

Panasonic

ideas for life

Slim type SSR for
1A and 2A control

AQ-G RELAYS



RoHS compliant

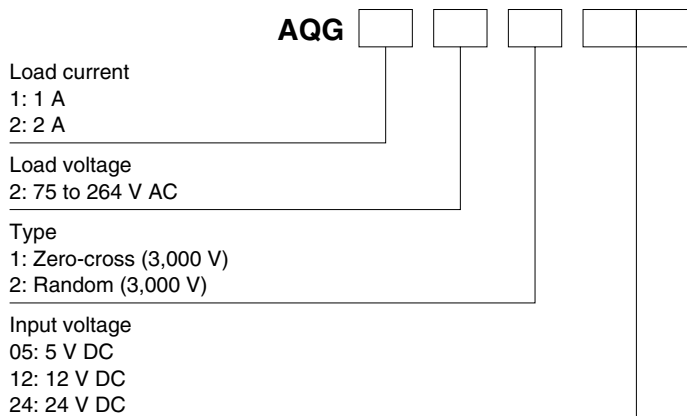
FEATURES

- Space saving, Vertical size with a maximum thickness of 4.5 mm.**
Mounting space has been reduced to 30% (compared to conventional SSR's) while meeting high density PC board mounting requirements.
- Snubber circuit preventing malfunction**
- Zero-cross type and Random type available**
- High dielectric strength of 3,000V AC**
(between input and output)
- Snubber circuit integrated**
The snubber circuit is integrated to prevent malfunction caused by the rapid rise of voltage on the output side, such as inductive load and current.

TYPICAL APPLICATIONS

- Household appliances such as air conditioners, refrigerators and humidifiers
- Healthcare and medical equipment
- Industrial machinery such as NC machines, mounters, injection molders, and robots
- Microcomputer boards
- Amusement and amenity related equipment

ORDERING INFORMATION



TYPES

| Type | Load current | Load voltage | Input voltage | Part No. |
|------------|--------------|----------------|---------------|----------|
| Zero-cross | 1A | 75 to 264 V AC | 5 V DC | AQG12105 |
| | | | 12 V DC | AQG12112 |
| | | | 24 V DC | AQG12124 |
| | 2A | 75 to 264 V AC | 5 V DC | AQG22105 |
| | | | 12 V DC | AQG22112 |
| | | | 24 V DC | AQG22124 |
| Random | 1A | 75 to 264 V AC | 5 V DC | AQG12205 |
| | | | 12 V DC | AQG12212 |
| | | | 24 V DC | AQG12224 |
| | 2A | 75 to 264 V AC | 5 V DC | AQG22205 |
| | | | 12 V DC | AQG22212 |
| | | | 24 V DC | AQG22224 |

Standard packing: Carton 20 pcs., Case 500 pcs.

RATING

1. Ratings (Ambient temperature: 20°C 68°F, Input voltage ripple: 1% or less)

1) Zero-cross type

| Item | Type | Part No. | | | | | | Remarks |
|------------|----------------------------------|----------------|------------------|-------------------|----------------|------------------|-------------------|---|
| | | AQG12105 | AQG12112 | AQG12124 | AQG22105 | AQG22112 | AQG22124 | |
| Input side | Input voltage | 4 to 6 V DC | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC | 4 to 6 V DC | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC | *1 |
| | Input impedance | Approx. 0.3k Ω | Approx. 0.8k Ω | Approx. 1.6k Ω | Approx. 0.3k Ω | Approx. 0.8k Ω | Approx. 1.6k Ω | |
| | Drop-out voltage, min. | 1 V | | | | | | |
| | Reverse voltage | 3 V | | | | | | |
| Load side | Max. load current | 1 A AC*2 | | | 2 A AC*2 | | | 1A: Ta = Max. 40°C 104°F 2A: Ta = Max. 25°C 77°F |
| | Load voltage | 75 to 264 V AC | | | | | | |
| | Frequency | 45 to 65 Hz | | | | | | |
| | Non-repetitive surge current | 8 A*3 | | | 30 A*3 | | | In one cycle at 60 Hz |
| | Max. "OFF-state" leakage current | 1.5 mA | | | | | | at 60 Hz at 200 V AC |
| | Max. "ON-state" voltage drop | 1.6 V | | | | | | at Max. carrying current |
| | Min. load current | 20 mA*4 | | | | | | |

