

## Stable Operation at an Ambient Temperature of 400°C

- Incorporates a ceramic insulator, cobalt-alloy spring, and special-alloy contact, thus ensuring high contact reliability at high ambient temperature.
- Smoothly operates at an ambient temperature of 400°C.



Be sure to read *Safety Precautions* on page 3 and *Safety Precautions for All Basic Switches*.

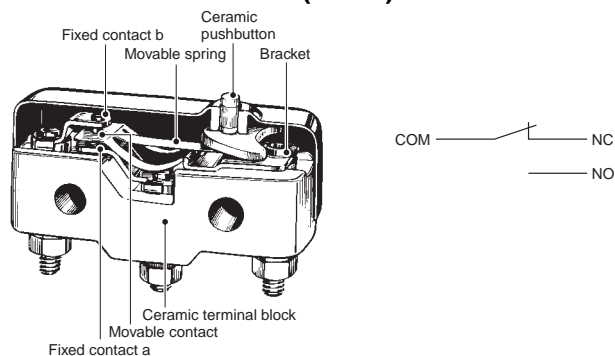
## Ordering Information

Actuator		Model
Pin plunger		TZ-1G
Hinge lever		TZ-1GV
Short hinge roller lever		TZ-1GV22
Hinge roller lever		TZ-1GV2

Note: The levers and rollers are made of stainless steel.

## Structure

### Structure/Contact Form (SPDT)



## Specifications

### Ratings

Rated voltage (V)	Non-inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	1		0.9	0.45	1		1.5	0.75
250 VAC	1		0.45	0.3	1		0.45	0.3
8 VDC	1		0.9	0.45	1		1.5	1.5
14 VDC	1		0.9	0.45	1		1.5	1.5
30 VDC	1		0.9	0.45	1		1.5	1.5
125 VDC	0.4		0.05	0.05	0.4		0.05	0.05

Note: 1. The above current ratings are the values of the steady-state current.  
 2. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).  
 3. Lamp load has an inrush current of 10 times the steady-state current.  
 4. Motor load has an inrush current of 6 times the steady-state current.  
 5. The above ratings are tested under the following conditions.  
 Ambient temperature: 20±2°C  
 Ambient humidity: 65±5%RH  
 Switching frequency: 20 times/min

### Characteristics

Operating speed		0.05 mm to 1 m/s *1
Operating frequency	Mechanical	60 operations/min
	Electrical	20 operations/min
Insulation resistance		100 MΩ min. (at 500 VDC)
Contact resistance		100 mΩ max. (initial value)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground and between each terminal and non-current-carrying metal parts
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude *2
Shock resistance	Destruction	500 m/s <sup>2</sup> max.
	Malfunction	300 m/s <sup>2</sup> max. *1 *2
Durability	Mechanical	100,000 operations min.
	Electrical	50,000 operations min.
Degree of protection		IP00
Electric shock protection		Class I
Ambient operating temperature		-65°C to 400°C (with no icing)
Ambient operating humidity		35% to 85%RH
Weight		Approx. 45 to 54 g

\*1. This operating speed applies to switches with pin-type pushbuttons.

\*2. This refers to a malfunction period of 1 ms max.

### Contact Specifications

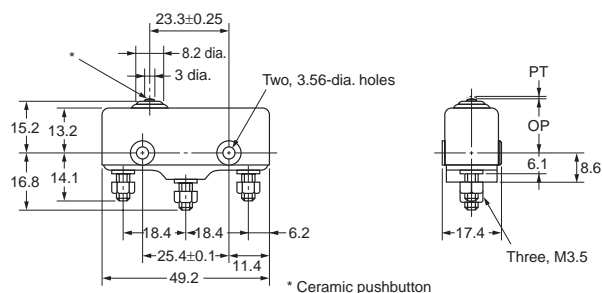
Contact	Specification	Rivet
	Material	Platinum alloy
	Gap (standard value)	0.5 mm
Inrush current	NC	9 A max.
	NO	4.5 A max.

