



Discontinued as of August 31, 2011

(10A, 15A, 20A type)



(30A, 40A type)

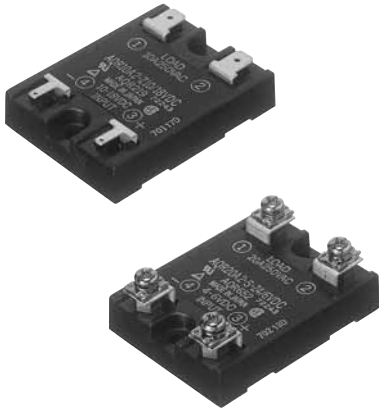


Panasonic

ideas for life

High capacity SSR,
both tab and screw
terminals available

AQ-R RELAYS



FEATURES

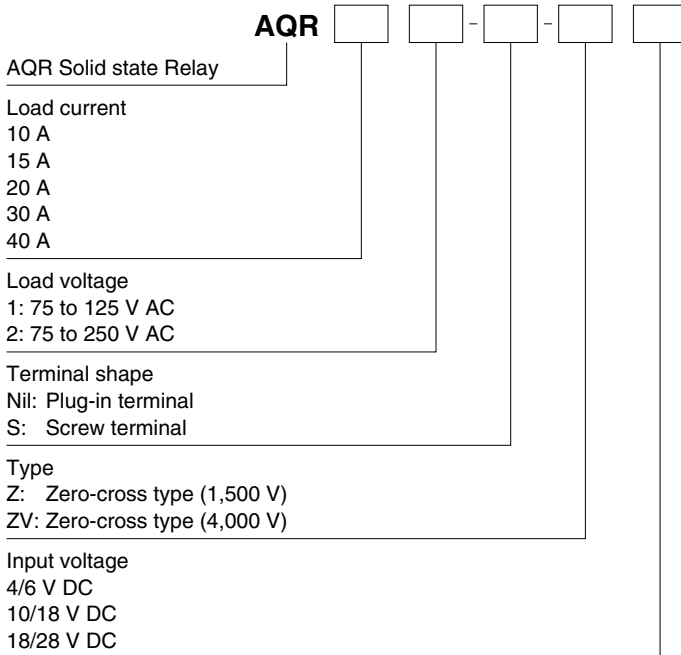
1. Two types of terminal shape: Plug-in terminal and Screw terminal (30 A, 40 A is screw terminal types only)
2. Flat type of SSR possible by aluminium printed circuit board
3. High dielectric strength of 1,500 V between input and output. 4,000 V available for 10A, 15A, 20A devices.
4. Heat sink and DIN mounting rail and terminal cover are available as accessories

APPLICATIONS

1. Molding machine (heater control)
2. Temperature controlled bath (heater control)
3. Printing machine (heater control)
4. Machine tool (motor control)

Compliance with RoHS Directive

ORDERING INFORMATION





TYPES

1. Tab terminal type

| Type | Load current | Load voltage | Input voltage | Standard (1,500V AC) | Reinforced (4,000V AC) |
|------------|--------------|----------------|---------------|----------------------|------------------------|
| | | | | Part No. | Part No. |
| Zero-cross | 10 A | 75 to 125V AC | 4 to 6V DC | AQR10A1-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR10A1-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR10A1-Z18/28VDC | — |
| | | 75 to 250V AC | 4 to 6V DC | AQR10A2-Z4/6VDC | AQR10A2-ZV4/6VDC |
| | | | 10 to 18V DC | AQR10A2-Z10/18VDC | AQR10A2-ZV10/18VDC |
| | | | 18 to 28V DC | AQR10A2-Z18/28VDC | AQR10A2-ZV18/28VDC |
| | 15 A | 75 to 125 V AC | 4 to 6V DC | AQR15A1-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR15A1-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR15A1-Z18/28VDC | — |
| | | 75 to 250 V AC | 4 to 6V DC | AQR15A2-Z4/6VDC | AQR15A2-ZV4/6VDC |
| | | | 10 to 18V DC | AQR15A2-Z10/18VDC | AQR15A2-ZV10/18VDC |
| | | | 18 to 28V DC | AQR15A2-Z18/28VDC | AQR15A2-ZV18/28VDC |
| | 20 A | 75 to 125 V AC | 4 to 6V DC | AQR20A1-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR20A1-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR20A1-Z18/28VDC | — |
| | | 75 to 250 V AC | 4 to 6V DC | AQR20A2-Z4/6VDC | AQR20A2-ZV4/6VDC |
| | | | 10 to 18V DC | AQR20A2-Z10/18VDC | AQR20A2-ZV10/18VDC |
| | | | 18 to 28V DC | AQR20A2-Z18/28VDC | AQR20A2-ZV18/28VDC |

