

NAIS

## AQ-K SOLID STATE RELAY

AQ-K  
RELAYS

## FEATURES

- 1. Combined with heat sink for slim profile**  
Helps to save space on control panel
- 2. Dielectric voltage of 2,500V or 4,000V**
- 3. Both screw-on installation or one-touch DIN-rail installation available**
- 4. Includes operation LED (red)**
- 5. Built-in varistor**

## APPLICATIONS

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

## TYPES

Type	Load current	Load voltage	Breakdown voltage	Part No.
Zero-cross	15 A	75 to 250V AC	2,500V AC	AQK1211
			4,000V AC	AQK1231
	25 A	75 to 250V AC	2,500V AC	AQK2211
			4,000V AC	AQK2231

## ORDERING INFORMATION

Ex. AQK <span style="border: 1px solid black; padding: 2px 10px;"> </span> <span style="border: 1px solid black; padding: 2px 10px;"> </span> <span style="border: 1px solid black; padding: 2px 10px;"> </span> <span style="border: 1px solid black; padding: 2px 10px;"> </span>			
Load current	Load voltage	Type	Input voltage
1: 15 A 2: 25 A	2: 75 to 250 V DC	1: Zero-cross type (2,500 V) 3: Zero-cross type (4,000 V)	1: 4.5 to 30 V DC

Note: Standard packing: Carton 10 pcs., Case: 60 pcs.

## SPECIFICATIONS

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

1) 10 A type

Items	Type	AQK1211	AQK1231	AQK2211	AQK2231	Remarks
Input side	Input voltage	4.5 to 30V DC				
	Input current, max.	10 mA				
	Drop-out voltage, min.	1 V				
Load side	Max. load current	15 A		25 A		See "REFERENCE DATA 1"
	Load voltage	75 to 250 V AC				
	Frequency	45 to 65 Hz				
	Non-repetitive surge current	150 A		250 A		In one cycle at 60 Hz
	Max. "OFF-state" leakage current	9 mA (when 200 V applied)				at 60 Hz
	Max. "ON-state" voltage drop	1.6 V				at max. carrying current
	Min. load current	100 mA				

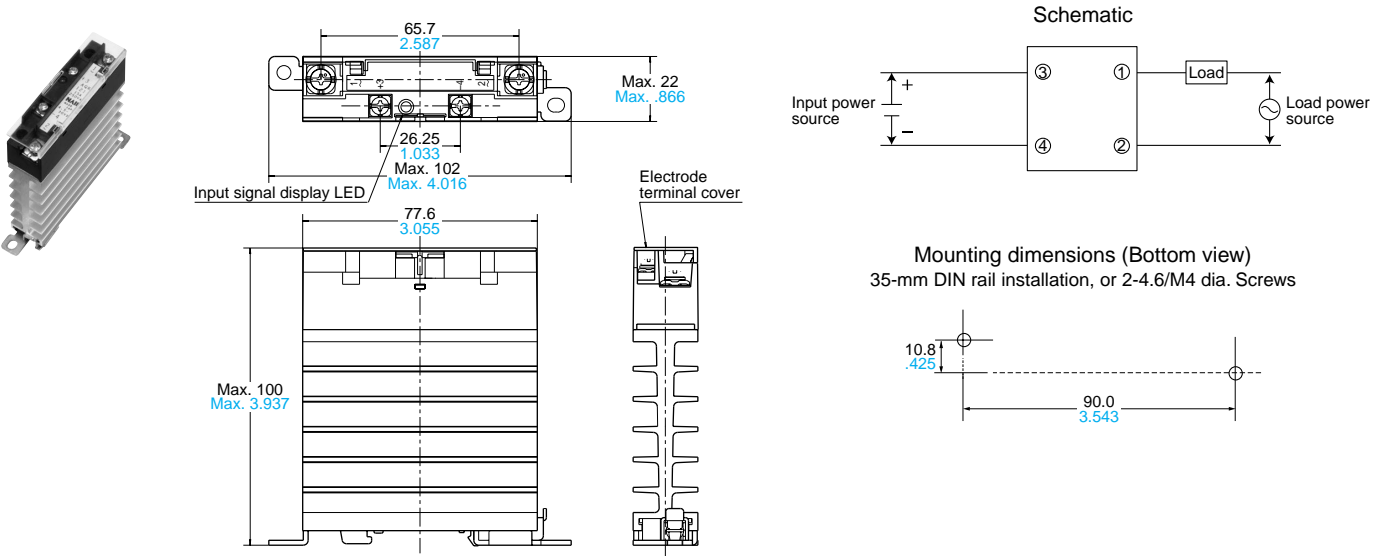
AQ-K

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

Part No.	AQK1211	AQK1231	AQK2211	AQK2231	Remarks
Operate time, max.	(1/2 cycle of voltage sine wave) + 1 ms				
Release time, max.	(1/2 cycle of voltage sine wave) + 1 ms				
Breakdown voltage	2,500 V AC	4,000 V AC	2,500 V AC	4,000 V AC	
Ambient temperature	-30°C to +80°C -22°F to +176°F				Non-condensing at low temperatures
Insulation resistance, min., Initial	100 M Ω between input, output and case				by 500V DC megger
Vibration resistance	10 to 55 Hz at double amplitude of 0.75 mm				For 1 min.
Shock resistance	Min. 294 m/s²				
Storage temperature	-35°C to +100°C -31°F to +212°F				
Operational method	Zero-cross (Turn-ON and Turn-OFF)				

