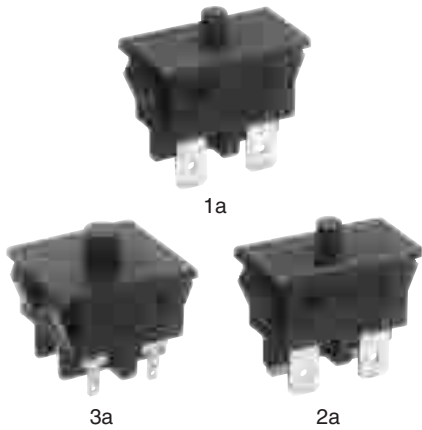


SAFETY INTERLOCK SWITCH SMALL SIZE & LIGHT FORCE

AGX (GX) SWITCHES



FEATURES

- Constructed with dual restoration springs and double cut-off for safety
- Contact gap of greater than 4mm (Conforming to IEC 950)
- As for 3 Form A type, combination of power contact and signal contact is available
- UL/CSA/SEMKO/TÜV/VDE approved

TYPICAL APPLICATIONS

- Door interlock of copiers, printers, facsimiles
- Door interlock of other compact appliances

We have introduced Cadmium free type products to reduce the material which is not good for our environment. (The suffix "F" should be added to the part number.) If you are still using Cadmium containing parts, which don't have "F" on the suffix of the part number, please use Cadmium free parts from now on. The life of the Cadmium free parts may be shorter than the Cadmium containing parts based on the load condition, so please evaluate the Cadmium free parts with your actual application before use.

RoHS Directive compatibility information
<http://www.nais-e.com/>

ORDERING INFORMATION

Ex. AGX F

Product Name	Contact arrangement	Capacity and mounting method	Terminals	Contact
GX	1: 1 Form A Power switching contact 2: 2 Form A Power switching contact 3: 3 Form A Power switching contact 6: 1 Form A Power switching contact and 2 Form A Signal switching contact 7: 2 Form A Power switching contact and 1 Form A Signal switching contact	0: Standard type 10.1 A (Snap-in mounting)	5: .250 Quick-connect terminal (O.T. 2 mm) 6: .250 Quick-connect terminal (O.T. 4 mm)	F: Cadmium free

PRODUCT TYPES

Rating	Overtravel (O.T.) Min. mm	Contact arrangement	Switching timing		Part number	
			1st ON	2nd ON		
Standard type 10.1A 250V AC	2	1 Form A Power switching contact	—	—	AGX105F	
		2 Form A Power switching contact	—	—	AGX205F	
		1 Form A Power switching contact	—	—	AGX106F	
		2 Form A Power switching contact	—	—	AGX206F	
	4	3 Form A	3 Form A Power switching contact	3a power	—	AGX306F
			1 Form A Power switching contact 2 Form A Signal switching contact	1a power	2a signal	AGX606F
			2 Form A Power switching contact 1 Form A Signal switching contact	2a power	1a signal	AGX706F

SPECIFICATIONS

1. Contact rating

Number of contact	Resistive load ($\cos \phi \geq 1$)	Motor load* (EN61058-1) ($\cos \phi \geq 0.6$)
Standard type power switching contact	10.1A 125V AC 10.1A 250V AC 6A 30V DC 3A 48V DC (3 Form A type only)	3A 125V AC 3A 250V AC
Signal switching contact (3 Form A only)	0.1A 48V DC Contact Low-level circuit: 1mA 5V DC	—

Remark: Motor load designates an inrush current switching capability of 6 times the indicated rating

