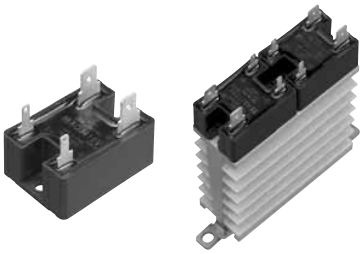
UL (60950-1) reinforced insulation compliant

Panasonic
ideas for life

Load current 10 to 40A
Small Tab Terminal SSR

AQ-J RELAYS



Slim heat sink combined type

FEATURES

1. Compact Size
W 28 × L 38 × H 30 mm
W 1.102 × L 1.496 × H 1.181 inch
2. Built-in varistor
3. Reverse input connection prevention function
4. Labor Saving (tab terminal)
5. Heat sink combined types ready to mount on DIN rail added (Radiating grease and screws assembly process not needed)
6. Output arrangement 1a and 1a × 2 available in the heat sink combined type

Note: * International standards are acquired for AQ-J SSR stand-alone, not applied to heat sink combined type.

TYPICAL APPLICATIONS

1. Kitchen appliances
2. Vending machine
3. Injection molding machine
4. Packing machine
5. Amusement machine

Compliance with RoHS Directive

ORDERING INFORMATION

AQJ □ □ □ □ □

Output type
1: 10A, 75V to 264V AC
2: 15A, 75V to 264V AC
4: 25A, 75V to 264V AC

Terminal, Type
1: Tab terminal, Zero-cross
2: Tab terminal, Random*

Input voltage
2: 4 to 6 V DC
6: 18 to 28 V DC
9: 10 to 18 V DC

Functions
V: Built-in varistor

Slim heat sink combined type
None: Without a heat sink
Y: 1a type
W: 1a × 2 type

Note: * Random type is available by custom order.

TYPES

1. AQ-J Solid State Relays

Type	Load current	Load voltage	Input voltage	Part No.
Zero-cross*	10A	75V to 264V AC	4 to 6V DC	AQJ112V
			10 to 18V DC	AQJ119V
			18 to 28V DC	AQJ116V
	15A		4 to 6V DC	AQJ212V
			10 to 18V DC	AQJ219V
			18 to 28V DC	AQJ216V
	25A		4 to 6V DC	AQJ412V
			10 to 18V DC	AQJ419V
			18 to 28V DC	AQJ416V

Standard Packing; carton: 10 pcs., case: 200 pcs.
Note: * Random type also available. Please inquire.

2. AQ-J Slim Heat Sink Combined Type

Output configuration	Type	Load current	Load voltage	Input voltage	Part No.
1a	Zero-cross*	10A	75V to 264V AC	4 to 6V DC	AQJ112VY
				10 to 18V DC	AQJ119VY
				18 to 28V DC	AQJ116VY
		20A		4 to 6V DC	AQJ412VY
				10 to 18V DC	AQJ419VY
				18 to 28V DC	AQJ416VY
1a × 2		10A (per 1a)		4 to 6V DC	AQJ112VW
				10 to 18V DC	AQJ119VW
				18 to 28V DC	AQJ116VW
		15A (per 1a)		4 to 6V DC	AQJ412VW
				10 to 18V DC	AQJ419VW
				18 to 28V DC	AQJ416VW

Standard Packing; no carton, case: 10 pcs.
Note: * Random type also available. Please inquire.

3. Accessories

Type	Part No.	Packaged quantity
Slim heat sink (28mm wide) (Mountable on a DIN rail)	AQP-HS-SJ10A	No carton, 10 in a case
Slim heat sink (45mm wide) (Mountable on a DIN rail)	AQP-HS-SJ20A	No carton, 8 in a case
Standard heat sink (10A and 15A)	AQP-HS-J10A	5 in a carton, 20 in a case
Standard heat sink (25A only)	AQP-HS-J25A	No carton, 5 in a case
DIN rail mounting plate	AQP-DPJ	5 in a bag, 50 in a case