# Dimensions and Operating Characteristics

(Unit: mm)

## Pin Plunger

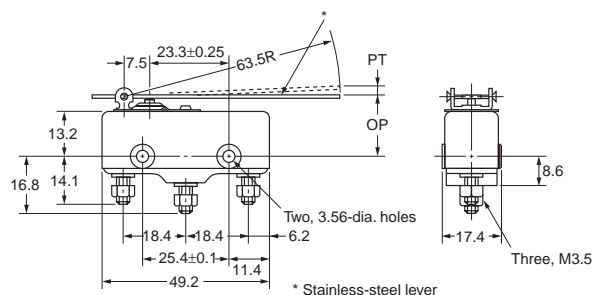
### TZ-1G



Operating force	OF max.	4.9 N
Release force	RF min.	1.12 N
Pretravel	PT max.	0.4 mm
Over travel	OT min.	0.13 mm
Movement Differential	MD max.	0.15 mm
Operating Position	OP	15.9±0.6 mm

## Hinge Lever

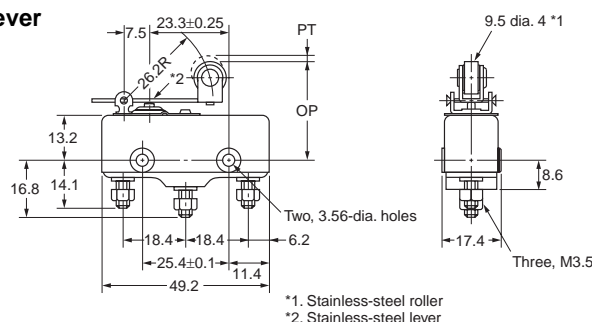
### TZ-1GV



OF max.	0.98 N
RF min.	0.14 N
PT max.	3.5 mm
OT min.	4.6 mm
MD max.	1.3 mm
OP	18±1.2 mm

## Short Hinge Roller Lever

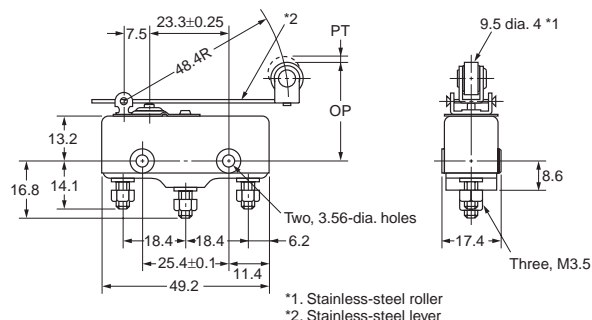
### TZ-1GV22



OF max.	2.35 N
RF min.	0.34 N
PT max.	1.5 mm
OT min.	1.9 mm
MD max.	0.6 mm
OP	28.6±1.2 mm

## Hinge Roller Lever

### TZ-1GV2



OF max.	1.27 N
RF min.	0.2 N
PT max.	2.6 mm
OT min.	3.5 mm
MD max.	1 mm
OP	28.6±1.2 mm

Note: Each dimension has a tolerance of  $\pm 0.4$  mm unless otherwise specified.

## Safety Precautions

Refer to *Safety Precautions for All Basic Switches*.

### Precautions for Safe Use

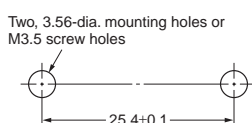
#### Handling

The Switch has a ceramic casing. Do not drop the Switch from a height of 30 cm or more. Doing so will break the casing.

#### Mounting

- Be sure to turn OFF the power supply to the Switch before mounting, dismounting, wiring, or working on the Switch for maintenance.
- Mount the switch with M3.5 stainless-steel screws with plane washer and spring washers securely.  
Use M3.5 stainless-steel mounting screws with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 0.69 to 0.98 N·m.

#### Mounting Holes



- Connect nickel-plated solderless terminals to the TZ. Each terminal must be secured on the TZ with M3.5 nut.
- Make sure that the ceramic case is free of metal powder or other impurities.

