Panasonic
ideas for life

SAFETY INTERLOCK SWITCH CONSTRUCTED WITH DUAL RESTORATION SPRINGS

GW (AV1) SWITCHES

FEATURES

- **8mm .315inch or more is assured as insulation distance between contacts (Snap-in mounting 2 Form A and 3 Form A type)**
- **Durability of 100,000 times (16A 380V AC) is assured for UL interlock circuit**
- **Constructed with easy-to-connect terminals**

Terminal specifications is .250 Quick-Connect (based on DIN standards) Connection can be made with insulating sleeve on connecting lug

- **UL/CSA/VDE/SEMKO approved**

TYPICAL APPLICATIONS

1. Office equipment
- Copies
- Facsimiles
- Projectors

2. Home appliances
- Microwave ovens
- Refrigerators

ORDERING INFORMATION

Ex. AV1 | 4 | 0 | 5

Type of switch	Contact arrangement	Mounting method
AV1: GW switch	1: 3 Form A (contact gap: 8 mm .315 inch) 2: 2 Form A (contact gap: 8 mm .315 inch) 3: 2 Form A (contact gap: 6 mm .236 inch) 4: 1 Form A 1 Form B 5: 1 Form B 6: 1 Form A	0: Screw mounting 1: Snap-in mounting type 2: Snap-in mounting type with button guard

Remarks: 1. When ordering UL/CSA (16 A 380 V AC, 1/2HP 125/250 V AC, operating cycle: 6×10^3) VDE·SEMKO·TÜV approved types, add suffix 9 to the type No., for example AV14059.
2. When ordering UL/CSA (16 A 380 V AC, operating cycle: 6×10^6) VDE and SEMKO approved types, add suffix 3 to the type No., for example AV14053.

PRODUCT TYPES

Type				Part number
Mounting method	Button guard	Contact arrangement	Contact gap mm inch	
Screw mounting	Without	1 Form A	Min. 6 .236	AV1605
		1 Form B	Min. 3 .118	AV1505
		1 Form A 1 Form B	Max. 3 .118	AV1405
		2 Form A	Min. 6 .236	AV1305
Snap-in mounting	Without	2 Form A	Min. 8 .315	AV1215
		3 Form A	Min. 8 .315	AV1115
	With	2 Form A	Min. 8 .315	AV1225
		3 Form A	Min. 8 .315	AV1125

SPECIFICATIONS

1. Contact rating

No. of load	Resistive load (cos $\phi \fallingdotseq 1$)	VDE motor load (cos $\phi \fallingdotseq 0.6$)
125V AC	16A	4A
250V AC	16A	4A
380V AC	16A	4A

* The VDE motor load rating is in accordance with VDE 0630 motorload rating which designates an inrush current switching capability of 6 times the indicating rating.

2. Characteristics

Expected life	Mechanical (at 60 cpm)	10^6
	Electrical (at 20 cpm, operating speed: 10mm/sec.)	10^5 (16A 380V AC) 5×10^4 (16(4)A 380V~)
Insulation resistance		Min. 100MΩ at 500V DC
Dielectric strength	Between terminals	2,000 Vrms for 1 min.
	Between terminals and other exposed metal parts	2,500 Vrms for 1 min.
	Between terminals and ground	2,000 Vrms for 1 min.
Initial contact resistance, max. (by voltage drop at 1A 6 to 8V DC)		Max. 100mΩ
Temperature rise		Initial 45 deg. Max., After test 55 deg. Max.
Vibration resistance		10 to 55Hz at double amplitude of 1.5mm (Contact opening Max. 1 msec.)
Shock resistance		Min. 294 m/s^2
Actuator strength		49 N for 1 minute
Tensile terminal strength		Min. 147 N
Min. operating speed		10 to 300mm/sec.
Max. operating cycle rate		60 cpm
Temperature resistance		–40°C to –45°C –40°F to –49°F: 48 hours, +80°C to +90°C +176°F to +194°F: 48 hours
Ambient temperature		–25 to +85°C –13 to +185°F (Not freezing below 0°C 32°F)
Flame retardancy		UL 94V-1
Tracking resistance (CTI)		Min. 175

*Remark:Test condition and judgement are complying with "JIS C4505", "EN61058" and "UL1054".