RATING

1. Ratings (Test sample: AQ-J stand-alone, Measurement condition: at 20°C 68°F, input ripple: 1% or less)

1) Input side

Item \ Part No.	AQJ112V AQJ212V AQJ412V	AQJ119V AQJ219V AQJ419V	AQJ116V AQJ216V AQJ416V
Rated voltage	5V DC	12V DC	24V DC
Input voltage	4 to 6V DC	10 to 18V DC	18 to 28V DC
Input impedance	Approx. 0.26kΩ	Approx. 0.8kΩ	Approx. 1.6kΩ
Drop-out voltage	Min. 1V DC		

Note: Refer to REFERENCE DATA “3. Input current vs. input voltage characteristics”.

2) Output side

Item \ Part No.	AQJ112V AQJ119V AQJ116V	AQJ212V AQJ219V AQJ216V	AQJ412V AQJ419V AQJ416V
Max. load current*1	10A	15A	25A
Load voltage	75 to 264V AC		
Frequency	45Hz to 65Hz		
Non-repetitive surge current	100A	150A	250A
“OFF-state” leakage current	Max. 5mA		
“ON-state” voltage drop	Max. 1.6V		
Min. load current*2	50mA		

Notes: *1. Refer to REFERENCE DATA “1. Load current vs. ambient temperature”.
*2. When the load current is less than the rated minimum load current, please refer to “Cautions for Use”.

2. Ratings (Test sample: AQ-J slim heat sink combined type, Measurement condition: at 20°C 68°F, input ripple: 1 % or less)

1) Input side

Item \ Part No.	AQJ112V(Y·W) AQJ412V(Y·W)	AQJ119V(Y·W) AQJ419V(Y·W)	AQJ116V(Y·W) AQJ416V(Y·W)
Rated voltage	5V DC	12V DC	24V DC
Input voltage	4 to 6V DC	10 to 18V DC	18 to 28V DC
Input impedance	Approx. 0.26kΩ	Approx. 0.8kΩ	Approx. 1.6kΩ
Drop-out voltage	Min. 1V DC		

Note: Refer to REFERENCE DATA “3. Input current vs. input voltage characteristics”.

2) Output side

Item \ Part No.	AQJ112VY AQJ119VY AQJ116VY	AQJ412VY AQJ419VY AQJ416VY	AQJ112VW AQJ119VW AQJ116VW	AQJ412VW AQJ419VW AQJ416VW
Output arrangement	1a		1a × 2	
Max. load current*1	10A	20A	10A	15A
Load voltage	75 to 264V AC			
Frequency	45Hz to 65Hz			
Non-repetitive surge current*2	100A	250A	100A	250A
"OFF-state" leakage current	Max. 5mA			
"ON-state" voltage drop	Max. 1.6V			
Min. load current*3	50mA			

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

3. Characteristics (Measurement condition: at 20°C 68°F, input ripple: 1% or less)

Item	Characteristics	Remarks
Operate time	Max. 1/2 cycle of voltage sine wave + 1ms	
Release time	Max. 1/2 cycle of voltage sine wave + 1ms	
Insulation resistance	Min. 100MΩ between input, output and case	at 500 V DC
Breakdown voltage	3,000 Vrms between input and output	for 1min.
	2,500 Vrms between input, output and case	
Vibration resistance	SSR stand-alone: 10 to 55Hz, double amplitude of 1.5mm Slim heat sink combined type: 10 to 55Hz, double amplitude of 0.75mm	X, Y, Z axes
Shock resistance	SSR stand-alone: Min. 980m/s² Slim heat sink combined type: Min. 197m/s²	X, Y, Z axes
Ambient temperature	–30 to +80°C –22 to +176°F	Non-condensing at low temperatures
Storage temperature	–30 to +100°C –22 to +212°F	
Operational method	Zero-cross (Turn ON and Turn OFF)	

