

Panasonic
ideas for life

**SSR for high-frequency
switching of industrial
equipment**

AQ-F RELAYS



RoHS compliant

FEATURES

1. Suitable for high-capacity and high-frequency switching
2. Same size, same terminal arrangement as HC relay
Sockets for HC relays are applicable
3. Two load types available:
DC output type (2 A, 3 A)
AC output type (2 A, 3 A)
4. Wide range of input voltage:
3 V to 28 V

TYPICAL APPLICATIONS

1. Drive for small-sized motor, heater, solenoid and electromagnetic valves.
2. NC machine
3. Printing machine
4. Machine tool
5. Robot for industrial use
6. Wrapping and packing machine

TYPES

Types	Load current	Load voltage	Input voltage	Part No.
AC output	2A	75 to 250V AC	3 to 28V DC	AQF2A2-ZT3/28V DC
	3A			AQF3A2-ZT3/28V DC
DC output	2A	3 to 60V DC	3 to 28V DC	AQF2AD1-3/28V DC
	3A			AQF3AD1-3/28V DC

Standard packing: Carton: 20 pcs., Case: 200 pcs.

RATING

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

Item		Type	AC output		DC output		Remarks
			2A	3A	2A	3A	
Input side	Input voltage	3 to 28 V DC					*1
	Input impedance	Approx. 1.6 kΩ					
	Drop-out voltage, min.	0.8 V DC					
Load side	Max. load current	2 A*2	3 A*2	2 A*2	3 A*2	Ta = Max. 40°C 104°F	
	Load voltage	75 to 250 V AC		3 to 60 V DC			
	Non-repetitive surge current	80 A*3		5 A*3	6 A*3	AC: In one cycle at 60 Hz DC: 1 s	
	Max. "OFF-state" leakage current	5 mA		1 mA		AC: at 60 Hz 200 V DC: at 60 V	
	Max. "ON-state" voltage drop	1.6 V					at max. carrying current
	Min. load current	50 mA*4		5 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".

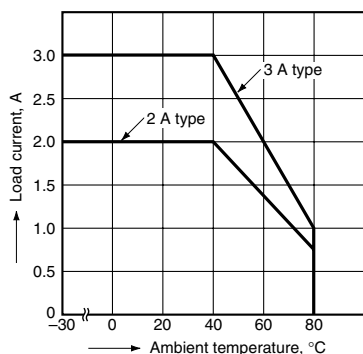
*3. Refer to REFERENCE DATA "2. Non-repetitive surge current vs. carrying time".

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

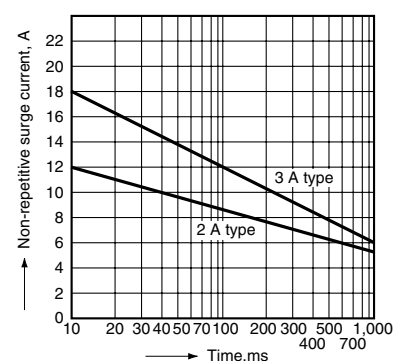
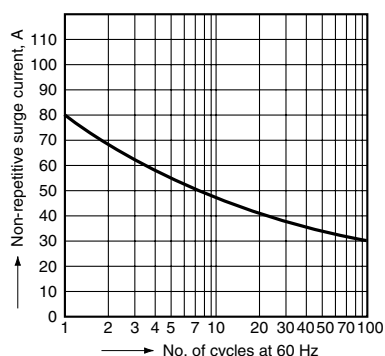
2. Characteristics (Ambient temperature: 20°C 68°F, Input voltage ripple: 1% or less)

Type		AC output		DC output		Remarks
		2A	3A	2A	3A	
Operate time max.		1/2 cycle of voltage sine wave + 1 ms		0.5 ms		
Release time, max.		1/2 cycle of voltage sine wave + 1 ms		2 ms		
Insulation resistance, min.		100 MΩ between input and output				at 500 V DC
Breakdown voltage		2,000 Vrms between input and output				for 1 min.
Vibration resistance	Destructive	10 to 55 Hz double amplitude of 3 mm				1 hour for X, Y, Z axes
	Functional	10 to 55 Hz double amplitude of 3 mm				10 min. for X, Y, Z axes
Shock resistance	Destructive	Min. 980 m/s ² {100 G}				5 times each for X, Y, Z axes
	Functional	Min. 980 m/s ² {100 G}				4 times each for X, Y, Z axes
Ambient temperature		-30°C to +80°C -22°F to +176°F				
Storage temperature		-30°C to +100°C -22°F to +212°F				
Operational method		Zero-cross (Turn-ON and Turn-OFF)		—		