3. Operating characteristics

1) Screw mounting type

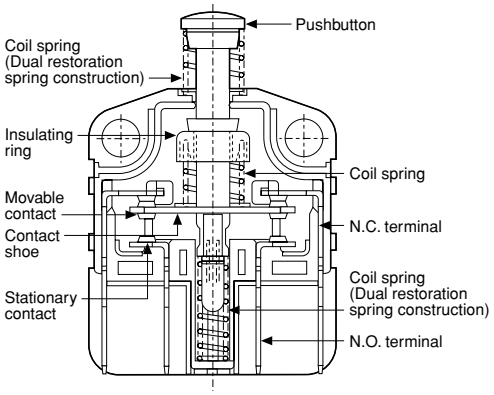
Contact arrangement	Max. O.F.	Max. T.F. pushbutton position: 10mm .394inch	Max. F.P.	O.P.	Min. T.T.P.	Min. O.T.
1 Form A	(N.O. contact to ON) 4.90N	6.37N	16.6mm .654inch	(N.O. contact to ON) 12.7±0.4mm .500±.016inch	10mm .394inch	2.1mm .083inch
1 Form B	(N.C. contact to OFF) 2.94N	7.35N	15.3mm .602inch	(N.C. contact to OFF) 14.9±0.4mm .587±.016inch	10mm .394inch	4.3mm .169inch
1 Form A 1 Form B	(N.O. contact to ON) 5.88N	7.35N	15.3mm .602inch	(N.O. contact to ON) 12.7±0.4mm .500±.016inch	10mm .394inch	2.1mm .083inch
1 Form A 1 Form B	(N.C. contact to OFF) 2.94N	7.35N	15.3mm .602inch	(N.C. contact to OFF) 14.9±0.4mm .587±.016inch	10mm .394inch	2.1mm .083inch
2 Form A	(N.O. contact to ON) 7.85N	9.81N	16.6mm .654inch	(N.O. contact to ON) 12.7±0.4mm .500±.016inch	10mm .394inch	2.1mm .083inch

2) Snap-in mounting type

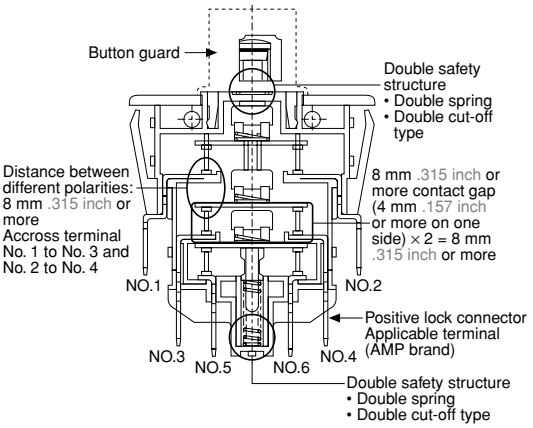
Contact arrangement	Max. O.F.	Max. T.F. pushbutton position: 10mm .394inch	Max. F.P.	O.P.	Min. T.T.P.	Min. O.T.
2 Form A	(N.O. contact to ON) 7.85N	9.81N	14mm .551inch	(N.O. contact to ON) 9.3±0.4mm .366±.016inch	7.5mm .295inch	2.1mm .083inch
3 Form A	(N.O. contact to ON) 9.81N	14.7N	14mm .551inch	(N.O. contact to ON) 9.3±0.4mm .366±.016inch	7.5mm .295inch	2.1mm .083inch

CONSTRUCTION

[Screw mounting type (1 Form A 1 Form B)]



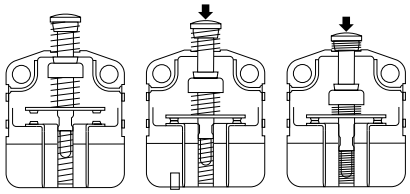
[Snap-in mounting type (3 Form A)]



CONTACT OPERATION CHART

• 1 Form A

1. Free position
2. Operating position
3. Total travel position

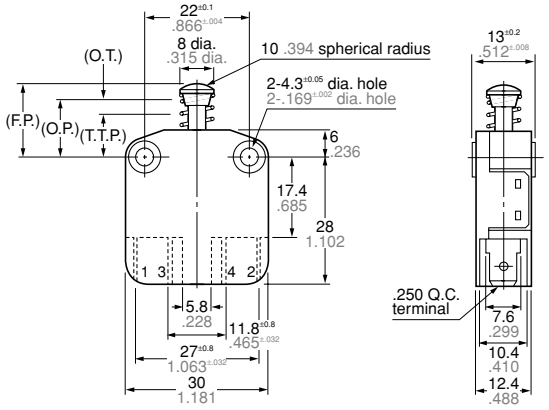


DIMENSIONS

mm inch General tolerance ±0.1 ±.004

1. Screw mounting type

1 Form A, 1 Form B, 1 Form A 1 Form B



Contact gap

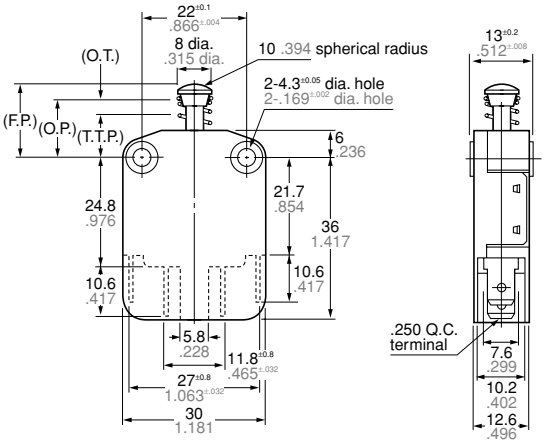
1 Form A: Min. 6mm .236inch

1 Form B: Min. 3mm .118inch

1 Form A 1 Form B: Max. 3mm .118inch

Remarks: Terminal no. 3 & 4 are for 1 Form A Terminal no. 1 & 2 are for 1 Form B.