2. Characteristics

Type	Standard type
Expected life	10 ⁶ min.
Mechanical (at 60 cpm) Electrical (at 20 cpm, operating speed: 10mm/sec.)	10 ⁵ (at 10.1A 250V AC)
Insulation resistance	100M Ω at 500V DC
Dielectric strength	2,000Vrms for 1 minute
Between terminals	2,500Vrms for 1 minute
Between terminals and other exposed metal parts	2,000Vrms for 1 minute
Between terminals and ground	2,000Vrms for 1 minute
Initial contact resistance	100m Ω Max. (by voltage drop at 1A, 6 to 8V DC)
Temperature rise (terminal portion)	Initial 45 deg. Max., After test 55 deg. Max.
Vibration resistance	10 to 55Hz at single amplitude of 0.75mm
Shock resistance	Min. 294m/s ²
Actuator strength	49N for 1 minute (For operating direction)
Tensile terminal strength	Min. 147N (Pulling for operating direction)
Allowable operating speed	Min. 10 to 300mm/second
Allowable operating cycle rate	60 cpm
Temperature resistance	-40°C to -45°C: 48 hours, +80°C to +90°C: 48 hours
Ambient temperature	-25°C to +85°C (Not freezing nor condensing)
Flame retardancy	Min. UL 94V-1
Tracking resistance (CTI)	Min. 175
Contact material	AgCuO alloy

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

3. Operating characteristics

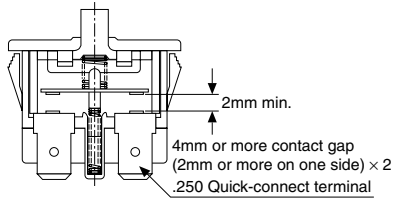
Contact arrangement	Part number	Operating force (O.F.) Max.	Total operating force (T.F.) Max. Push button position: 2.4mm	Free position (F.P.) Max. mm	Operating position (O.P.) mm	Total travel position (T.T.P.) mm	Over travel (O.T.) Min. mm	
Standard type 10.1A 250V AC	1 Form A	AGX105	3.92 N	4.90 N	8	4.8±0.4	2.4	2.0
	2 Form A	AGX205	3.92 N	4.90 N	8	4.8±0.4	2.4	2.0
	1 Form A	AGX106	3.92 N	6.86 N	10	7.0±0.4	2.4	4.0
	2 Form A	AGX206	3.92 N	6.86 N	10	7.0±0.4	2.4	4.0
	3 Form A	AGX306	2.94 N	5.88 N	10	7.0±0.4	2.4	4.0

Remark: With the 3 Form A type sequence operation type, the specifications for the contact where the operation position turns ON first are as per the above table. However, the specifications for the contact where the operation position turns ON later are delayed by approximately 0.8 mm compared with the above table.

CONSTRUCTION

Dual safety construction

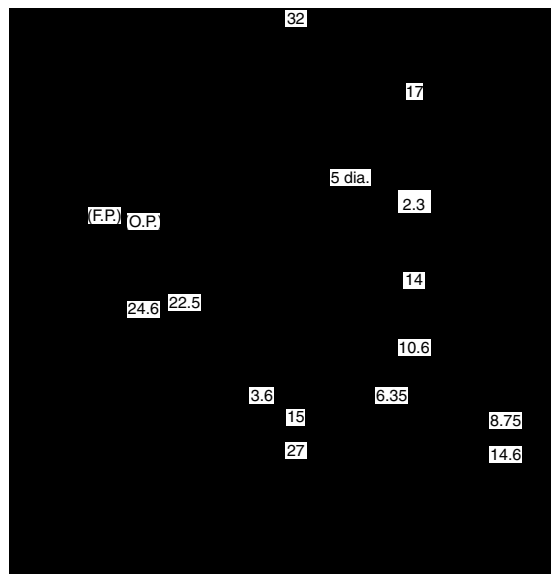
- Dual restoration spring
- Double cut-off type



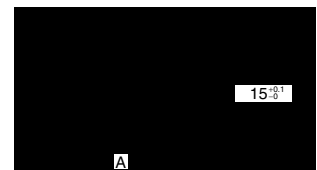
DIMENSIONS

mm General tolerance: ±0.4

1 Form A



Hole cutting dimension



2 Form A



Panel thickness	1.0 to 1.75	1.75 to 2.5
Dimension A	30.2 ^{+0.1}	30.5 ^{+0.1}

(Copper is standard as panel material)