Use load current within range specified in the figure below



2-(2). Non-repetitive surge current vs. carrying time characteristics (DC output type)

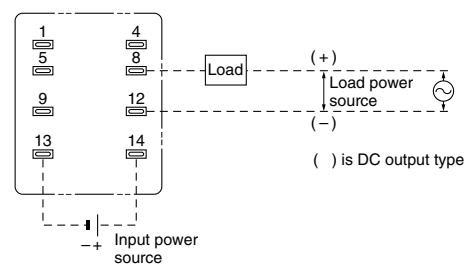
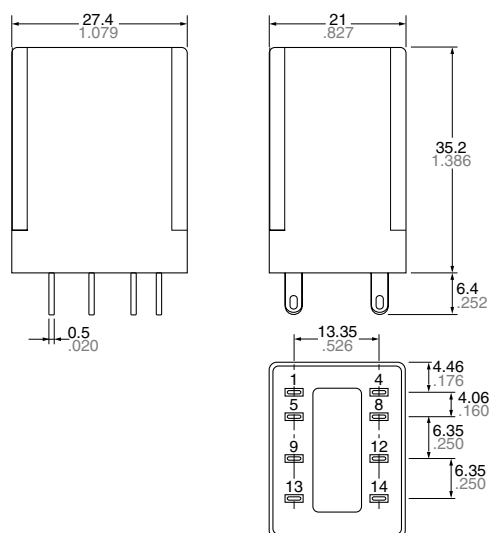


A line graph showing the relationship between Input voltage (V) on the x-axis and Input current (mA) on the y-axis. The x-axis ranges from 3 to 30 with major grid lines every 5 units. The y-axis ranges from 0 to 50 with major grid lines every 5 units. A straight line is plotted, starting at approximately (3, 2) and ending at approximately (28, 18). The line has a positive slope, indicating a linear relationship between voltage and current.

Input voltage, V	Input current, mA
3	2
10	6
15	10
20	14
25	17
28	18

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

Terminal connection diagram (Bottom view)



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

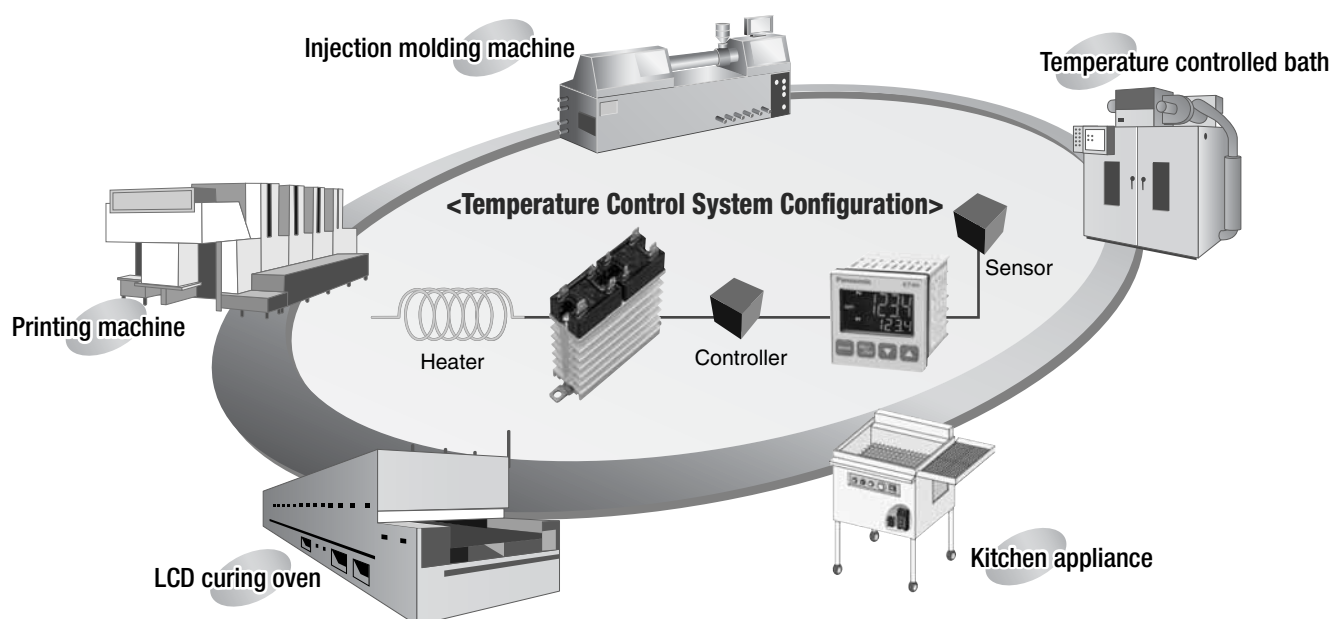
Power supply	Control output	Part No.
100 to 240 V AC	Non-contact voltage output	AKT4H112100

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



APPLICATIONS

Contributing to space savings of various heater control systems



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

Socket of HC relay is available for AQ-F solid state relay.