REFERENCE DATA

(1) AQ-J Solid State Relays

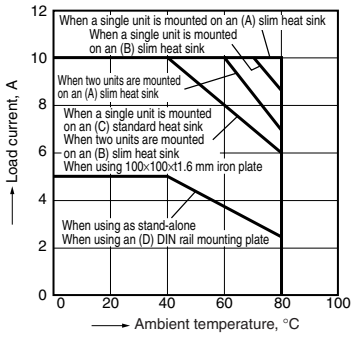
1. Load current vs. ambient temperature

Use load current within range specified in the figure below

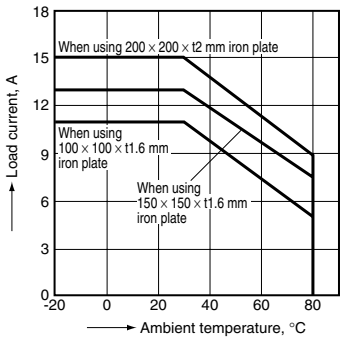
Tested condition:
1) If attached to a heat sink, use a heat conductive compound of similar coating to improve cooling
2) Without external heat sink
If the mounting surface is not metallic and a heat sink is not used, expose the bottom surface and plate surface to improve heat dissipation.
3) The current value is per 1a.

(A) slim heat sink	AQP-HS-SJ20A
(B) slim heat sink	AQP-HS-SJ10A
(C) standard heat sink	AQP-HS-J10A
(D) DIN rail mounting plate	AQP-DPJ
(E) standard heat sink	AQP-HS-J25A

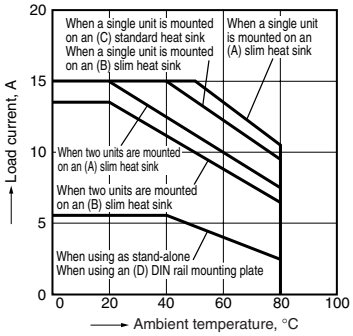
(1) 10 A type (when using heat sink or iron plate)



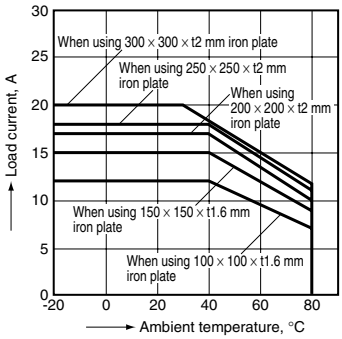
(2)-1. 15 A type (when using iron plate)



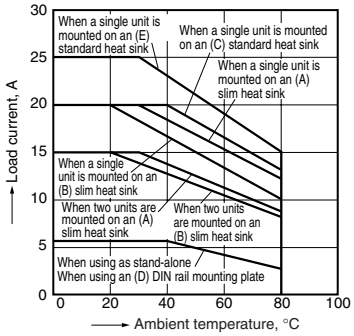
(2)-2. 15 A type (when using a heat sink)



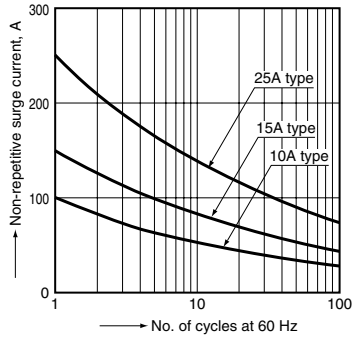
(3)-1. 25 A type (when using iron plate)



(3)-2. 25 A type (when using a heat sink)

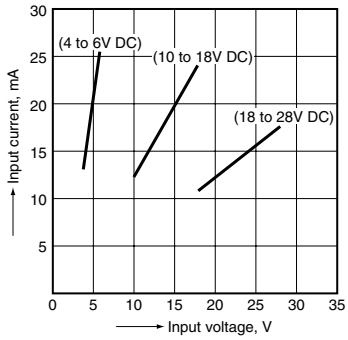


2. Non-repetitive surge current vs. carrying time



3. Input current vs. input voltage characteristics

(10A, 15A and 25A common)