Standard packing: Carton 10 pcs., Case: 100 pcs.

2. Screw-terminal type

| Type | Load current | Load voltage | Input voltage | Standard (1,500V AC) | Reinforced (4,000V AC) |
|------------|--------------|----------------|---------------|----------------------|------------------------|
| | | | | Part No. | Part No. |
| Zero-cross | 10 A | 75 to 125 V AC | 4 to 6V DC | AQR10A1-S-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR10A1-S-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR10A1-S-Z18/28VDC | — |
| | | 75 to 250 V AC | 4 to 6V DC | AQR10A2-S-Z4/6VDC | AQR10A2-S-ZV4/6VDC |
| | | | 10 to 18V DC | AQR10A2-S-Z10/18VDC | AQR10A2-S-ZV10/18VDC |
| | | | 18 to 28V DC | AQR10A2-S-Z18/28VDC | AQR10A2-S-ZV18/28VDC |
| | 15 A | 75 to 125 V AC | 4 to 6V DC | AQR15A1-S-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR15A1-S-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR15A1-S-Z18/28VDC | — |
| | | 75 to 250 V AC | 4 to 6V DC | AQR15A2-S-Z4/6VDC | AQR15A2-S-ZV4/6VDC |
| | | | 10 to 18V DC | AQR15A2-S-Z10/18VDC | AQR15A2-S-ZV10/18VDC |
| | | | 18 to 28V DC | AQR15A2-S-Z18/28VDC | AQR15A2-S-ZV18/28VDC |
| | 20 A | 75 to 125 V AC | 4 to 6V DC | AQR20A1-S-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR20A1-S-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR20A1-S-Z18/28VDC | — |
| | | 75 to 250 V AC | 4 to 6V DC | AQR20A2-S-Z4/6VDC | AQR20A2-S-ZV4/6VDC |
| | | | 10 to 18V DC | AQR20A2-S-Z10/18VDC | AQR20A2-S-ZV10/18VDC |
| | | | 18 to 28V DC | AQR20A2-S-Z18/28VDC | AQR20A2-S-ZV18/28VDC |
| | 30 A | 75 to 250 V AC | 4 to 6V DC | AQR30A2-S-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR30A2-S-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR30A2-S-Z18/28VDC | — |
| | 40 A | 75 to 250 V AC | 4 to 6V DC | AQR40A2-S-Z4/6VDC | — |
| | | | 10 to 18V DC | AQR40A2-S-Z10/18VDC | — |
| | | | 18 to 28V DC | AQR40A2-S-Z18/28VDC | — |

Standard packing: Carton 10 pcs., Case: 100 pcs.

