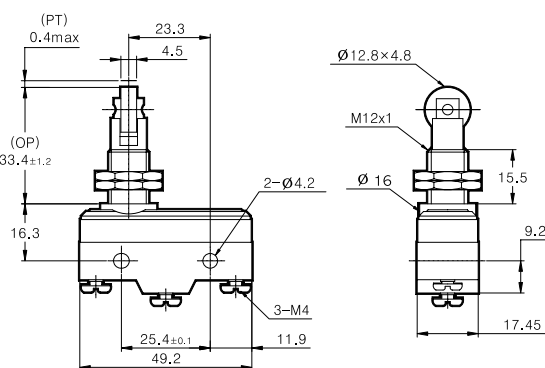
Z15G - 03B



Z15G - 030B



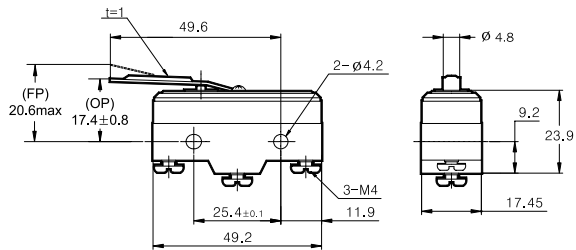
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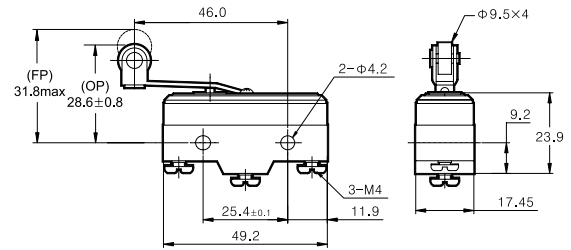
Dimension

unit : mm

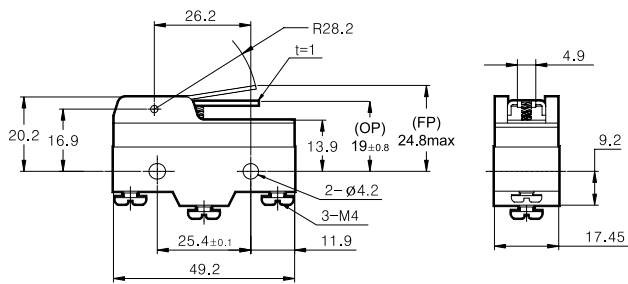
Z15G - 05B



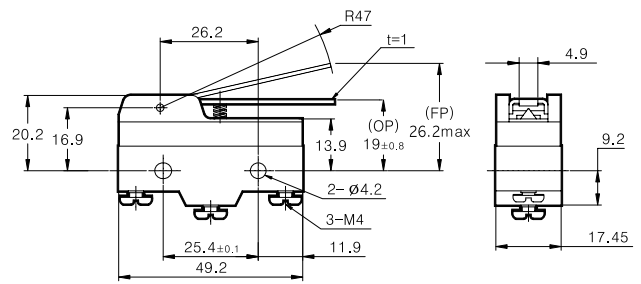
Z15G - 052B



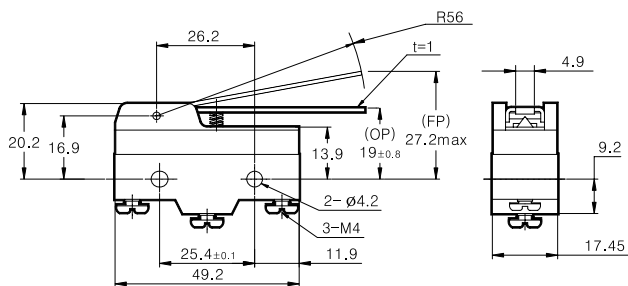
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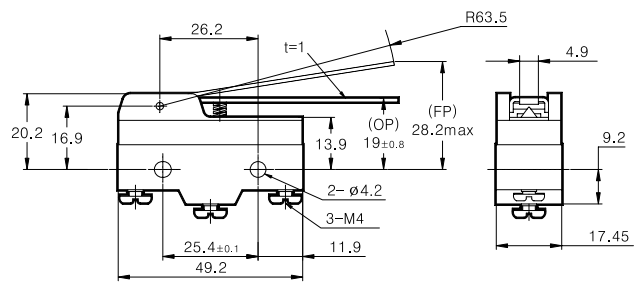
Z15G - 062B