Remark: 1 Form A type does not have terminal No.1 nor No.2

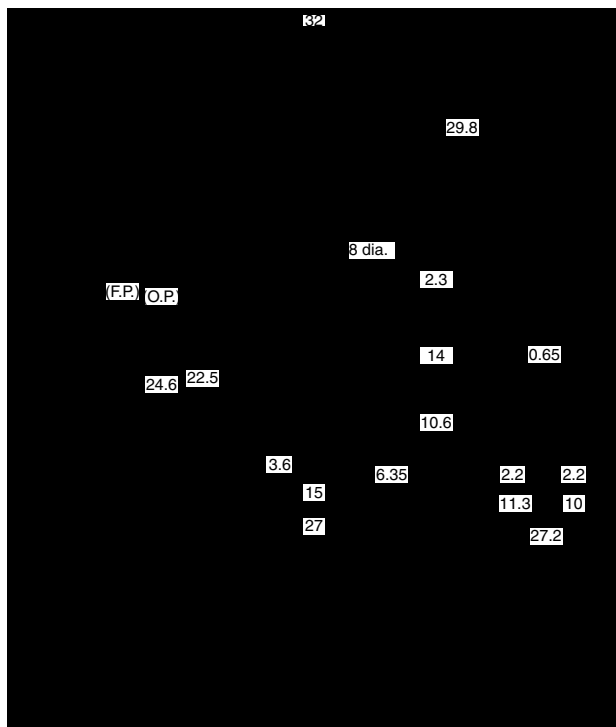
3 Form A



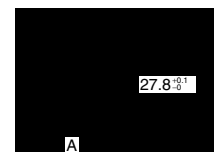
Power switching contact



Signal switching contact



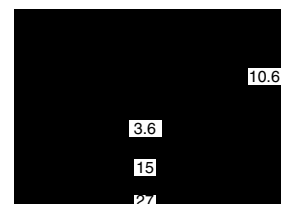
Hole cutting dimension



Panel thickness	0.8 to 1.75	1.75 to 2.5
Dimension A	30.2 ^{+0.1}	30.5 ^{+0.1}

(Copper is standard as panel material)

- Signal switching contact



Remark: Power switching contact type has .250 Quick-connect terminal and signal switching contact type has .110 Quick-connect terminal.

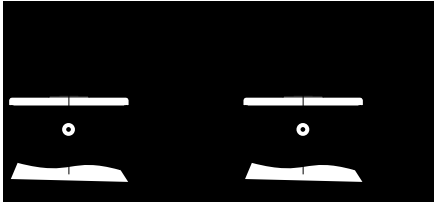
NOTES

1. Switch mounting

Mount the switch with the hole cutting dimensions shown in the drawing.

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.



3. Confirming insulating distance

Before mounting and wiring, the insulating distance between terminals and between the 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 or "Positive Lock Connector*" be used. Also consideration should be given to the wiring not to apply force to the terminal section normally.

*Registered by AMP, Ltd.

4. Regarding fastening lead wires to terminals

Use .250 receptacle (terminal thickness 0.8mm) or .110 receptacle (terminal thickness 0.5mm) should be used for connection. Make sure the sockets are straight. If they are skewed, the terminals will require excessive insertion force. The insertion force varies according to manufacturer's specifications. Check it for

the sockets you are using.

5. Material of the panel

Steel sheet is recommended as the panel material. When using soft material, confirm the condition for actual use.

6. Quality check under actual loading conditions

To improve reliability, check the switch under actual loading conditions. Avoid any situation that may adversely affect switching performance.

7. Avoid using and keeping switches in the following conditions.

- In corrosive gases
- In a dusty environment
- Where silicon atmosphere prevails

REFERENCE

1. Outline of UL1054 test

Overload test

Standard type: 12.5A 250V AC
(Power factor 0.75 to 0.8)

Endurance test

Standard type: 10A 250V AC
(Power factor 0.75 to 0.8)

After testing, temperature rise of terminals should be less than 30°C and no abnormality should be observed in characteristics.