1. Socket for plug-in type

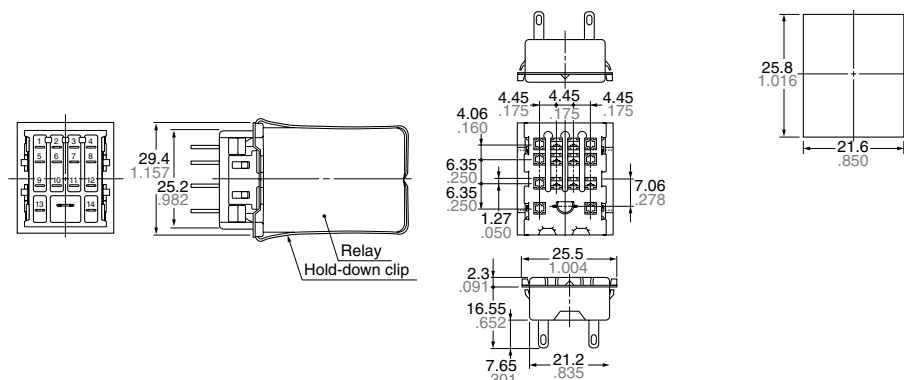
HC2 socket

CAD Data



HC2-SS-K

External dimensions



Note: HC3-SS-K and HC4-SS-K can be also used.

Tolerance: $\pm 0.1 \pm 0.004$

2. Socket for PC board

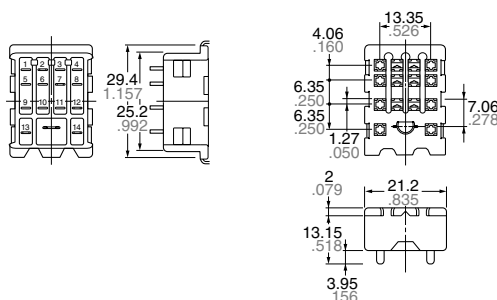
HC2 socket for PC board

CAD Data

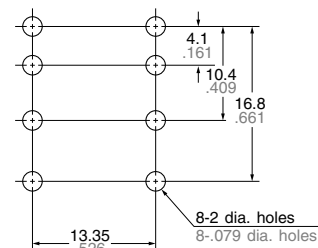


HC2-PS-K

External dimensions



PC board pattern (Bottom view)



Note: HC3-PS-K and HC4-PS-K can be also used.