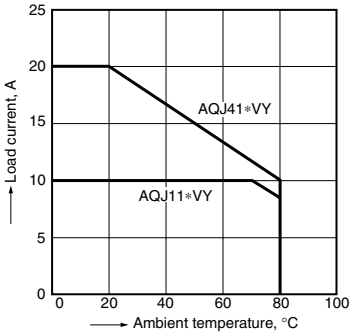


(2) AQ-J Slim Heat Sink Combined Type

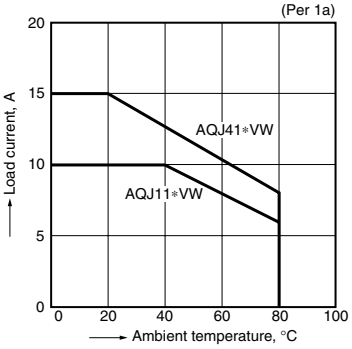
1. Load current vs. ambient temperature characteristics

Use load current within range specified in the figure below

(1) Output arrangement: 1a

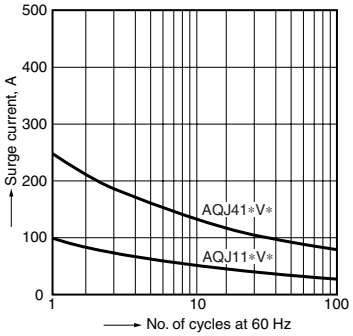


(2) Output arrangement: 1a × 2

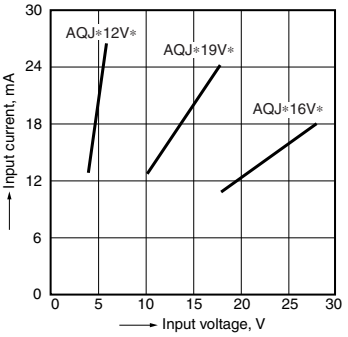


Note:
When two contacts are operated simultaneously.
In the case of a single-contact operation, the rating of (1) AQJ11∗VY, AQJ41∗VY applies.

2. Surge current vs. carrying time characteristics



3. Input current vs. input voltage characteristics



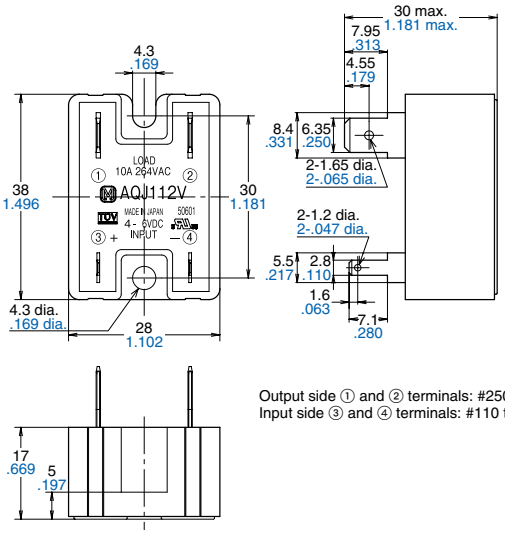
DIMENSIONS (mm inch)

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

1. AQ-J Stand Alone

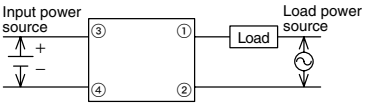
CAD Data

External dimensions

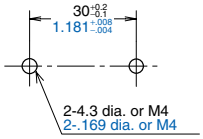


Output side ① and ② terminals: #250 type, t = 0.8 .031
Input side ③ and ④ terminals: #110 type, t = 0.5 .020

Schematic



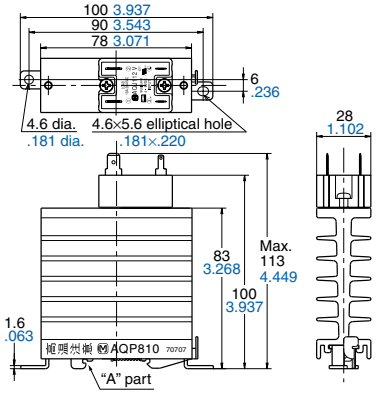
Mounting dimensions



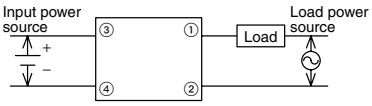
2.-(1) AQ-J Slim Heat Sink Combined Type
Output Arrangement: 1a