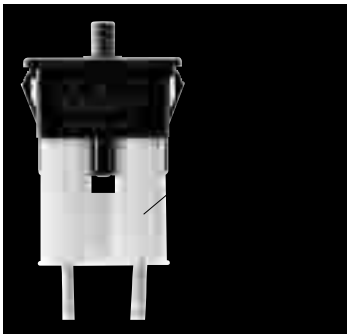
2. Outline of EN61058-1 test

After switching 25,000 times on the above load condition at both 85⁺⁵₀°C and 25±10°C, temperature rise of terminals should be less than 55°C and no abnormality should be observed in characteristics.



INTRODUCTION OF CONNECTORS (made by Nippon Tanshi co.,Ltd)

1. For 2 Form A power switching contact type



Applicable AGX switch part No.:
AGX205F, AGX206F

* Housing

Model number: N1620-4204

* Receptacle

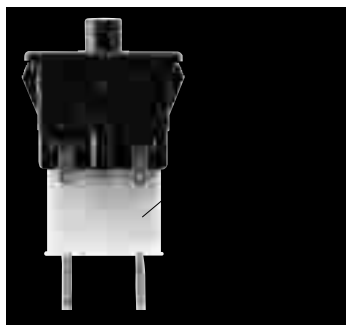
Model numbers

17168-2 (for narrow wires, post-plated product)

17168-M2 (for narrow wires, wood veneer plated product)

172131-M2 (for thick wires)

2. For 2 Form A power switching contact type of 2 Form A power switching contact + 1 Form A signal switching contact



Applicable AGX switch part No.:
AGX706F

* Housing

Model number: N3220-4204

* Receptacle

Model numbers

17901-M2, 17902-M2, 17903-M3 (wire size differences)

Remark: Please consult us if you need above connectors.



FEATURES

- 8mm 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 (10.1A 250V 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 (ENEC) approved

TYPICAL APPLICATIONS

- Office equipment**
 - Copiers
 - Facsimiles
 - Projectors
- Home appliances**
 - Microwave ovens
 - Refrigerators

We have introduced Cadmium free type products to reduce the material which is not good for our environment. (The suffix "F" should be added to the part number.) If you are still using Cadmium containing parts, which don't have "F" on the suffix of the part number, please use Cadmium free parts from now on. The life of the Cadmium free parts may be shorter than the Cadmium containing parts based on the load condition, so please evaluate the Cadmium free parts with your actual application before use.

RoHS Directive compatibility information
<http://www.nais-e.com/>

ORDERING INFORMATION

Ex. AV1 4 6 5 3 F

Type of switch	Contact arrangement	Mounting method	Agency standard	Contact
AV1: GW switch	1: 3 Form A (contact gap: 8 mm) 2: 2 Form A (contact gap: 8 mm) 3: 2 Form A (contact gap: 6 mm) 4: 1 Form A 1 Form B 5: 1 Form B 6: 1 Form A	6: Screw mounting (10.1 A) 7: Snap-in mounting type (10.1 A) 8: Snap-in mounting type with button guard (10.1 A)	3: UL/CSA/VDE (ENEC) (10.1 A 250 V AC 1 × 10 ⁵)	F: Cadmium free

PRODUCT TYPES

Mounting method	Button guard	Type		Part number
		Contact arrangement	Contact gap mm	
Screw mounting	Without	1 Form A	Min. 6	AV16653F
		1 Form B	Min. 3	AV15653F
		1 Form A 1 Form B	Max. 3	AV14653F
		2 Form A	Min. 6	AV13653F
Snap-in mounting	Without	2 Form A	Min. 8	AV12753F
		3 Form A	Min. 8	AV11753F
	With	2 Form A	Min. 8	AV12853F
		3 Form A	Min. 8	AV11853F

SPECIFICATIONS

1. Contact rating

No. of load	Resistive load (cos ϕ 1)	VDE motor load (cos ϕ 0.6)
125V AC	10.1A	3A
250V AC	10.1A	3A

* 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 (10.1A 250V AC) 5 × 10 ⁴ (10(3)A 250V~)
Insulation resistance		Min. 100M Ω 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. 100m Ω
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: 48 hours, +80°C to +90°C: 48 hours
Ambient temperature		-25 to +85°C (Not freezing below 0°C)
Flame retardancy		UL 94V-1
Tracking resistance (CTI)		Min. 175
Contact material		AgCuO alloy