**SPECIFICATIONS****1. Ratings (at 20°C 68°F, Input ripple: 1% or less)****1) 10 A type**

| Part No. | | AQR10A1-Z4/ 6VDC AQR10A1-S-Z4/ 6VDC | AQR10A1-Z10/ 18VDC AQR10A1-S-Z10/ 18VDC | AQR10A1-Z18/ 28VDC AQR10A1-S-Z18/ 28VDC | AQR10A2-Z4/ 6VDC AQR10A2-S-Z4/ 6VDC AQR10A2-S-ZV4/ 6VDC | AQR10A2-Z10/ 18VDC AQR10A2-S-Z10/ 18VDC AQR10A2-S- ZV10/18VDC | AQR10A2-Z18/ 28VDC AQR10A2-S-Z18/ 28VDC AQR10A2-S- ZV18/28VDC | Remarks |
|-----------|----------------------------------|----------------------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------|
| Items | Input voltage | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | |
| | Input impedance | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | *1 |
| | Drop-out voltage, min. | 1 V | | | | | | |
| Load side | Max. load current | 10 A*2 | | | | | | Ta = Max. 40°C 104°F |
| | Load voltage | 75 to 125 V AC | | | 75 to 250 V AC | | | |
| | Frequency | 45 to 65 Hz | | | | | | |
| | Repetitive peak voltage | 400 V | | | 600 V | | | |
| | Non-repetitive surge current | 100 A*3 | | | | | | In one cycle at 60 Hz |
| | Max. "OFF-state" leakage current | 2.5 mA (when 100 V AC applied) | | | 5 mA (when 200 V AC applied) | | | at 60 Hz |
| | Max. "ON-state" voltage drop | 1.6 V | | | | | | at max. carrying current |
| | Min. load current | 100 mA*4 | | | | | | |
| | OFF-state dV/dt | 100 V/μs | | | | | | |

2) 15 A type

| Part No. | | AQR15A1-Z4/ 6VDC AQR15A1-S-Z4/ 6VDC | AQR15A1-Z10/ 18VDC AQR15A1-S-Z10/ 18VDC | AQR15A1-Z18/ 28VDC AQR15A1-S-Z18/ 28VDC | AQR15A2-Z4/ 6VDC AQR15A2-S-Z4/ 6VDC AQR15A2-S-ZV4/ 6VDC | AQR15A2-Z10/ 18VDC AQR15A2-S-Z10/ 18VDC AQR15A2-S- ZV10/18VDC | AQR15A2-Z18/ 28VDC AQR15A2-S-Z18/ 28VDC AQR15A2-S- ZV18/28VDC | Remarks |
|-----------|----------------------------------|----------------------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------|
| Items | Input voltage | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | |
| | Input impedance | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | *1 |
| | Drop-out voltage, min. | 1 V | | | | | | |
| Load side | Max. load current | 15 A*2 | | | | | | Ta = Max. 40°C 104°F |
| | Load voltage | 75 to 125 V AC | | | 75 to 250 V AC | | | |
| | Frequency | 45 to 65 Hz | | | | | | |
| | Repetitive peak voltage | 400 V | | | 600 V | | | |
| | Non-repetitive surge current | 150 A*3 | | | | | | In one cycle at 60 Hz |
| | Max. "OFF-state" leakage current | 2.5 mA (when 100 V AC applied) | | | 5 mA (when 200 V AC applied) | | | at 60 Hz |
| | Max. "ON-state" voltage drop | 1.6 V | | | | | | at max. carrying current |
| | Min. load current | 100 mA*4 | | | | | | |
| | OFF-state dV/dt | 100 V/μs | | | | | | |

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

*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".