Z15G - 061B



Z15G - 06B



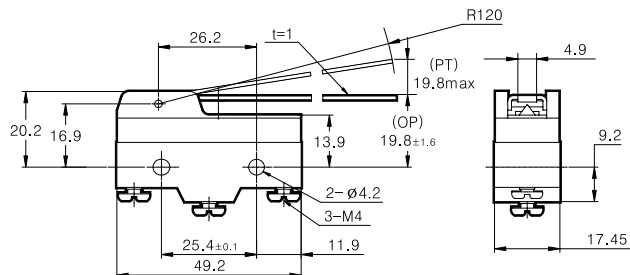
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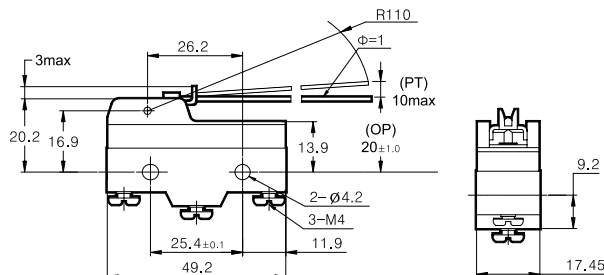
Dimension

unit : mm

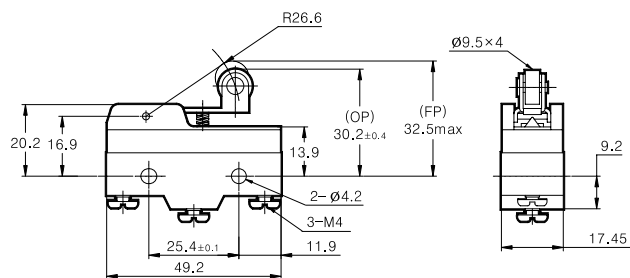
Z15H - 060B



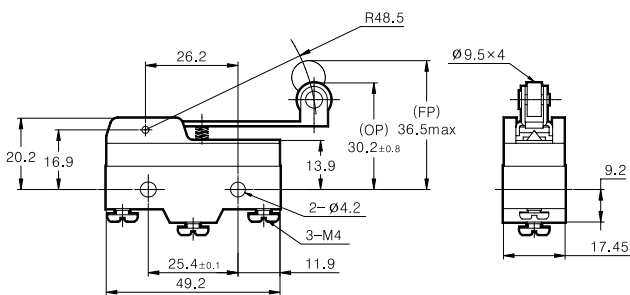
Z15H - 08B



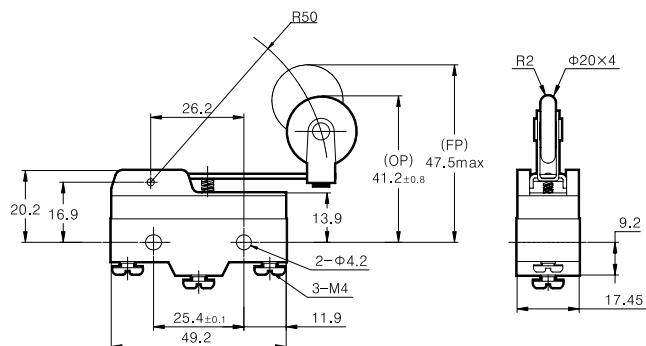
Z15G - 09B



Z15G - 07B



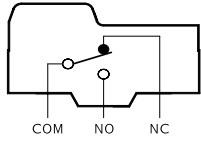
Z15G-073B



Dimension

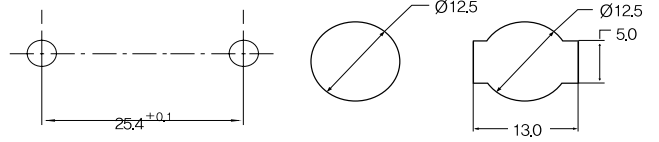
unit : mm

Diagram



COM : Common Terminal
NO : Normal Open Terminal
NC : Normal Close Terminal

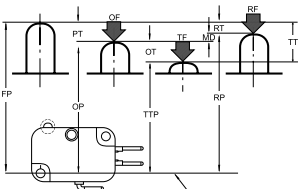
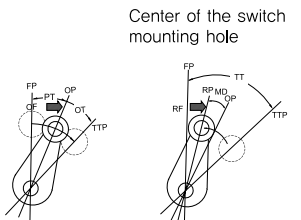
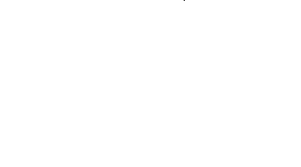
Panel Cut Out