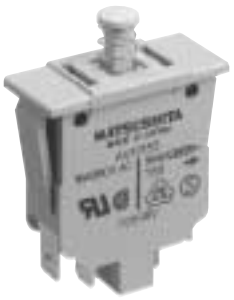
2 Form A



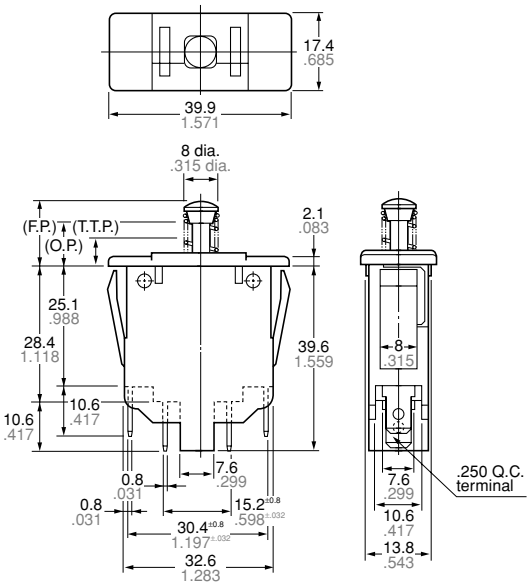
Contact gap
2 Form A: Min. 6mm .236inch

2. Snap-in mounting type

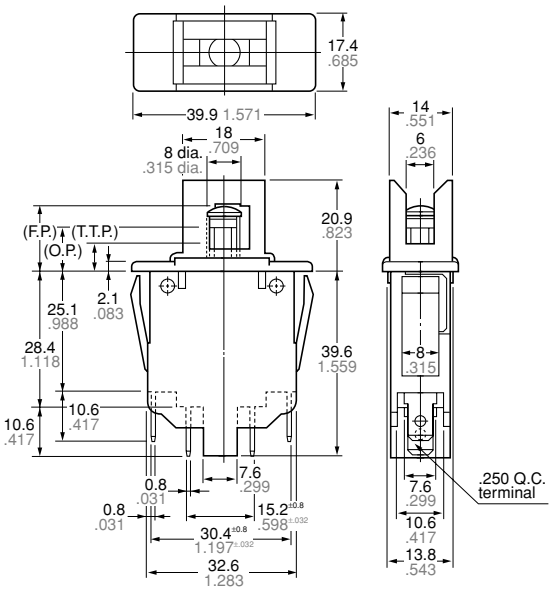
2 Form A



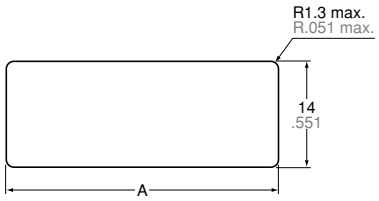
2 Form A type without button guard



2 Form A type with button guard



Recommended panel opening dimensions (common)

