RV8H Series 6mm Interface Relays

Key features:

- Space-saving 6mm width
- Only 70mm in height from DIN rail
- Gold-plated contacts
- Pre-assembled relay and DIN mount socket
- Universal screw terminals (flat and Phillips)
- Spring clamp terminals
- Universal AC/DC socket with built-in surge suppression and green LED
- Lever for easy locking and removal of relay
- Wide input voltage range: 6 to 240V
- High dielectric strength and impulse withstand voltages
- Reverse Polarity protected
- 400V AC maximum switching voltage
- 1500VA maximum switching power
- RoHS compliant

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c UL us LISTED
(when using combination of RV relay and SV socket)

Part Numbers

Complete Part Numbers (Relay & Socket)

Coil Voltage		Part Number (Standard Stock in bold)	
		Screw Terminal	Spring Clamp Terminal
DC	6V	RV8H-L-D6	RV8H-S-D6
	9V	RV8H-L-D9	RV8H-S-D9
	12V	**RV8H-L-D12**	**RV8H-S-D12**
	18V	RV8H-L-D18	RV8H-S-D18
	24V	**RV8H-L-D24**	**RV8H-S-D24**
AC/DC	12V	**RV8H-L-AD12**	**RV8H-S-AD12**
	18V	RV8H-L-AD18	RV8H-S-AD18
	24V	**RV8H-L-AD24**	**RV8H-S-AD24**
	48V	RV8H-L-AD48	RV8H-S-AD48
	60V	RV8H-L-AD60	RV8H-S-AD60
	110V - 125V	**RV8H-L-AD110**	**RV8H-S-AD110**
	220V - 240V	**RV8H-L-AD220**	**RV8H-S-AD220**

Standard stock models in bold.

Accessories

Item	Color	Part Number
Jumper (20 combs[1]) 	Black	SV9Z-J20B
	Gray	SV9Z-J20W
	Blue	SV9Z-J20S
Spacer (circuit separator)[2] 	–	SV9Z-SA2W
Screwdriver 	Blue	BC1S-SD0

1. Jumper combs come with 20 points, if shorter lengths are needed simply cut off the excess points.
2. Width of spacer: 2mm

Note: When using a cut jumper, please use a spacer on the cut side. For additional information see instruction sheet.

Marking Plates

Item	Part Number	Engraving
 Vertical Orientation	SV9Z-PW10	blank
	SV9Z-PW10-①1-10	1-10
	SV9Z-PW10-①11-20	11-20
	SV9Z-PW10-①21-30	21-30
	SV9Z-PW10-①31-40	31-40
	SV9Z-PW10-①41-50	41 -50
	SV9Z-PW10-①51-60	51-60
	SV9Z-PW10-①61-70	61-70
 Horizontal Orientation	SV9Z-PW10-①71-80	71-80
	SV9Z-PW10-①81-90	81-90
	SV9Z-PW10-①91-100	91-100
	SV9Z-PW10-①A-J	A-J
	SV9Z-PW10-①K-T	K-T
	SV9Z-PW10-①U-Z	U-Z
	SV9Z-PW10-①GROUND	GROUND
	SV9Z-PW10-①AC	AC

1. In place of ① insert orientation code: V=Vertical, H=Horizontal
2. Each unit has 10 pieces (marking plates).

Replacement Parts

	Complete Part Number	Applicable Socket Part Number	Applicable Relay Part Number
Screw Terminals	RV8H-L-D6	SV1H-07L-5	RV1H-G-D5
	RV8H-L-D9		RV1H-G-D9
	RV8H-L-D12		RV1H-G-D12
	RV8H-L-D18		RV1H-G-D18
	RV8H-L-D24		RV1H-G-D24
	RV8H-L-AD12	SV1H-07L-1	RV1H-G-D12
	RV8H-L-AD18		RV1H-G-D18
	RV8H-L-AD24		RV1H-G-D24
	RV8H-L-AD48	SV1H-07L-2	RV1H-G-D48
	RV8H-L-AD60		RV1H-G-D60
	RV8H-L-AD110	SV1H-07L-3	RV1H-G-D60
	RV8H-L-AD220	SV1H-07L-4	RV1H-G-D60

	Complete Part Number	Applicable Socket Part Number	Applicable Relay Part Number
Spring Clamp Terminals	RV8H-S-D6	SV1H-07LS-5	RV1H-G-D5
	RV8H-S-D9		RV1H-G-D9
	RV8H-S-D12		RV1H-G-D12
	RV8H-S-D18		RV1H-G-D18
	RV8H-S-D24		RV1H-G-D24
	RV8H-S-AD12	SV1H-07LS-1	RV1H-G-D12
	RV8H-S-AD18		RV1H-G-D18
	RV8H-S-AD24		RV1H-G-D24
	RV8H-S-AD48	SV1H-07LS-2	RV1H-G-D48
	RV8H-S-AD60		RV1H-G-D60
	RV8H-S-AD110	SV1H-07LS-3	RV1H-G-D60
	RV8H-S-AD220	SV1H-07LS-4	RV1H-G-D60