3) 20 A type

| Part No. | | AQR20A1-Z4/ 6VDC AQR20A1-S-Z4/ 6VDC | AQR20A1-Z10/ 18VDC AQR20A1-S-Z10/ 18VDC | AQR20A1-Z18/ 28VDC AQR20A1-S-Z18/ 28VDC | AQR20A2-Z4/ 6VDC AQR20A2-ZV4/ 6VDC AQR20A2-S-ZV4/ 6VDC | AQR20A2-Z10/ 18VDC AQR20A2-ZV10/ 18VDC AQR20A2-S-Z10/ 18VDC AQR20A2-S- ZV10/18VDC | AQR20A2-Z18/ 28VDC AQR20A2-ZV18/ 28VDC AQR20A2-S-Z18/ 28VDC AQR20A2-S- ZV18/28VDC | Remarks | |
|-----------|----------------------------------|----------------------------------------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------|-----------------------------|
| Items | Input voltage | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | | |
| | Input impedance | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | *1 | |
| | Drop-out voltage, min. | 1 V | | | | | | | |
| Load side | Max. load current | 20 A*2 | | | | | | | Ta = Max. 40°C 104°F |
| | Load voltage | 75 to 125 V AC | | | 75 to 250 V AC | | | | |
| | Frequency | 45 to 65 Hz | | | | | | | |
| | Repetitive peak voltage | 400 V | | | 600 V | | | | |
| | Non-repetitive surge current | 200 A*3 | | | | | | | In one cycle at 60 Hz |
| | Max. "OFF-state" leakage current | 2.5 mA (when 100 V AC applied) | | | 5 mA (when 200 V AC applied) | | | | at 60 Hz |
| | Max. "ON-state" voltage drop | 1.6 V | | | | | | | at max. carrying current |
| | Min. load current | 100 mA*4 | | | | | | | |
| | OFF-state dV/dt | 100 V/μs | | | | | | | |

4) 30 A type and 40 A type

| Part No. | | AQR30A2-S-Z4/ 6VDC | AQR30A2-S-Z10/ 18VDC | AQR30A2-S-Z18/ 28VDC | AQR40A2-S-Z4/ 6VDC | AQR40A2-S-Z10/ 18VDC | AQR40A2-S-Z18/ 28VDC | Remarks | |
|-----------|----------------------------------|------------------------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|---------|-----------------------------|
| Items | Input voltage | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | 4 to 6V DC | 10 to 18V DC | 18 to 28V DC | | |
| | Input impedance | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | Approx. 0.26 kΩ | Approx. 0.86 kΩ | Approx. 1.36 kΩ | *1 | |
| | Drop-out voltage, min. | 1 V | | | | | | | |
| Load side | Max. load current | 30 A*2 | | | 40 A*2 | | | | Ta = Max. 40°C 104°F |
| | Load voltage | 75 to 250 V AC | | | | | | | |
| | Frequency | 45 to 65 Hz | | | | | | | |
| | Non-repetitive surge current | 300 A*3 | | | 400 A*3 | | | | In one cycle at 60 Hz |
| | Max. "OFF-state" leakage current | 5 mA (when 200 V AC applied) | | | | | | | at 60 Hz |
| | Max. "ON-state" voltage drop | 1.6 V | | | | | | | at max. carrying current |
| | Min. load current | 120 mA*4 | | | | | | | |

- Notes: *1. Refer to REFERENCE DATA "3. Input current vs. input voltage".
 *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 (at 20°C 68°F, Input ripple: 1% or less)

| Item | Type | Zero-cross type | | Remarks |
|--------------------------------------|-------------|-------------------------------------------|-------------------------------------------|------------------------------|
| | | Standard type | Reinforced type | |
| Operate time, max. | | 1/2 cycle of voltage sine wave + 1 ms | | |
| Release time, max. | | 1/2 cycle of voltage sine wave + 1 ms | | |
| Insulation resistance, min., Initial | | 100 M Ω between input, output and case | | at 500V DC |
| Breakdown voltage | | 1,500 V AC between input, output and case | 4,000 V AC between input, output and case | For 1 min. |
| Vibration resistance | Functional | 10 to 55 Hz at double amplitude of 2 mm* | | 1 hour for X, Y, Z axes |
| | Destructive | 10 to 55 Hz at double amplitude of 2 mm* | | 10 minutes for X, Y, Z axes |
| Shock resistance | Functional | Min. 980 m/s ² {100 G} | | 5 time each for X, Y, Z axes |
| | Destructive | Min. 980 m/s ² {100 G} | | 4 time each for X, Y, Z axes |
| Ambient temperature | | -20°C to +80°C -4°F to +176°F | | |
| Storage temperature | | -25°C to +85°C -13°F to +185°F | | |
| Operational method | | Zero-cross (Turn-ON and Turn-OFF) | | |

Note: *30A and 40A type is 10 to 55 Hz at double amplitude of 1.5 mm .059 inch.