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Glossary

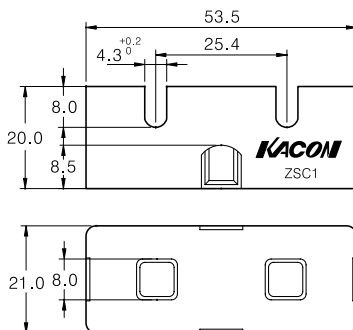
| Operating characteristics | Category | Abbr. | Term | Unit | Definition |
|---|----------|----------------------------------|------|------------|--|
|  | Force | Force required for operation | OF | g, kg g-mm | Force on the actuator required for the motion from the free position to the operating position |
| | | Restoring force | RF | g, kg g-mm | Force on the actuator required for the motion from the operating limit position to the restoring position |
| | | Force required for entire motion | TF | g, kg g-mm | Force on the actuator required for the motion from the operating position to the operating limit position |
|  <p>Center of the switch mounting hole</p> | Motion | Motion to the operating position | PT | mm, deg | Distance or angle from the free position of the actuator to the operating position |
| | | Motion after operation | OT | mm, deg | Distance or angle from the operating position of the actuator to the operating limit position |
| | | Hysteresis distance | MD | mm, deg | Distance or angle from the operating position of the actuator to the restoring position |
| | | Total motion | TT | mm, deg | Distance or angle from the free position of the actuator to the operating limit position |
|  | Position | Free position | FP | mm, deg | The position of the operating part when no force is applied from outside |
| | | Operating position | OP | mm, deg | The position of the actuator when the external force is applied to the actuator and the moving contact reverses from the free position |
| | | Restoring position | RP | mm, deg | The position of the actuator when the external force to the actuator is reduced and the moving contact reverses from the operating position to the free position |
| | | Operating limit position | TTP | mm, deg | The position of the actuator when the actuator reaches the actuator stop position |

Option

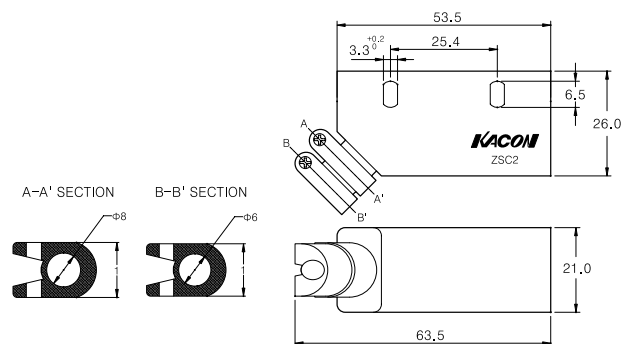
(mm)

SAFETY COVER

ZSC1



ZSC2



Electrical Caution

● Electrical conditions

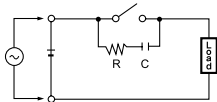
Check the rating because the contact has different breaking capacities for AC and DC.
 For microvoltage and microcurrent, use the contact for microload.
 Check the inrush current, steady-state current and inrush time.
 Measure the contact resistance at DC 6 V ~ DC 8 V and 1 A
 (Comply with the voltage drop method for the microcurrent).
 The difference between the steady-state current and inrush current may vary according to the load type. Check the inrush current value.

● The ratings are based on the following conditions.

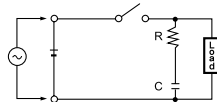
Inductive load: power factor 0.4 or more (AC), time constant 7 ms or less (DC)
 Lamp load: Inrush current $\geq 10 \times$ Steady-state current
 Motor load: Inrush current $\geq 6 \times$ Steady-state current

● Notes for the circuit

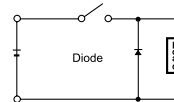
In the inductive load breaking circuit, the surge and inrush current at the opening/closing of the circuit may cause contact problems.
 Therefore, it is desirable to insert a protection circuit as follows.