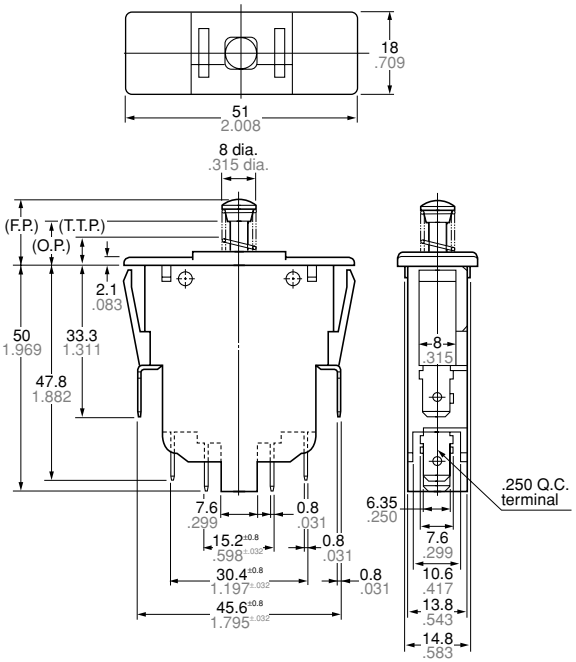


Panel thickness	1.0 .039	2.5 .098
Dimension A	36.7 1.445	37.7 1.484

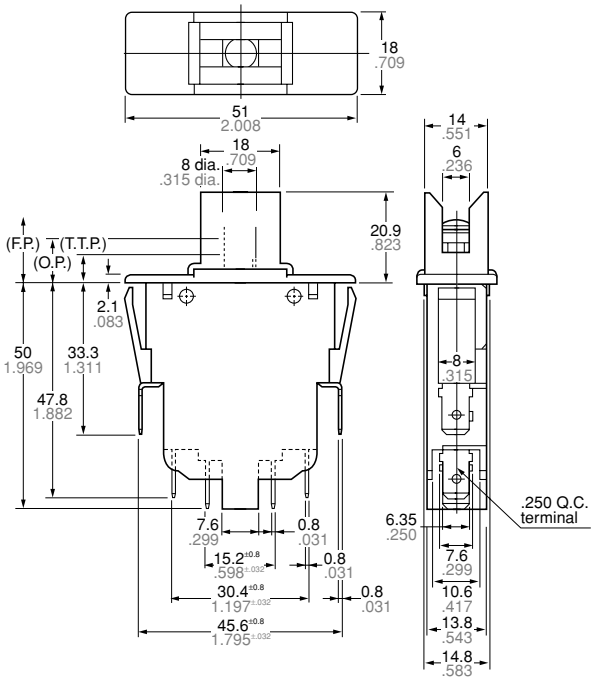
Contact gap
2 Form A: Min. 8mm .315inch

3 Form A

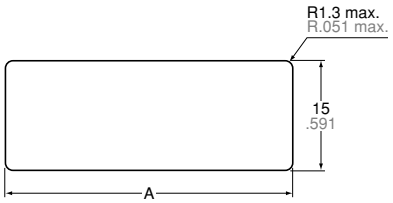
3 Form A type without button guard



3 Form A type with button guard



Recommended panel opening dimensions (common)



Panel thickness	1.0 .039	2.5 .098
Dimension A	47.0 1.850	47.3 1.862

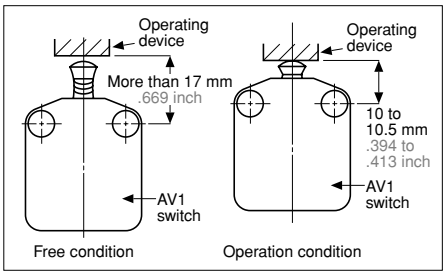
Contact gap
3 Form A: Min. 8mm .315inch

NOTES

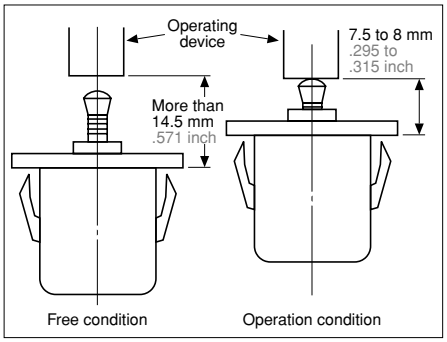
1. Switch mounting
Mount the switch to a smooth surface using M4 screws. Tighten the screws with 0.3 to 0.5 N•m {3 to 5 kg•cm} torque. To prevent loosening of the mounting screws, it is recommended that spring washers be used in combination with adhesive material for locking the screws.

2. Adjustment of the operating device:
With respect to the position of the operating device and the switch body, set the position as indicated in the condition on the right. If this condition is exceeded, the mechanical and electrical performance will be impaired. In addition, the force applied by the operating device should be in a perpendicular direction. Even if the pushbutton is used in the full total travel position, there will be no influence on the life of the switch.

Screw mounting type



Snap-in mounting type



3. Confirming insulating distance:
Before mounting and wiring, the insulating distance between terminals and between terminals and ground should be checked for assurance of proper distance. With respect to the terminal connections, it is recommended that receptacles with insulating sleeves be used.
Also, consideration should be given to the wiring not to apply force to the terminal section normally.

4. Avoid using GW switches in the following conditions:
• Locations where hydrogen sulfide gas or other corrosive gases exist.
• Locations where gasoline, thinner, or other inflammable or explosive gases exist.
• Locations where there are dust and refuse.
• For operation where the perpendicular operating speed is less than 10mm/sec.
• For operation frequency of make/break exceeding 60 cpm.
• For ambient temperatures exceeding the range of –25°C to +85°C +13°F to +185°F.
• For ambient humidity exceeding 85% R.H.
• For use in a silicon atmosphere.

5. For use of AV1405 (1 Form Z type):
For the type AV1405, the air distance between the N.O. and N.C. contacts is less than the required value of VDE. The N.O. and the N.C. contacts can carry only the same electric potential.