2) Random type

| Item | Type | Part No. | | | | | | Remarks |
|------------|----------------------------------|----------------|------------------|-------------------|----------------|------------------|-------------------|---|
| | | AQG12205 | AQG12212 | AQG12224 | AQG22205 | AQG22212 | AQG22224 | |
| Input side | Input voltage | 4 to 6 V DC | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC | 4 to 6 V DC | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC | *1 |
| | Input impedance | Approx. 0.3k Ω | Approx. 0.8k Ω | Approx. 1.6k Ω | Approx. 0.3k Ω | Approx. 0.8k Ω | Approx. 1.6k Ω | |
| | Drop-out voltage, min. | 1 V | | | | | | |
| | Reverse voltage | 3 V | | | | | | |
| Load side | Max. load current | 1 A AC*2 | | | 2 A AC*2 | | | 1A: Ta = Max. 40°C 104°F 2A: Ta = Max. 25°C 77°F |
| | Load voltage | 75 to 264 V AC | | | | | | |
| | Frequency | 45 to 65 Hz | | | | | | |
| | Non-repetitive surge current | 8 A*3 | | | 30 A*3 | | | In one cycle at 60 Hz |
| | Max. "OFF-state" leakage current | 1.5 mA | | | | | | at 60 Hz at 200 V AC |
| | Max. "ON-state" voltage drop | 1.6 V | | | | | | at Max. carrying current |
| | Min. load current | 20 mA*4 | | | | | | |

Notes: *1. Refer to REFERENCE DATA "3. Input current vs. input voltage characteristics".

*2. Refer to REFERENCE DATA "1. Load current vs. ambient temperature".

*3. Refer to REFERENCE DATA "2. Non-repetitive surge current vs. carrying time".

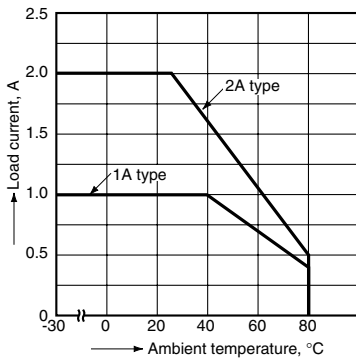
*4. When the load current is less than the rated minimum load current, please refer to "Cautions for Use of SSR".

2. Characteristics (Ambient temperature: 20°C 68°F, Input voltage ripple: 1% or less)

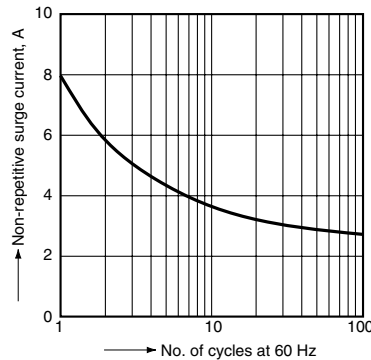
| Item | Zero-cross type | Random type | Remarks |
|-----------------------------|--|-------------------------------------|------------------------------------|
| Operate time max. | 1/2 cycle of voltage sine wave + 1 ms | 1 ms | |
| Release time, max. | 1/2 cycle of voltage sine wave + 1 ms | | |
| Insulation resistance, min. | 10 ⁹ Ω between input and output | | at 500 V DC |
| Breakdown voltage | 3,000 Vrms between input and output | | for 1 min. |
| Vibration resistance | 10 to 55 Hz double amplitude of 0.75 mm | | X, Y, Z axes |
| Shock resistance | Min. 1,000 m/s ² | | X, Y, Z axes |
| Ambient temperature | -30°C to +80°C -22°F to +176°F | | Non-condensing at low temperatures |
| Storage temperature | -30°C to +100°C -22°F to +212°F | | |
| Operational method | Zero-cross (Turn-ON and Turn-OFF) | Random turn ON, zero-cross turn OFF | |

REFERENCE DATA

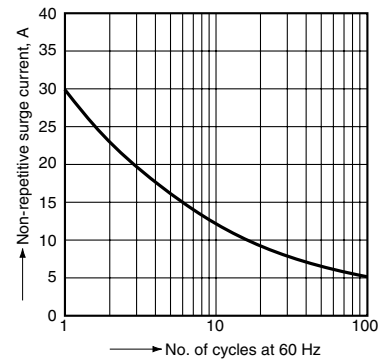
1. Load current vs. ambient temperature



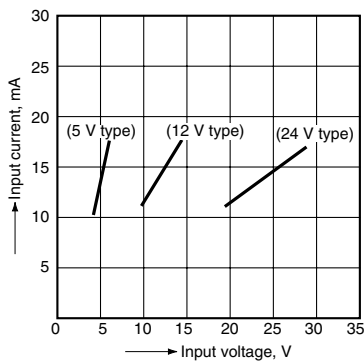
2.-(1) Non-repetitive surge current vs. carrying time (1A type)