Specifications

Number of Poles		1 pole
Contact Configuration		1 form C (SPDT)
Contact material		AgNi (Au plating)
Degree of Protection		IP20
Dielectric strength	Between contact and coil	4,000V AC for 1min
	Between pole	1,000V AC for 1min
Vibration Resistance	Operating extremes	NO: Frequency 10 to 55Hz, Amplitude 1.0mm NC: Frequency 10 to 55Hz, Amplitude 0.4mm
	Damage limits	NO: Frequency 10 to 55Hz, Amplitude 0.5mm NC: Frequency 10 to 55Hz, Amplitude 0.2mm
Shock Resistance	Operating extremes	NO: 49m/s^2 (5G) NC: 29.4m/s^2 (3G)
	Damage limits	980m/s^2 (10G)
Mechanical Life (without load)		Over 10,000,000 operations
Operating Temperature		-40 to +70°C without freezing (-40 to +55°C for RV8H-L-AD110, AD220, RV8H-S-AD110, AD220)
Operating Humidity		5 to 85% (without condensation)
Weight		30g (RV8H-L), 26g (RV8H-S)

*Operation frequency 1800 operations per hour.

Contact Ratings

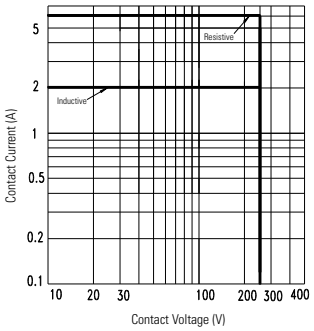
Allowable contact power	Resistive load	1500VA, 180W
Rated Load	Resistive load	250V AC 6A, 30V DC 6A
Allowable Switching Current		6A
Allowable Switching Voltage		400VAC, 125VDC
Allowable Switching Power		1500VA, 180W
Minimum Applicable Load		6VDC/10mA

Coil Ratings

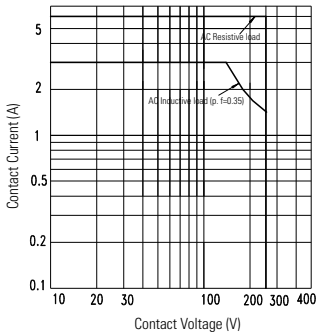
Rated Voltage		Rated Current +-15% (mA)	Circuit AC Resistance +-10% (Ω)	Circuit DC Resistance +-10% (Ω)	Operating Characteristics			Power Consumption
					Pickup Voltage	Dropout Voltage	Maximum Allowable voltage	
DC	6V	35	-	170	90% max	7% min	110%	0.21W
	9V	18.6	-	485				0.2W
	12V	14.6	-	820				0.2W
	18V	11.6	-	1550				0.2W
	24V	10.6	-	2270				0.25W
AC/DC	12V	15.5	755	800			110%	0.2W
	18V	13.3	1365	1345				0.25W
	24V	13.7	1730	1790				0.33W
	48V	4	11880	12230				0.2W
	60V	3.4	17600	17910				0.2W
	110V - 125V	3.4 - 3.9	31790 - 31890	32450 - 32900				0.5W
	220V - 240V	3.3 - 3.6	65670 - 66070	65940 - 68570				0.85W