CAD Data

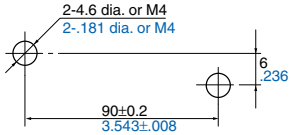
External dimensions



Schematic



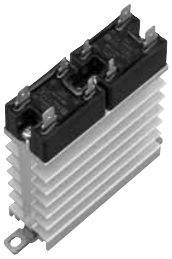
Mounting dimensions (Top view)



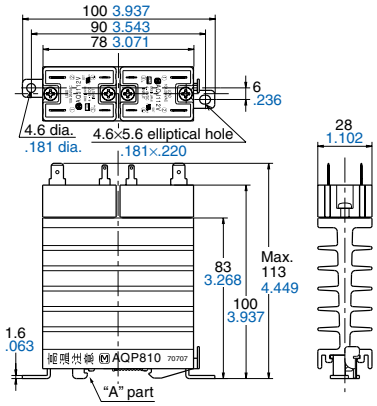
Note: When using on a DIN rail, please install so that the "A" part is on top.

2.-(2) AQ-J Slim Heat Sink Combined Type
Output Arrangement: 1a × 2

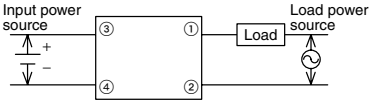
CAD Data



External dimensions

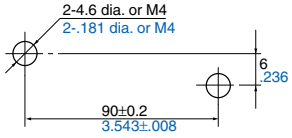


Schematic



Note: Use caution for AQ-J terminal numbers.

Mounting dimensions (Top view)



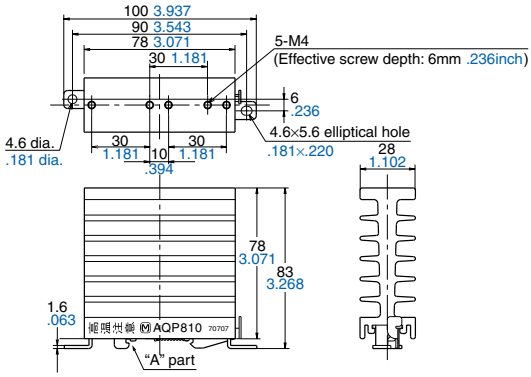
Note: When using on a DIN rail, please install so that the "A" part is on top.

ACCESSORIES (mm inch)

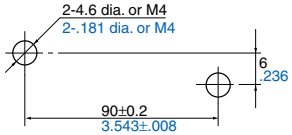
AQP-HS-SJ10A Slim Heat Sink

CAD Data

External dimensions



Mounting dimensions (Top view)

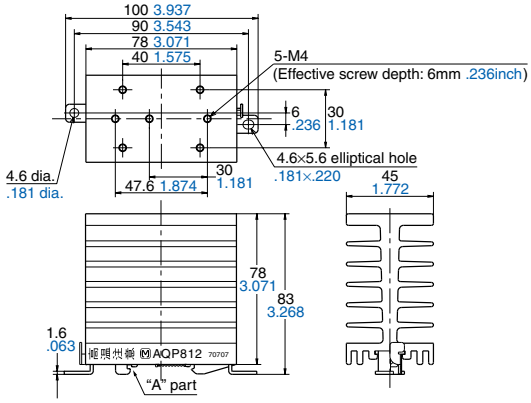


Note: When using on a DIN rail, please install so that the "A" part is on top.