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

3. Operating characteristics

1) Screw mounting type

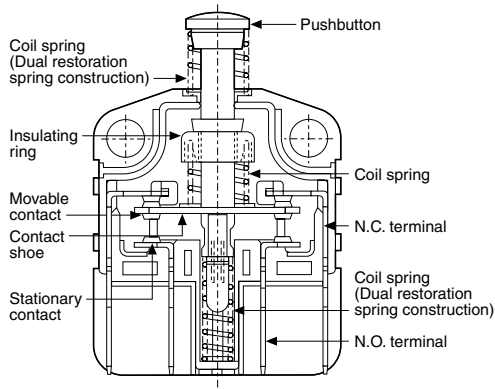
Contact arrangement	Max. O.F.	Max. T.F. pushbutton position: 10mm	Max. F.P.	O.P.	Min. T.T.P.	Min. O.T.
1 Form A	(N.O. contact to ON) 4.90N	6.37N	16.6mm	(N.O. contact to ON) 12.7±0.4mm	10mm	2.1mm
1 Form B	(N.C. contact to OFF) 2.94N	7.35N	15.3mm	(N.C. contact to OFF) 14.9±0.4mm	10mm	4.3mm
1 Form A 1 Form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

2) Snap-in mounting type

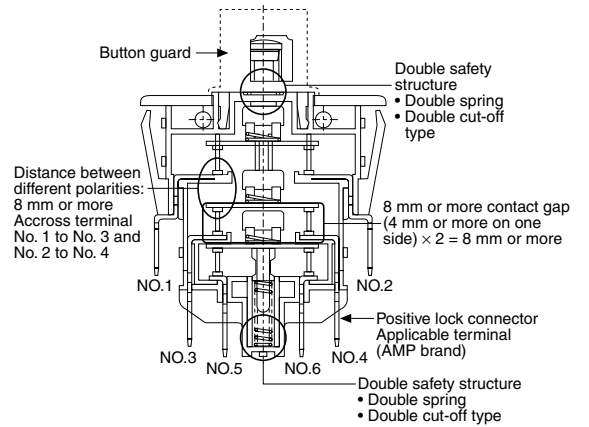
Contact arrangement	Max. O.F.	Max. T.F. pushbutton position: 10mm	Max. F.P.	O.P.	Min. T.T.P.	Min. O.T.
2 Form A	(N.O. contact to ON) 7.85N	9.81N	14mm	(N.O. contact to ON) 9.3±0.4mm	7.5mm	2.1mm
3 Form A	(N.O. contact to ON) 9.81N	14.7N	14mm	(N.O. contact to ON) 9.3±0.4mm	7.5mm	2.1mm

CONSTRUCTION

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



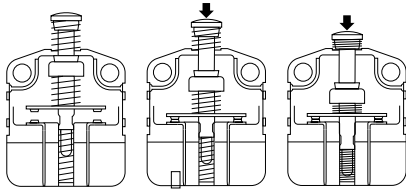
[Snap-in mounting type (3 Form A)]