REFERENCE DATA

1. Load current vs. ambient temperature

Use load current within range specified in the figure below.

Tested condition:

With external heat sink

1) (1) 10 A, 15A, 20 A type

- A heat sink; optional heat sink (AQP-HS-J10A) or a 150×150×3.2 mm aluminum sheet (painted black)

(2) 30 A, 40 A type

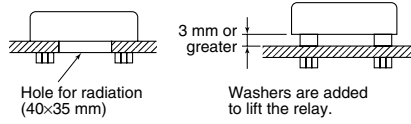
Shown with standard heat sink (AQP-HS-30/40A)

2) If attached to a heat sink, use a heat-conductive compound or similar coating to improve cooling.

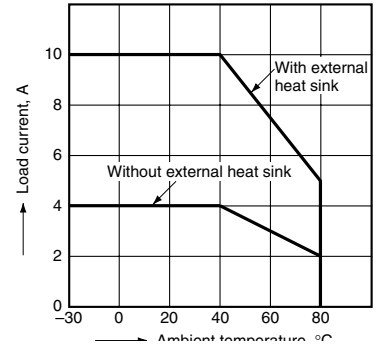
Without external heat sink

If the mounting surface is not metallic and a heat sink is not used, expose the bottom surface and plate surface to improve heat dissipation.

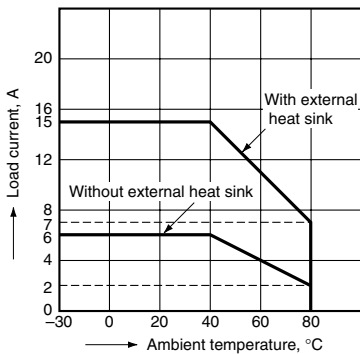
The graphs show the characteristics when the relay is mounted as shown in the right figure.