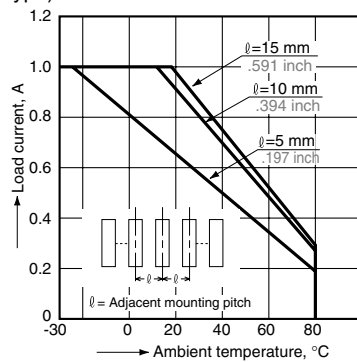
2.-(2) Non-repetitive surge current vs. carrying time (2A type)



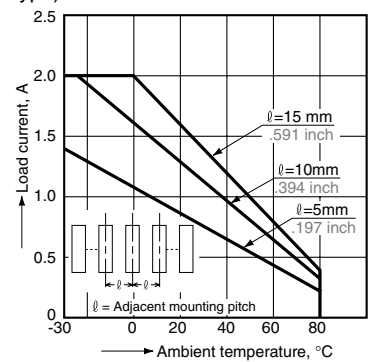
3. Input current vs. input voltage characteristics



4.-(1) Load current vs. ambient temperature characteristics for adjacent mounting (1A type)



4.-(2) Load current vs. ambient temperature characteristics for adjacent mounting (2A type)



DIMENSIONS (mm inch)

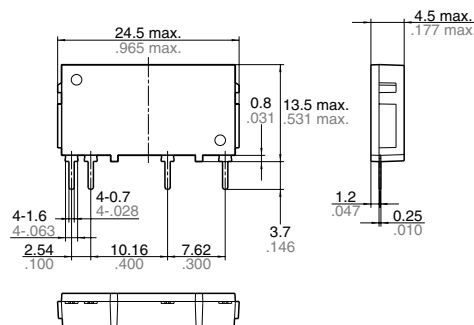
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

1. 1A type

CAD Data

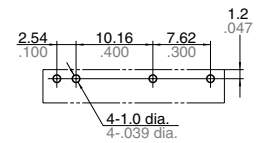


External dimensions



General tolerance: $\pm 0.2 \pm 0.008$

PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic

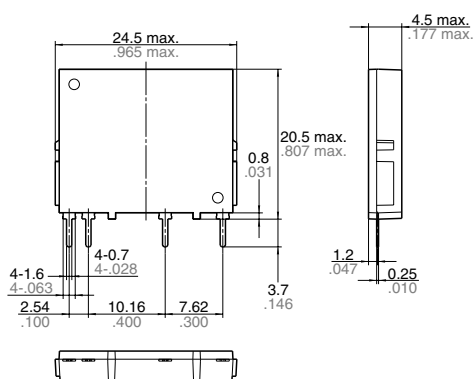


2. 2A type

CAD Data

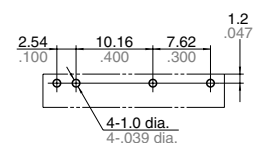


External dimensions



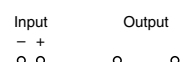
General tolerance: $\pm 0.2 \pm 0.008$

PC board pattern (Bottom view)

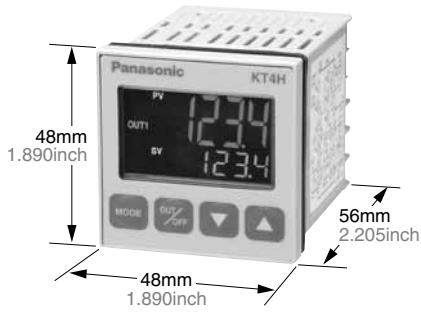


Tolerance: $\pm 0.1 \pm 0.004$

Schematic



Recommended Temperature Controllers



<KT4H Temperature Controller>

Our temperature controller is recommended for use with our Solid State Relays.

Features

- Space saving requiring only a depth of 65 mm
- Data collection possible through a PLC using RS485 communication
- Tool port is standard for easy data setting
- Inverted LCD + backlight for good legibility with large characters
- Excellent operability and rich optional control functions

Substitute part numbers

| Power supply | Control output | Part No. |
|-----------------|----------------------------|-------------|
| 100 to 240 V AC | Non-contact voltage output | AKT4H112100 |

* For detailed product information about temperature controllers, please refer to our website:
<http://industrial.panasonic.com/ac/e/>