



Panasonic
ideas for life

**ULTRA-MINIATURE
SWITCHES
WITH HIGH PRECISION**

**AH1 (FJ)
SWITCHES**



FEATURES

- Integrally molded terminal block—prevents soldering flux from entering into housing
- Compact size —minimizes size of equipment
- Flat terminal shape—makes soldering easy
- Low-level circuit type available
- Self-standing PC board terminal type available

TYPICAL APPLICATIONS

- Computer mouse
- Charger unit for mobile phone
- Detection of key position for automobiles

RoHS compliant

ORDERING INFORMATION

Ex. AH 1 4 8 0 61 9

| Product Name | Terminal | Operating force by pin plunger (max.) | Actuator | Contact | Agency standard |
|--------------|---|--|---|---|-----------------|
| FJ | 4: 2.0 mm Self-standing PC board terminal with stand off 5: Straight PC board terminal with stand off 6: 2.0 mm solder terminal with stand off 7: 2.0 mm PC board right angle terminal 8: 2.0 mm PC board left angle terminal | 6: 1.47 N with stand off 8: 0.74 N with stand off | 0: Pin plunger 2: Hinge lever 4: Simulated roller lever | Nil: AgNi alloy 61: AgNi alloy + Gold-clad | 9: UL/CSA |

Remark: 2.0 mm PC board terminal straight type is available. For details, please consult us.

PRODUCT TYPES

The color of:

| Type | Color | | |
|-------------------|-------|-------|---------|
| | Body | Cap | Plunger |
| Standard | Black | Black | White |
| Low-level circuit | Black | Black | Red |

1. Self-standing PC board terminal

| Actuators | Operating force, Max. | Standard (AgNi alloy contact) | Low-level circuit (AgNi alloy + Gold-clad contact) |
|------------------------|-----------------------|-------------------------------|--|
| | | SPDT | SPDT |
| Pin plunger | 0.74 N | AH14809 | AH1480619 |
| | 1.47 N | AH14609 | AH1460619 |
| Hinge lever | 0.25 N | AH14829 | AH1482619 |
| | 0.49 N | AH14629 | AH1462619 |
| Simulated roller lever | 0.26 N | AH14849 | AH1484619 |
| | 0.54 N | AH14649 | AH1464619 |

AH1

2. Solder terminal

| Actuators | Operating force, Max. | Standard (AgNi alloy contact) | Low-level circuit (AgNi alloy + Gold-clad contact) |
|------------------------|-----------------------|-------------------------------|--|
| | | SPDT | SPDT |
| Pin plunger | 0.74 N | AH16809 | AH1680619 |
| | 1.47 N | AH16609 | AH1660619 |
| Hinge lever | 0.25 N | AH16829 | AH1682619 |
| | 0.49 N | AH16629 | AH1662619 |
| Simulated roller lever | 0.26 N | AH16849 | AH1684619 |
| | 0.54 N | AH16649 | AH1664619 |

3. Straight PC board terminal

| Actuators | Operating force, Max. | Standard (AgNi alloy contact) | Low-level circuit (AgNi alloy + Gold-clad contact) |
|------------------------|-----------------------|-------------------------------|--|
| | | SPDT | SPDT |
| Pin plunger | 0.74 N | AH15809 | AH1580619 |
| Pin plunger | 1.47 N | AH15609 | AH1560619 |
| Hinge lever | 0.25 N | AH15829 | AH1582619 |
| Hinge lever | 0.49 N | AH15629 | AH1562619 |
| Simulated roller lever | 0.26 N | AH15849 | AH1584619 |
| Simulated roller lever | 0.54 N | AH15649 | AH1564619 |

4. PC board terminal right angle

| Actuators | Operating force, Max. | Standard (AgNi alloy contact) | Low-level circuit (AgNi alloy + Gold-clad contact) |
|------------------------|-----------------------|-------------------------------|--|
| | | SPDT | SPDT |
| Pin plunger | 0.74 N | AH17809 | AH1780619 |
| Pin plunger | 1.47 N | AH17609 | AH1760619 |
| Hinge lever | 0.25 N | AH17829 | AH1782619 |
| Hinge lever | 0.49 N | AH17629 | AH1762619 |
| Simulated roller lever | 0.26 N | AH17849 | AH1784619 |
| Simulated roller lever | 0.54 N | AH17649 | AH1764619 |

5. PC board terminal left angle

| Actuators | Operating force, Max. | Standard (AgNi alloy contact) | Low-level circuit (AgNi alloy + Gold-clad contact) |
|------------------------|-----------------------|-------------------------------|--|
| | | SPDT | SPDT |
| Pin plunger | 0.74 N | AH18809 | AH1880619 |
| | 1.47 N | AH18609 | AH1860619 |
| Hinge lever | 0.25 N | AH18829 | AH1882619 |
| | 0.49 N | AH18629 | AH1862619 |
| Simulated roller lever | 0.26 N | AH18849 | AH1884619 |
| | 0.54 N | AH18649 | AH1864619 |

Remarks: 1. The appearance of right and left angle types are as below.

