



**Slim type SSR for  
1A and 2A control**

# AQ-G RELAYS



**RoHS compliant**

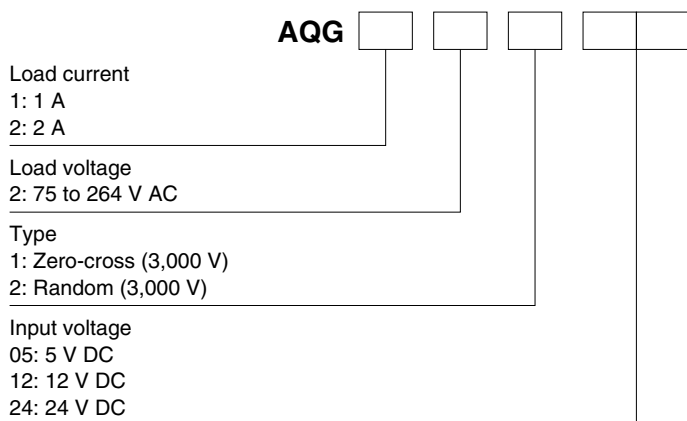
### FEATURES

- 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						
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	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".

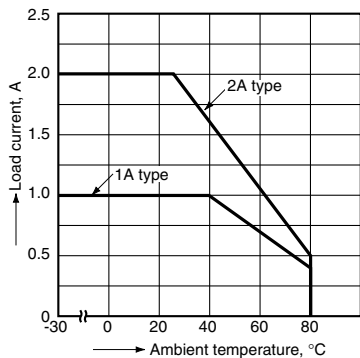
\*4. When the load current is less than the rated minimum load current, please refer to "Cautions for Use of SSR".

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

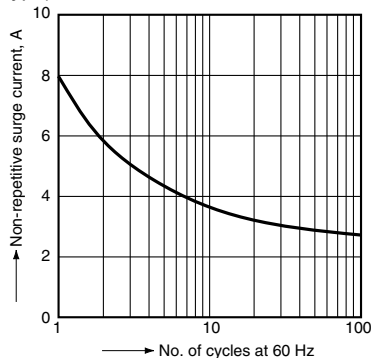
Item	Zero-cross type	Random type	Remarks
Operate time max.	1/2 cycle of voltage sine wave + 1 ms	1 ms	
Release time, max.	1/2 cycle of voltage sine wave + 1 ms		
Insulation resistance, min.	10 <sup>9</sup> Ω between input and output		at 500 V DC
Breakdown voltage	3,000 Vrms between input and output		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 <sup>2</sup>		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

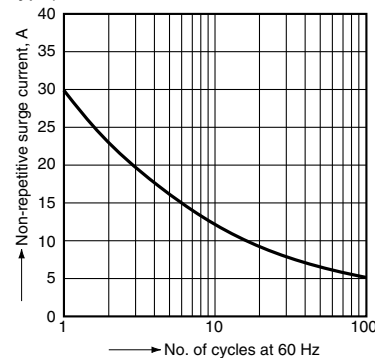
1. Load current vs. ambient temperature



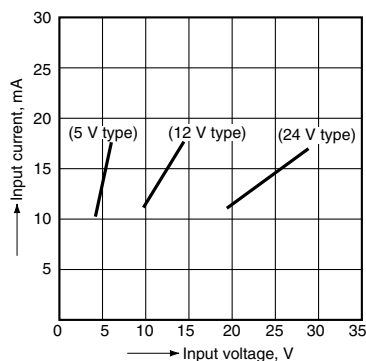
2.-(1) Non-repetitive surge current vs. carrying time (1A type)



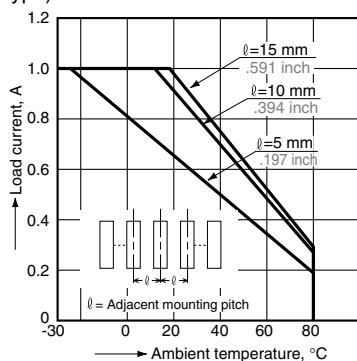
2.-(2) Non-repetitive surge current vs. carrying time (2A type)



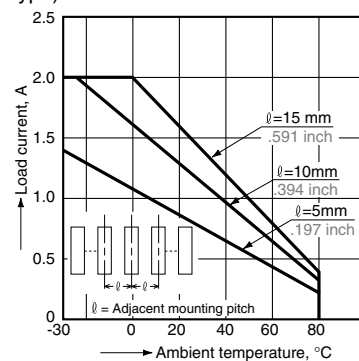
3. Input current vs. input voltage characteristics



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)

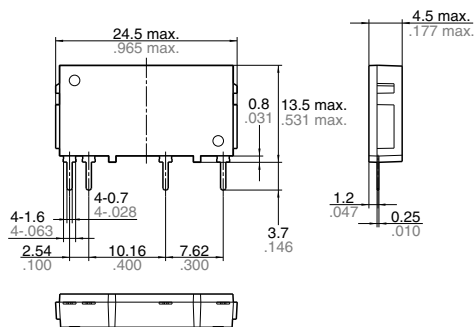
### 1. 1A type

**CAD Data**



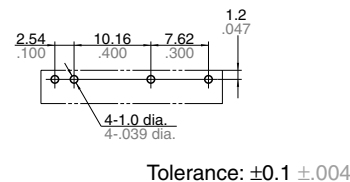
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

#### External dimensions



General tolerance:  $\pm 0.2 \pm .008$

#### PC board pattern (Bottom view)



#### Schematic

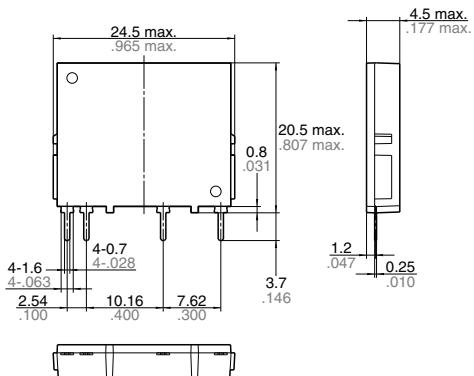


### 2. 2A type

**CAD Data**

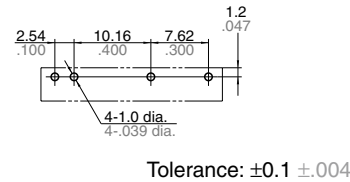


#### External dimensions



General tolerance:  $\pm 0.2 \pm .008$

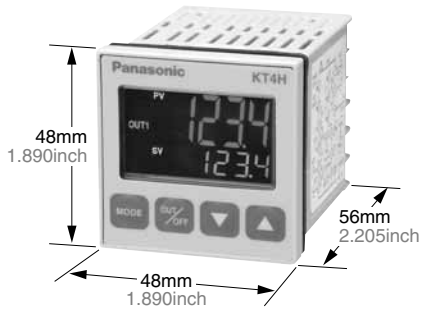
#### PC board pattern (Bottom view)



#### 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/>