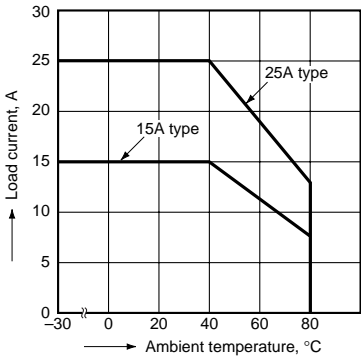
DIMENSIONS

mm inch

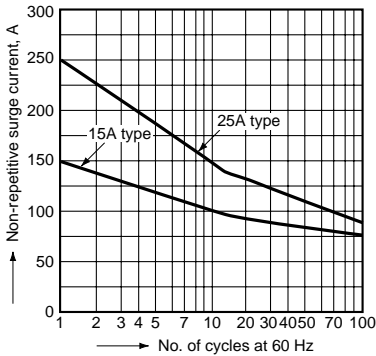


REFERENCE DATA

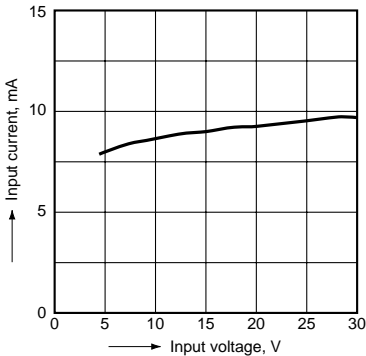
1. Load current vs. ambient temperature characteristics



2. Non-repetitive surge current vs. carrying time (15 A, 25 A type)



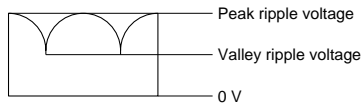
3. Input voltage vs. input current characteristics



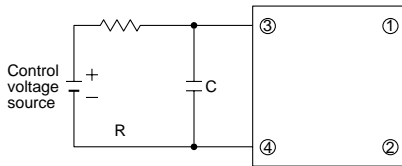
## CAUTIONS FOR USE

### 1. Input side

1) If there are ripples in the input voltage, set the peak to 30 V or less, and the valley to 4.5 V or greater.

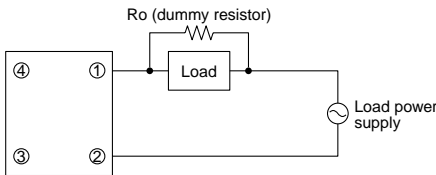


2) A high noise surge voltage applied to the SSR input circuit can cause malfunction or permanent damage to the device. If such a high surge is anticipated, use C or R noise absorber in the input circuit.



### 2. Output side

A high noise surge voltage applied to the SSR load circuit can cause malfunction or permanent damage to the device. If such a high surge is anticipated, use a varistor across the SSR output.



Load specification: Load current min. 100 mA

### 3. When the input terminals are connected with reverse polarity

Reversing the polarity may cause permanent damage to the device. Take special care to avoid polarity reversal or use a protection diode in the input circuit.

### 4. Cleaning solvents compatibility

Dip cleaning with an organic solvent is recommended for removal of solder flux, dust, etc. Select a cleaning solvent from the following table. If ultrasonic cleaning must be used, the severity of factors such as frequency, output power and cleaning solvent selected may cause loose wires and other defects. Make sure these conditions are correct before use. For details, please consult us.

Cleaning solvent		Compatibility (○: Yes X: No)
Chlorine-base	<ul style="list-style-type: none"> <li>• Trichlene</li> <li>• Chloroethylene</li> </ul>	○
Aqueous	<ul style="list-style-type: none"> <li>• Indusco</li> <li>• Hollis</li> <li>• Lonco Terg</li> </ul>	○
Alcohol-base	<ul style="list-style-type: none"> <li>• IPA</li> <li>• Ethanol</li> </ul>	○
Others	<ul style="list-style-type: none"> <li>• Thinner</li> <li>• Gasoline</li> </ul>	X

### 5. Others

1) Make sure that the terminals are wired properly.

2) Be sure to take SSR layout and ventilation into account. Installing a heat source near another solid-state relay could raise the ambient temperature.

3) Handle the exterior and interior boxes with care. Excessive vibration during transport could warp the terminals or damage the unit.

4) Storing the unit under extremely adverse conditions could damage the product's appearance or impact performance.

We recommend that the unit be stored in a location meeting the following requirements:

Temperature: 5 to 30°C 41 to 86°F

Humidity: Max. 60% RH

Atmosphere: Should be free of sulfurous acid and other toxic gasses, and relatively free from dust.

## Thermal Design

SSRs used in high-reliability equipment require careful thermal design. In particular, junction temperature control has a significant effect on device function and life time. The rated load current for board-mounting SSRs is defined as the maximum current allowable at an ambient temperature of 40°C 104°F (30°C 86°F) and under natural cooling.