CONTACT OPERATION CHART

• 1 Form A

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

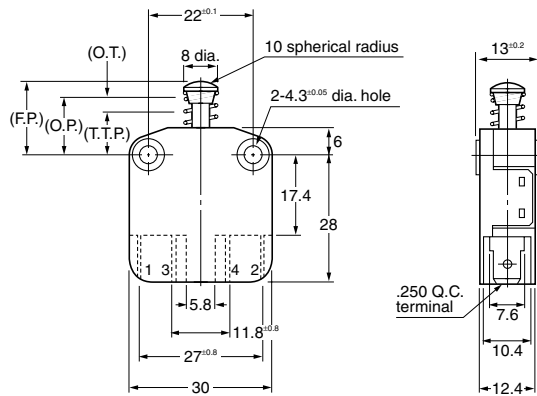


DIMENSIONS

mm General tolerance: ±0.1

1. Screw mounting type

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



Contact gap

1 Form A: Min. 6mm

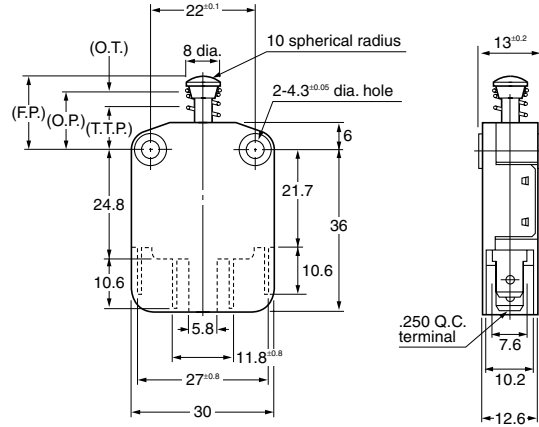
1 Form B: Min. 3mm

1 Form A 1 Form B: Max. 3mm

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

AV1

2 Form A



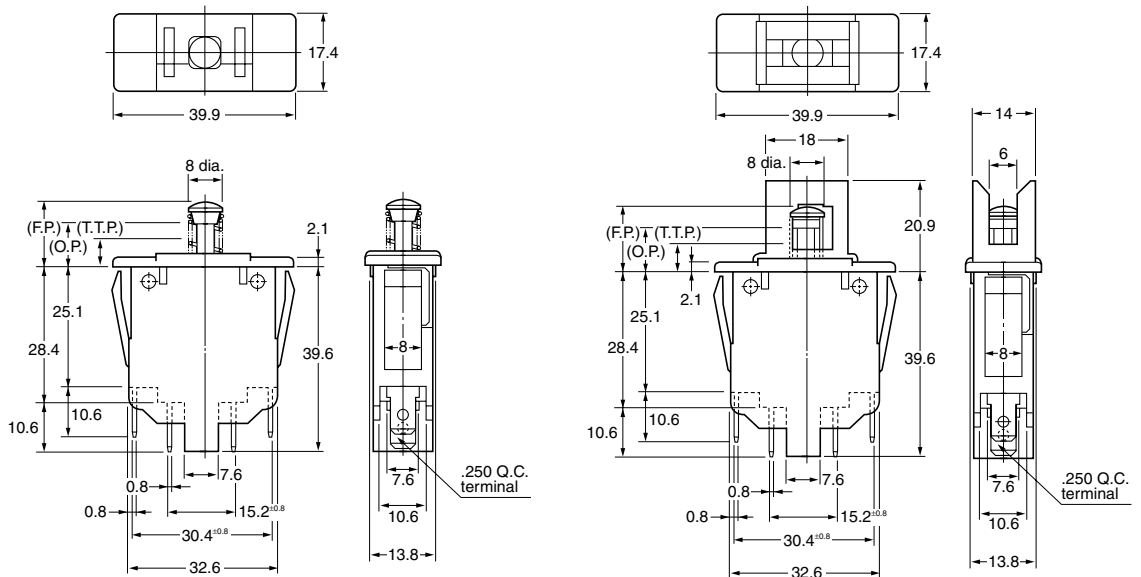
Contact gap
2 Form A: Min. 6mm

2. Snap-in mounting type

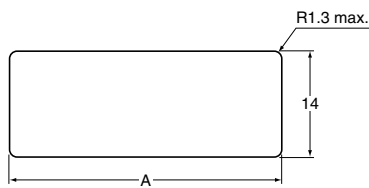
2 Form A type without button guard

2 Form A type with button guard

2 Form A



Recommended panel opening dimensions (common)