Right angle



Left angle



2. Standard packing: 50 pcs./tube.

3. Please consult us for the delivery schedule of PC board terminal SPST-NO type.

APPLICABLE CURRENT RANGE

| Contact | Applicable current range | | | | Max. operating force for operation (at pin plunger) | |
|---|--------------------------|-------|-----|-----|---|--------|
| | 1 mA | 0.1 A | 1 A | 3 A | 0.74 N | 1.47 N |
| Standard type (AgNi alloy) | | | ● | | ● | |
| | | | ● | | | ● |
| Low level circuit type (AgNi alloy + Gold-clad) | ● | | | | ● | |
| | ● | | | | | ● |

SPECIFICATIONS

1. Contact rating (resistive load)

| | | Standard rating | Minimum rating |
|------------------------|------------|---------------------------|-----------------------------------|
| Standard type | O.F. 0.74N | 1A 125V AC, 1A 30V DC | — |
| | O.F. 1.47N | 3A 125V AC, 2A 30V DC | — |
| Low-level circuit type | | 0.1A 125V AC, 0.1A 30V DC | 5mA 6V DC, 2mA 12V DC, 1mA 24V DC |

2. Characteristics

| Contact arrangement | Standard type | Low-level circuit type |
|---|---|---|
| Expected life (Min. operations) Electrical (at rated load, 20 cpm) (O.T.: Max.) | 3×10^4 | 10^5 |
| Expected life (Min. operations) Mechanical (at 60 cpm) (O.T.: Specified value) | O.F. 0.74 N: 10^6 O.F. 1.47 N: 5×10^5 | |
| Dielectric strength (initial) Between terminals Between terminals and other exposed parts Between terminals and ground | 600 Vrms for 1 min. 1,500 Vrms for 1 min. 1,500 Vrms for 1 min. | |
| Insulation resistance (Min. at 500V DC) | 100 M Ω | |
| Initial contact resistance | Max. 30 m Ω (by voltage drop, 1A 6 to 8V DC) | Max. 100 m Ω (by voltage drop, 0.1A 6 to 8V DC) |
| Allowable operating speed (No load) | 1 to 500 mm/sec. | |
| Max. operating cycle rate (No load) | 120 cpm | |
| Ambient temperature | -25 to +85°C (Not freezing below 0°C) | |
| Shock resistance (Pin plunger type) | Min. 294 m/s ² (Contact opening: Max. 1 msec.) | |
| Vibration resistance (Pin plunger type) | 10 to 55 Hz at single amplitude of 0.75mm (Contact opening: Max. 1 msec.) | |

3. Operating characteristics

1) Pin plunger

| 3th digit of Part No. | Operating force, Max. | Release force, Min. | Pretravel, Max. mm | Movement differential, Max. mm | Overtravel, Min. mm | Operating position mm |
|-----------------------|-----------------------|---------------------|--------------------|--------------------------------|---------------------|--|
| 6 | 0.47 N | 0.20 N | 0.5 | 0.12 | 0.25 | 7 \pm 0.3 (Distance from stand off) 5.5 \pm 0.2 (Distance from mounting hole) |
| 8 | 0.74 N | 0.098 N | | | | 7 \pm 0.3 (Distance from stand off) 5.5 \pm 0.2 (Distance from mounting hole) |

2) Hinge lever

| 3th digit of Part No. | Operating force, Max. | Release force, Min. | Pretravel, Max. mm | Movement differential, Max. mm | Overtravel, Min. mm | Operating position mm |
|-----------------------|-----------------------|---------------------|--------------------|--------------------------------|---------------------|--|
| 6 | 0.49 N | 0.049 N | 2.1 | 0.5 | 0.55 | 8.3 \pm 1.2 (Distance from stand off) 6.8 \pm 1.0 (Distance from mounting hole) |
| 8 | 0.25 N | 0.025 N | | | | 8.3 \pm 1.2 (Distance from stand off) 6.8 \pm 1.0 (Distance from mounting hole) |