#### Operation

- Do not modify the Actuator and change the operating position.
- Make sure that the switching speed is not extremely slow or do not use the Switch so that the pushbutton will be set to a position between the FP and OP.
- Make sure that the pin-type pushbutton and the switching stroke are on the same vertical line.
- Make sure that the switching frequency or speed is within the specified range.
  1. If the switching speed is extremely slow, the contact may not be switched smoothly, which may result in a contact failure or contact welding.
  2. If the switching speed is extremely fast, switching shock may damage the Switch soon. If the switching frequency is too high, the contact may not catch up with the speed.

The rated permissible switching speed and frequency indicate the switching reliability of the Switch.

The life of a Switch is determined at the specified switching speed. The life varies with the switching speed and frequency even when they are within the permissible ranges. In order to determine the life of a Switch model to be applied to a particular use, it is best to conduct an appropriate durability test on some samples of the model under actual conditions.

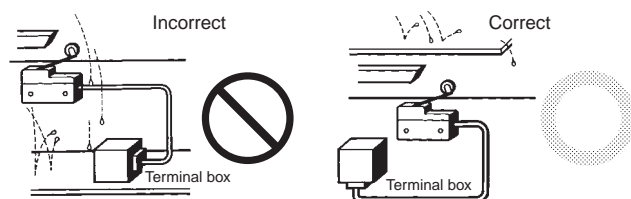
- Make sure that the actuator travel does not exceed the permissible OT position. The operating stroke must be set to 70% to 100% of the rated OT.

### Precautions for Correct Use

#### Mounting Location

- Do not use the switch alone in atmospheres such as flammable or explosive gases. Arcing and heat generation associated with switching may cause fires or explosions.

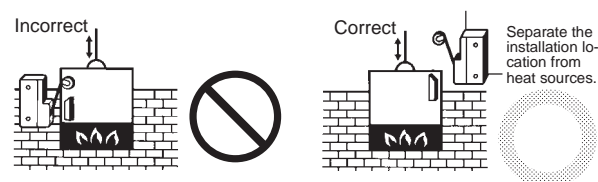
- Switches are generally not constructed with resistance against water. Use a protective cover to prevent direct spraying if the switch is used in locations subject to splashing or spurting oil or water, dust adhering.



- Install the switch in a location that is not directly subject to debris and dust from cutting. The actuator and the switch body must be protected from accumulated cutting debris and dirt.



- Do not use the switch in locations subject to hot water (greater than 60°C) or in water vapor.
- Do not use the switch outside the specified temperature and atmospheric conditions.  
The permissible ambient temperature depends on the model. (Refer to the specifications in this catalog.) Sudden thermal changes may cause thermal shock to distort the switch and result in faults.



- Mount a cover if the switch is to be installed in a location where worker inattention could result in incorrect operation or accidents.



- Subjecting the switch to continuous vibration or shock may result in contact failure or faulty operation due to abrasion powder and in reduced durability. Excessive vibration or shock will cause the contacts to operate malfunction or become damaged. Mount the switch in a location that is not subject to vibration or shock and in a direction that does not subject the switch to resonance.
- If silver contacts are used with relatively low frequency for a long time or are used with microloads, the sulfide coating produced on the contact surface will not be broken down and contact faults will result. Use a microload switch that uses gold contacts.
- Do not use the switch in atmospheres with high humidity or heat or in harmful gases, such as sulfide gas (H<sub>2</sub>S, SO<sub>2</sub>), ammonia gas (NH<sub>3</sub>), nitric acid gas (HNO<sub>3</sub>), or chlorine gas (Cl<sub>2</sub>). Doing so may impair functionality, such as with damage due to contacting faults or corrosion.
- The switch includes contacts. If the switch is used in an atmosphere with silicon gas, arc energy may cause silicon oxide (SiO<sub>2</sub>) to accumulate on the contacts and result in contact failure. If there is silicon oil, silicon filling, silicon wiring, or other silicon products in the vicinity of the switch, use a contact protection circuit to limit arcing and remove the source of the silicon gas.

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