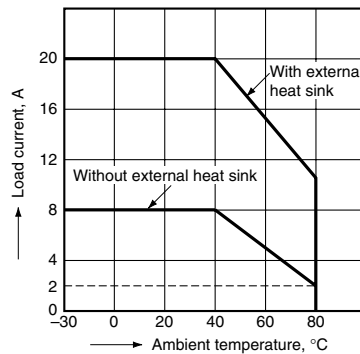
(1) 10 A type



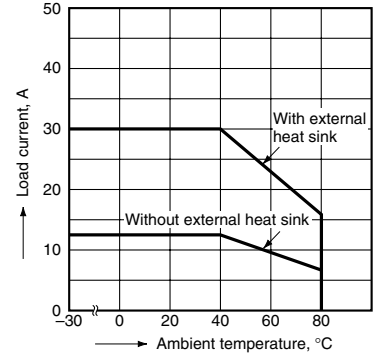
(2) 15 A type



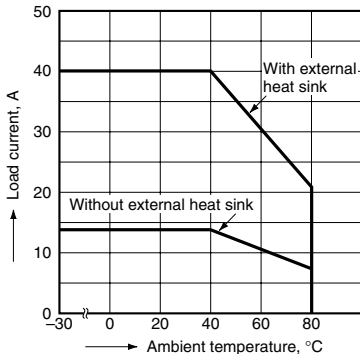
(3) 20 A type



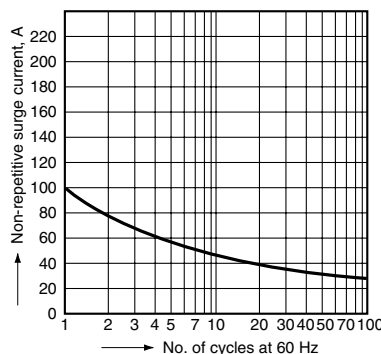
(4) 30 A type



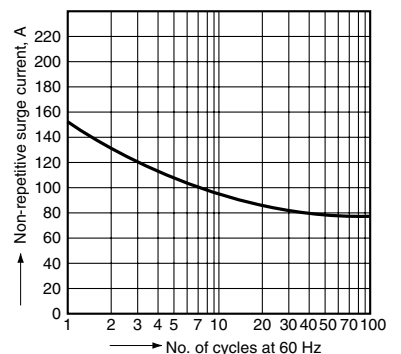
(5) 40 A type



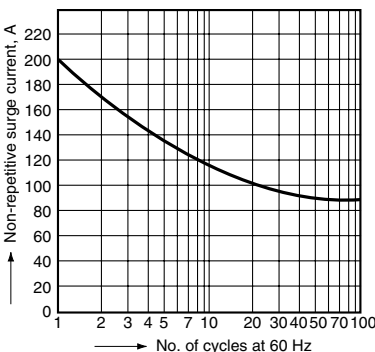
2-1. Non-repetitive surge current vs. carrying time (10 A type)



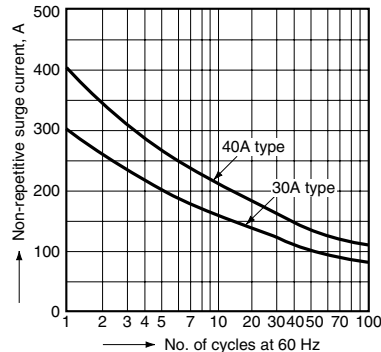
2-2. Non-repetitive surge current vs. carrying time (15 A type)



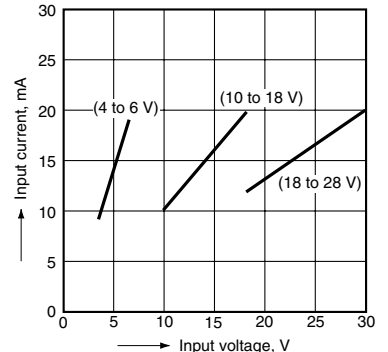
2-3. Non-repetitive surge current vs. carrying time (20 A type)



2-4. Non-repetitive surge current vs. carrying time (30 A, 40 A type)



3. Input current vs. input voltage (10 A, 15 A, 20 A, 30 A, 40 A common)





Partly Order Discontinued as of August 31, 2011

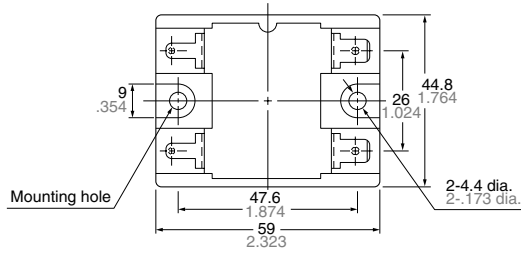
AQ-R

DIMENSIONS (mm inch)

The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://panasonic-electric-works.net/ac>

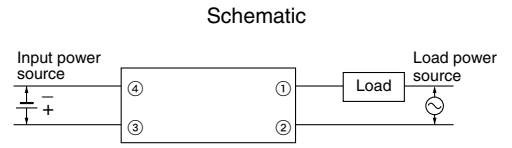
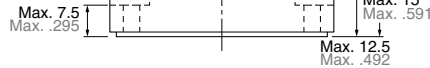
1. Tab terminal

CAD Data

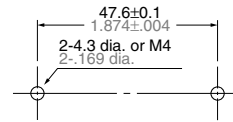


Conform to AMP plug-in terminal #110 series receptacle

Conform to AMP plug-in terminal #250 series receptacle

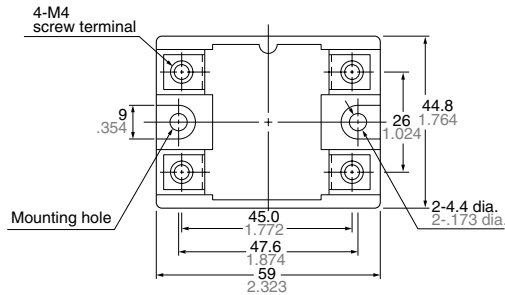


Mounting dimensions (Bottom view)