3) Simulated roller lever

| 3th digit of Part No. | Operating force, Max. | Release force, Min. | Pretravel, Max. mm | Movement differential, Max. mm | Overtravel, Min. mm | Operating position mm |
|-----------------------|-----------------------|---------------------|--------------------|--------------------------------|---------------------|---|
| 6 | 0.54 N | 0.039 N | 2.1 | 0.5 | 0.5 | 11.0 \pm 1.2 (Distance from stand off) 9.5 \pm 1.0 (Distance from mounting hole) |
| 8 | 0.26 N | 0.020 N | | | | 11.0 \pm 1.2 (Distance from stand off) 9.5 \pm 1.0 (Distance from mounting hole) |

AH1

DATA

Gold-clad type

Range of low-level current voltage



CONTACT ARRANGEMENT



DIMENSIONS

The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e>

1. Self-standing PC board terminal (Standard type)

Pin plunger

mm

CAD Data



PC board pattern



| | | |
|--------------------------------|---------------------------------|---------|
| Pretravel, Max. mm | 0.5 | |
| Movement differential, Max. mm | 0.12 | |
| Overtravel, Min. mm | 0.25 | |
| Operating position | Distance from mounting hole, mm | 5.5±0.2 |
| | Distance from standoff, mm | 7±0.3 |

Hinge lever

CAD Data



PC board pattern



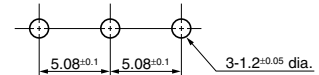
| | | |
|--------------------------------|---------------------------------|---------|
| Pretravel, Max. mm | 2.1 | |
| Movement differential, Max. mm | 0.5 | |
| Overtravel, Min. mm | 0.5 | |
| Operating position | Distance from mounting hole, mm | 6.8±1.0 |
| | Distance from standoff, mm | 8.3±1.2 |

Simulated roller lever

CAD Data



PC board pattern



| | | |
|--------------------------------|---------------------------------|----------|
| Pretravel, Max. mm | 2.1 | |
| Movement differential, Max. mm | 0.5 | |
| Overtravel, Min. mm | 0.5 | |
| Operating position | Distance from mounting hole, mm | 9.5±1.0 |
| | Distance from standoff, mm | 11.0±1.2 |

2. Solder terminal

Pin plunger

CAD Data

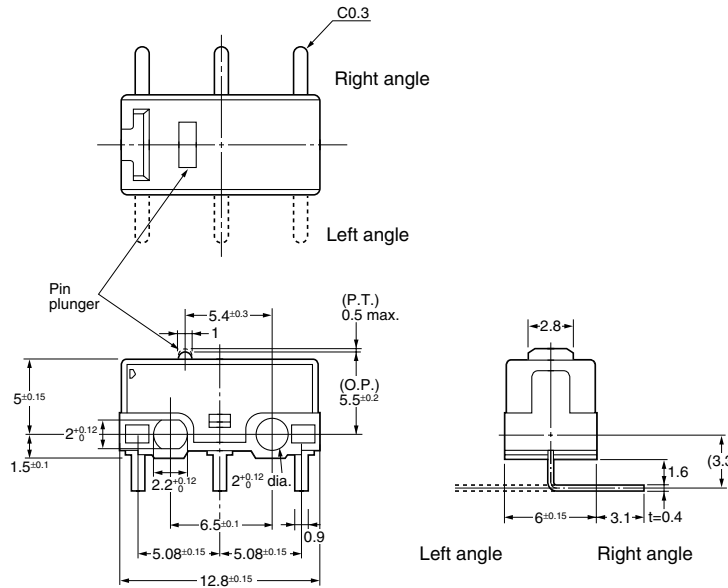
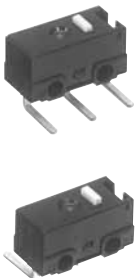


Remark: As for other actuator types, dimensions are the same as those of corresponding standard PC board terminal type.

3. PC board terminal (Right/Left angle type)

Pin plunger

CAD Data



Remark: As for other actuator types, dimensions are the same as those of corresponding standard PC board terminal type.

NOTES

1. Fixing

- 1) Use 2mm mounting screws to attach switches with Max. 0.098 N·m torque. Use of screw washers or adhesive lock is recommended.
- 2) When the operation object is in the free position, force should not be applied directly to the actuator or to the pin plunger. Also force should be applied to the pin plunger from vertical direction to the switch.
- 3) In setting the movement after operation, the over-travel should be set from 70% to 100%. Setting the movement less than 70% may cause degrading of the electrical mechanical performance.

2. When specifying AH1 switches, allow ±20% to the listed operating and release forces.

3. Soldering operation

Manual soldering should be accomplished within 3 seconds with max. 350°C iron. Terminal portions must not be moved in min. 1 minute after soldering. Also no tensile strength of lead wires should be applied to terminals.

4. When switching low-level circuits, AH1 low-level circuit type is recommended.

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JONHON

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