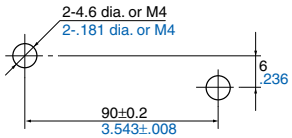
AQP-HS-SJ20A Slim Heat Sink

CAD Data

External dimensions



Mounting dimensions (Top view)

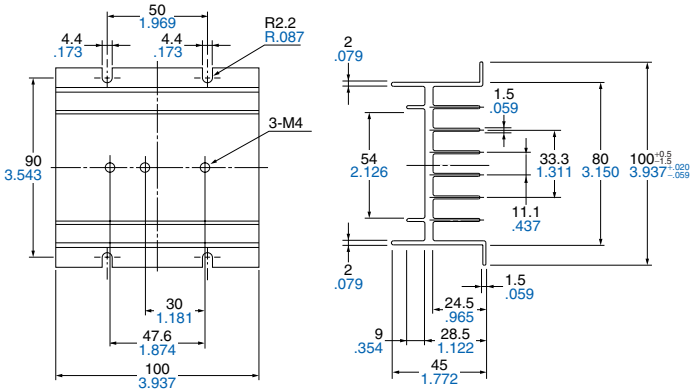


Note: When using on a DIN rail, please install so that the "A" part is on top.

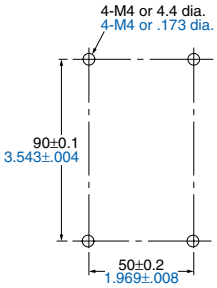
AQP-HS-J10A Standard Heat Sink (for 10A and 15A types)

CAD Data

External dimensions



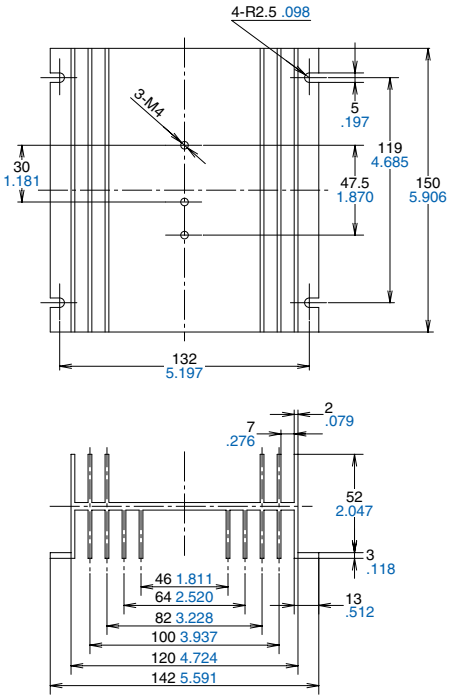
Mounting dimensions



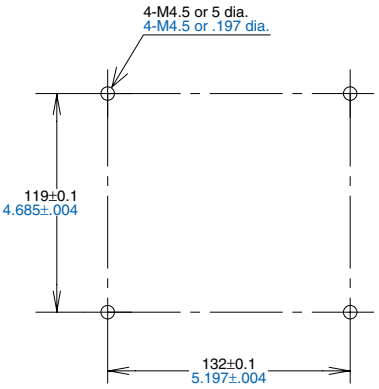
AQP-HS-J25A Standard Heat Sink (for 25A type)

CAD Data

External dimensions



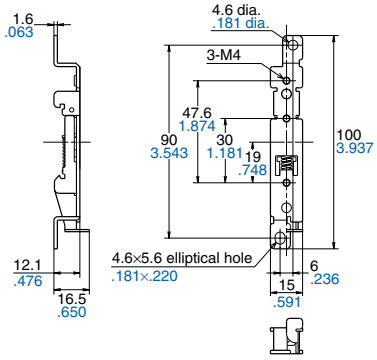
Mounting dimensions



AQP-DPJ DIN Rail Mounting Plate

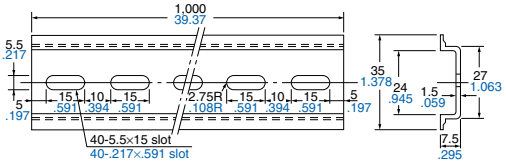
CAD Data

External dimensions



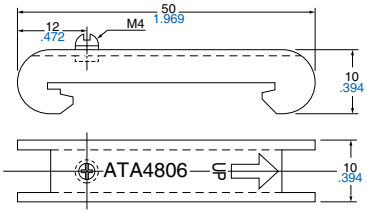
AT8-DLA1 Mounting rail

CAD Data



ATA4806 Fastening plate

CAD Data



NOTES

1. Part number indication

The AQ-J slim heat sink combined type is a product combining the AQ-J SSR and AQ-J SSR heat sinks. The part numbers are indicated on each AQ-J SSR and heat sink.