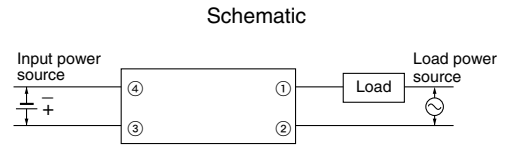
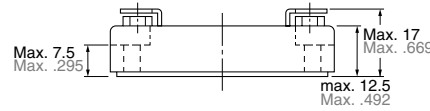


2. Screw terminal

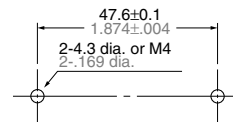
CAD Data



Mounting hole



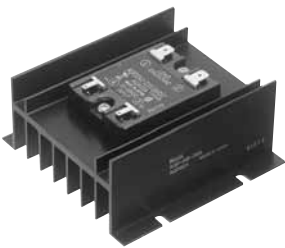
Mounting dimensions (Bottom view)



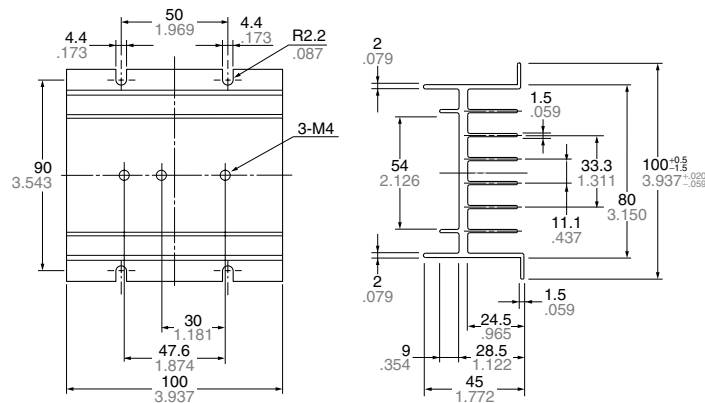
ACCESSORIES

Heat sink (For 10 A, 15A and 20 A)

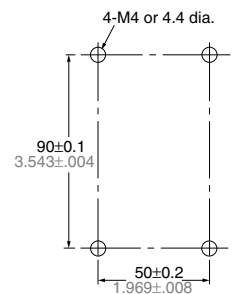
CAD Data



AQP-HS-J10A



Mounting dimensions (Bottom view)



General tolerance: ±0.5 ±0.20



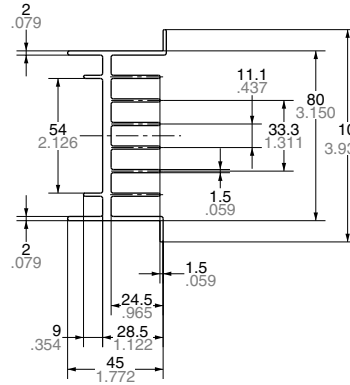
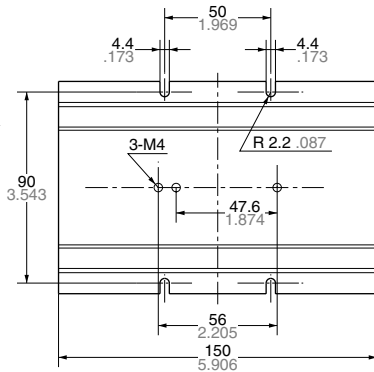
Partly Order Discontinued as of August 31, 2011

Heat sink (For 30 A, 40 A)

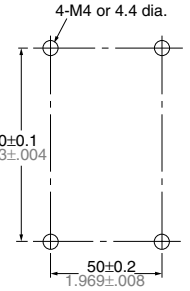
CAD Data



AQP-HS-30/40A



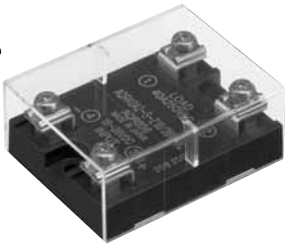
Mounting dimensions (Bottom view)