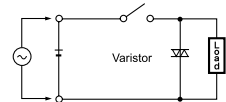
Normally used for DC circuits.
 A resistor of several ohms is required.
 When used for AC circuit, the load must be small.
 R: $10 \Omega \sim 100 \Omega$
 C: $0.05 \sim 0.1 \mu\text{F}$



Used both for AC and DC circuits.
 R: 10Ω
 C: $0.1 \sim 0.2 \mu\text{F}$

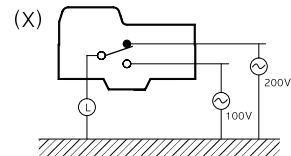


Used only for DC circuits.
 Select a diode with sufficient margin to the inverse withstand voltage.



Used both for AC and DC circuits.
 Select a varistor that is 1.5 times higher than the power supply voltage.

Do not connect different polarities and types of power to one switch contact.
 Do not apply the voltage between contacts (This causes the mixed contact and contact weld)



● Application to the electronic circuits (low voltage and current)

1. The micro switch generates bouncing and chattering between contacts when it is switched on/off.
 This causes troubles, including noises and wrong pulses, to the electronic circuits or acoustic devices.
2. When bouncing and chattering cause problems, studies are required to provide an absorption circuit in addition to the CR circuit.
3. In the areas that require high contact reliability, the Ag contacts, which have been widely used, are hardly used.
 Au contacts have high performances for microvoltage and microcurrent.

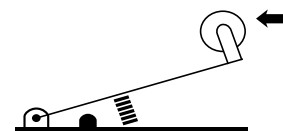
Mechanical Caution

● Mechanical conditions

Select the actuator according to the operating method.
 Do not apply excessive force to the actuator.
 Check the switching speed and frequency.
 1) If the switching speed is too slow and unstable, poor contact or contact weld may occur.
 2) If the switching speed is too high, switching may not be completed.

● Precautions

The operating method, cam or dog type, frequency, motion after switching significantly influence the product life and accuracy. Use the cams or dogs that have general shapes.
 Do not allow the load to one side of the switch actuator, and prevent the partial wear.
 Adjust the actuator so that it does not pass beyond OT.
 The proper operating stroke is 70% ~ 100 % of the standard OT.
 If OT passes beyond the limit, it may cause failure.
 Use the switch considering the characteristics of the actuator.
 In the case of the roller arm lever, do not apply force in the arrowed direction in the figure.
 Avoid the modification of the operating position by processing the actuator.



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Mounting Caution

● Environment

If the switch is not waterproof and sealed, do not use the product in the environment where oil or water scatters or bursts.

Use the protective cover to avoid direct exposure to the liquid. A limit switch is more proper for this case than the standard switch.

Contact us when using the limit switch outside or with special cutting oil so that the deterioration of the switch material is expected.

Place the switch on the place where it is not directly exposed to the processing waste or dusts.

Protect the actuator and switch body from the cutting waste or foreign matters.

Do not use the switch in the temperature and air conditions other than specified.

The allowable ambient temperature varies according to the product type (Check the product specifications).

In the case of abrupt thermal change, the heat impact deforms the switch and causes failure.

When mounting the switch in the place where operating errors or accidents may happen in the normal operator or equipment conditions, additional measures are required.

● The panel mounting type

Use M4 screws for fixing. Mount the product firmly using flat or spring washers.

The proper tightening torque is 12 ~ 15 kgf·cm (1.18 ~ 1.47 N·m).

The proper tightening torque for the hexagonal nut of the actuator is 50 kgf·cm (4.9 N·m).

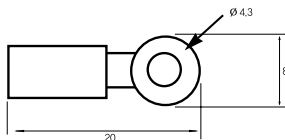
When mounting the panel mounting pushbutton type on the side using screws, remove the hexagonal nuts from the actuator part.

For the connection with lead terminals, use crimp terminals at a tightening torque of 8 ~ 12 kgf·cm (0.78 ~ 1.18 N·m). (Recommended wire spec.: VCT 1.25 mm² twowire, three-wire)

● The drip-proof type

Do not soak the product in oil because this product is not completely oil-tight.

Avoid using this product in the condition where temperature abruptly changes.



☞ Specifications and materials can change without prior notice.