Ex) In the case of AQJ112VY

Part number of AQ-J SSR: AQJ112V

Part number of the heat sink: AQP810*

When using these parts, please refer to REFERENCE DATA, "1. Load current vs. ambient temperature".

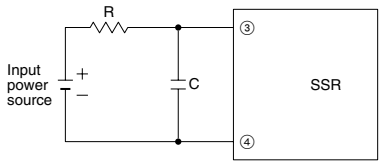
Note: * The Japanese part number is printed on the following accessories in stead of Global part number. Please refer to the below chart for interpretation from Japanese to Global part number.

Products	Japanese Part No.	Global Part No.	Compatible models
Slim heat sink (28 mm)	AQP810	AQP-HS-SJ10A	AQ-J
Slim heat sink (45 mm)	AQP812	AQP-HS-SJ20A	AQ-A, AQ-J
Standard heat sink (10A and 15A)	AQP811	AQP-HS-J10A	AQ-A, AQ-J
Standard heat sink (25A and 40A)	AQP808	AQP-HS-J25A	AQ-A, AQ-J
Standard heat sink (AQ-A 25A)	AQP804	AQP-HS-30/40A	AQ-A
DIN Rail Mounting Plate (for AQ-A and AQ-J)	AQP809	AQP-DPJ	AQ-A, AQ-J
Mounting Rail	ATA48011	AT8-DLA1	AQ-A, AQ-J
Terminal Cover (for AQ-A)	AQA801	AQA801	AQ-A

Cautions for Use

1. Noise and surge protection at the input side

A high noise surge voltage applied to the SSR input circuit can cause malfunction or permanent damage to the device. If such a high surge is anticipated, use C or R noise absorber in the input circuit.

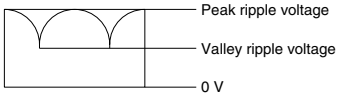


2. When the input terminals are connected with reverse polarity

Reversing the polarity will not cause damage to the device, due to the presence of a protection diode, but the device will not operate.

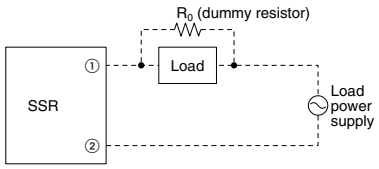
3. In the case of operating voltage containing ripple

If the SSR control voltage contains ripple, the peak of the ripple should not exceed the maximum rated control voltage (32V), and the bottom of the ripple should exceed the minimum rated control voltage (4V).



4. When used for the load less than rated at the output side

An SSR may malfunction if it is used below the specified load. In such an event, use a dummy resistor in parallel with the load.



Set a value of dummy resistor so that the load current becomes 100 mA or more (AQ-A) or 50 mA or more (AQ-J) due to the dummy resister and load.

5. Others

1) If an SSR is used in close proximity to another SSR or heat-generating device, its ambient temperature may exceed the allowable level. Carefully plan SSR layout and ventilation.

2) Terminal connections should be made by referring to the associated wiring diagram.

3) When mounting a heat sink, coat it with a heat conducting compound or similar in order to improve the heat dissipation effect.

4) The product is hot during and immediately after operation. Use caution.

5) When mounting a slim heat sink (AQP-HS-SJ10A, AQP-HS-SJ20A) on a DIN rail, mount it as per the instructions in Note of the dimensional drawing. Mounting in the opposite direction may cause disengagement due to vibration or impact.

6) For higher reliability, check device quality under actual operating conditions.

6. Transportation and storage

1) Extreme vibration during transport will warp the terminal or damage the relay. Handle the carton and case with care.

2) Storage under extreme conditions will cause external appearance defects, and deterioration of the characteristics. The following storage conditions are recommended:

• Temperature: 0 to 45°C 32 to 113°F
• Humidity: Less than 70% R.H.
• Atmosphere: No harmful gasses such as sulfurous acid gas, minimal dust.