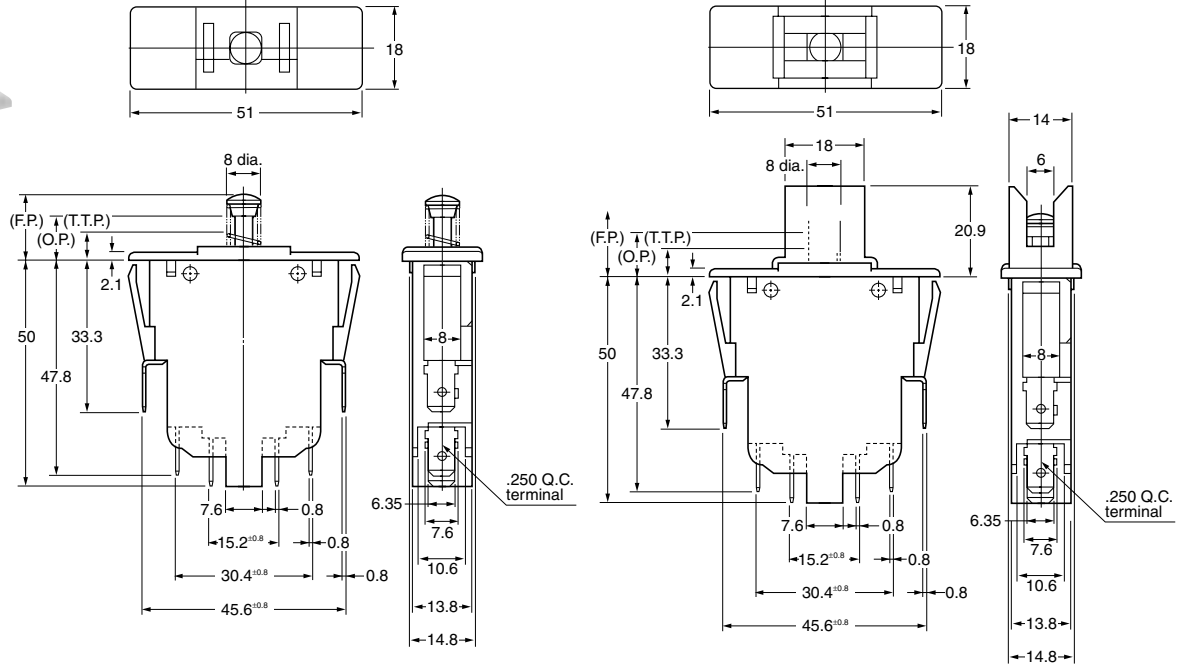
Contact gap
2 Form A: Min. 8mm

Panel thickness	1.0	2.5
Dimension A	36.7	37.7

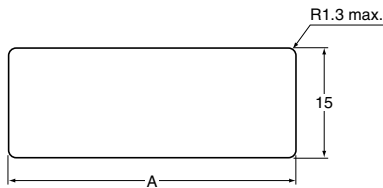
3 Form A

3 Form A type without button guard

3 Form A type with button guard



Recommended panel opening dimensions (common)



Contact gap
3 Form A: Min. 8mm

Panel thickness	1.0	2.5
Dimension A	47.0	47.3

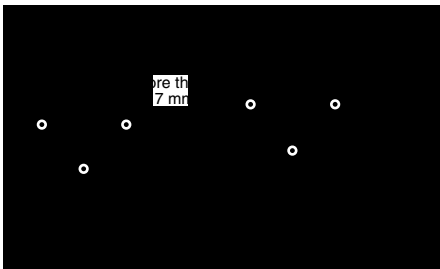
NOTES

1. Switch mounting

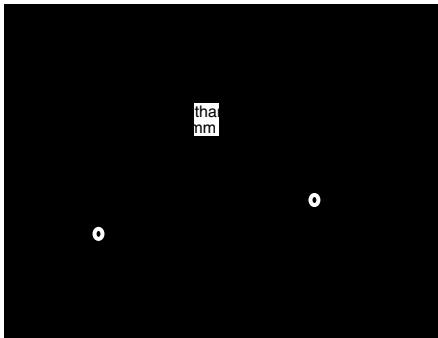
Mount the switch to a smooth surface using M4 screws. Tighten the screws with 0.3 to 0.5 N-m {3 to 5 kg-cm} torque. To prevent loosening of the mounting screws, it is recommended that spring washers be used in combination with adhesive material for locking the screws.

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 AV1 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 is 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.
- For ambient humidity exceeding 85% R.H.
- For use in a silicon atmosphere.

5. For use of AV14653F (1a1b type):

For the type AV14653F, 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.