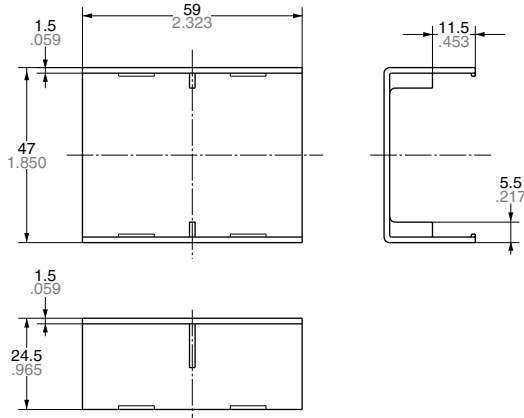
General tolerance: ±0.5 ±.020

With terminal cover

CAD Data



AQP-PC



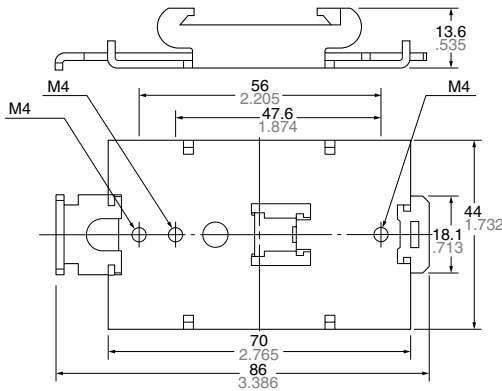
General tolerance: ±0.5 ±.020

DIN rail mounting plate

CAD Data

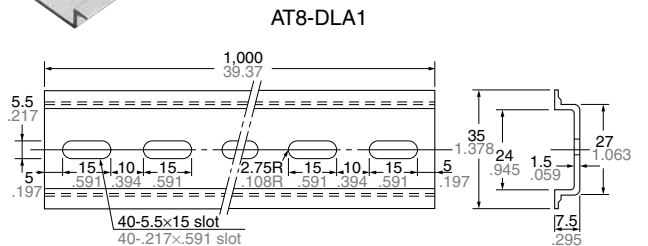


AQP-DP



Mounting rail

CAD Data



General tolerance: ±0.5 ±.020

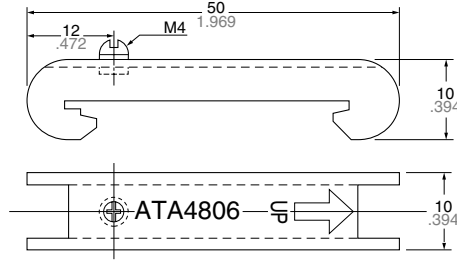
AQ-R

Fastening plate

CAD Data



ATA4806



Recommended Temperature Controllers

<KT4H Temperature Controller>

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

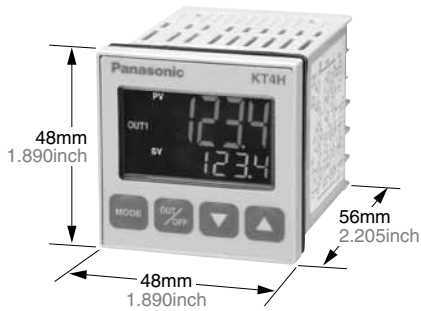
Features

- Data can be collected using the RS485 communications interface via a PLC.
- Improved visibility using a negative type LCD and backlight.
- Depth-wise length (chassis dimension) is 56 mm 2.205 inch.

Substitute part numbers

| Power supply | Control output | Part No. |
|-----------------|----------------|-------------|
| 100 to 240 V AC | Relay contact | AKT4H111100 |

*For detailed product information about temperature controllers, please refer to our website:
http://panasonic-denko.co.jp/ac/e/fasys/component/temperature_controller/



For Cautions for Use.