Tolerance: $\pm 0.1 \pm 0.004$

3. Wrapping socket

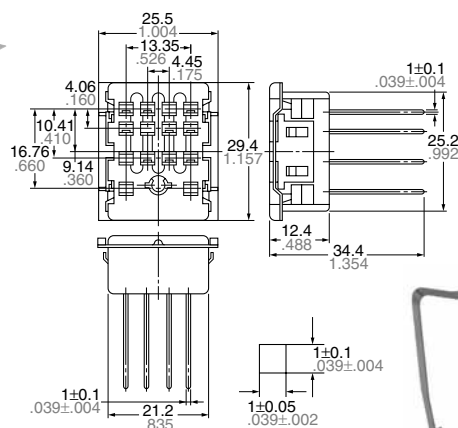
Standard wrapping socket

CAD Data



HC4-WS-K

External dimensions



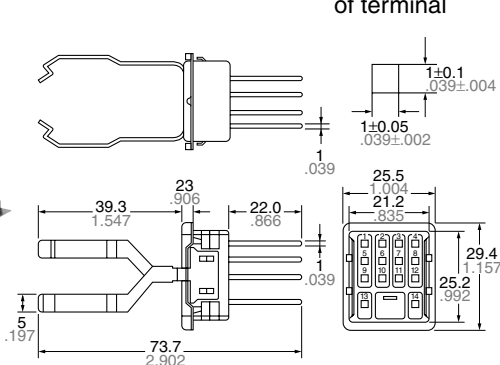
Wrapping socket with lock spring

CAD Data

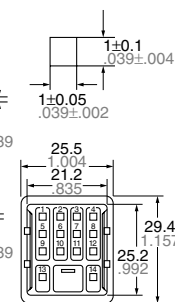


HC4-WS

External dimensions



Cross section of terminal



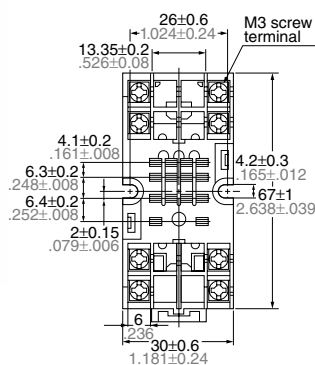
4. DIN rail mounting socket

CAD Data

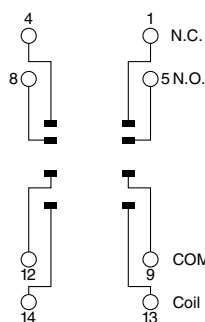


HC2-SFD-K

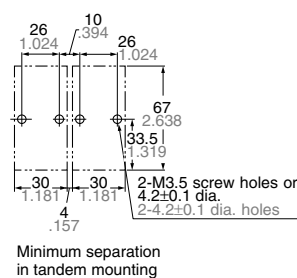
External dimensions



Schematic



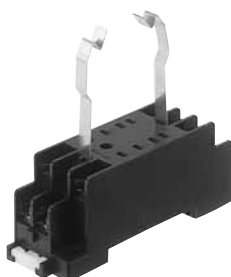
Mounting dimension (Bottom view)



Note: HC3-SFD-K and HC4-SFD-K can be also used.

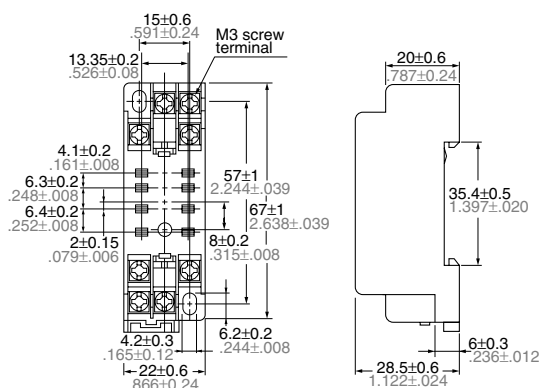
5. DIN socket for HC2-vertical type

CAD Data

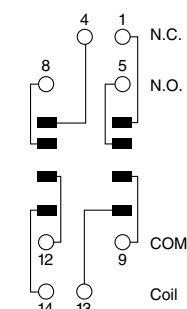


HC2-SFD-S

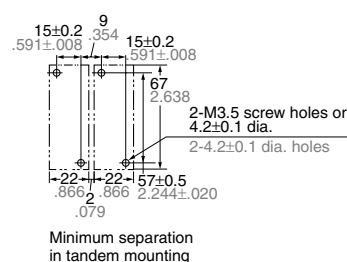
External dimensions



Schematic



Mounting dimension (Bottom view)



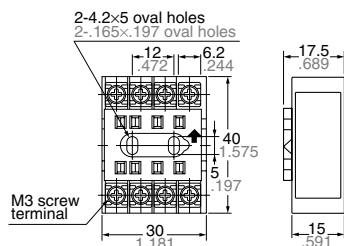
6. General socket

CAD Data

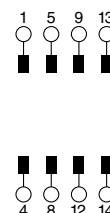


HC2-SF-K

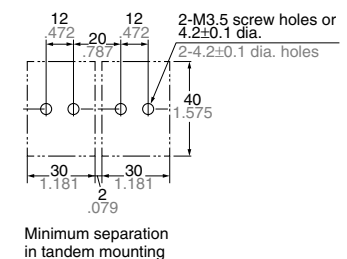
External dimensions



Schematic



Mounting dimension (Bottom view)

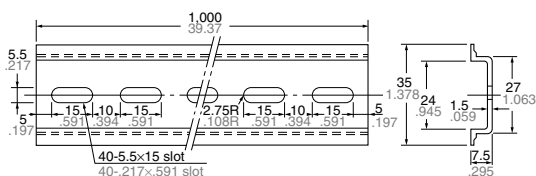


Note: HC3-HSF-K and HC4-HSF-K can be also used.

Mounting rail



AT8-DLA1



Fastening plate



ATA4806