RV1H Relay

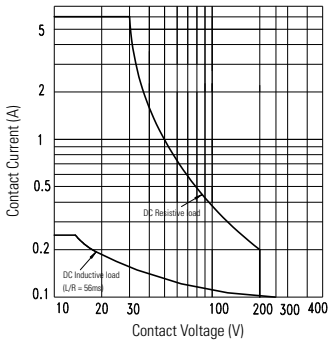
Contact Ratings



Maximum Switching Power AC

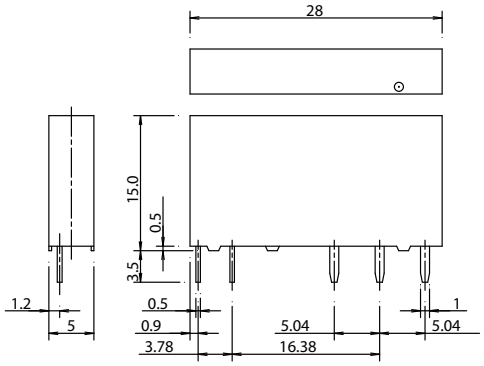


Maximum Switching Power DC



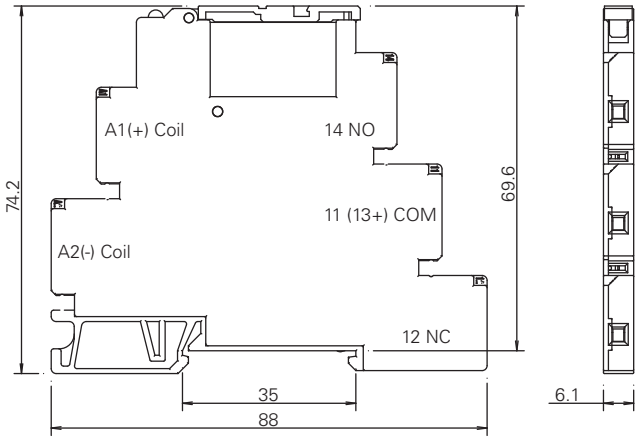
Dimensions (mm)

RV1H-G Relay

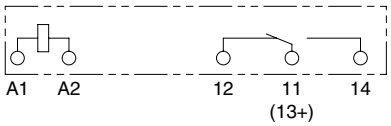


Note: Drawings are not to scale.

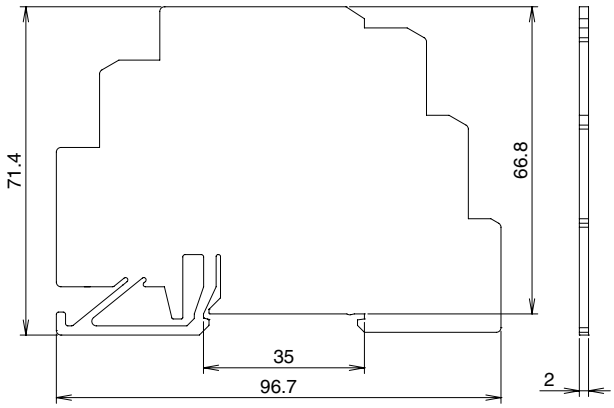
RV8H-L Screw Terminal



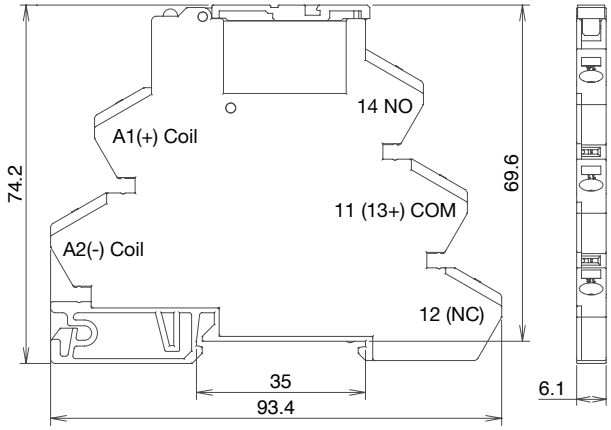
Internal Connection (bottom view)



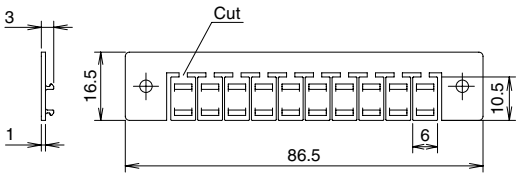
SV9Z-SA2W



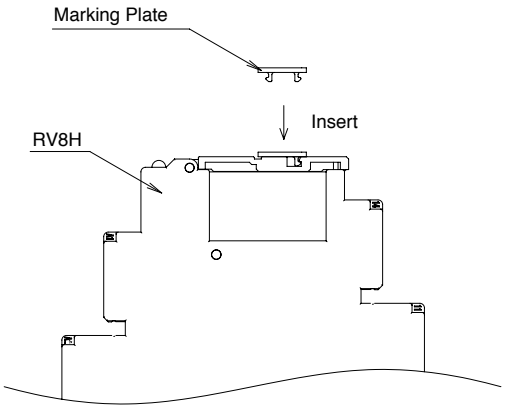
RV8H-S Spring Clamp Terminal



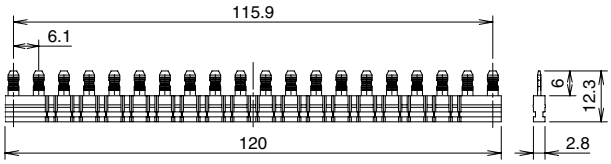
SV9Z-PW10



Marking Plate Placement



SV9Z-J20*



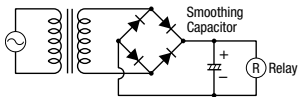
*Available in black, gray and blue.

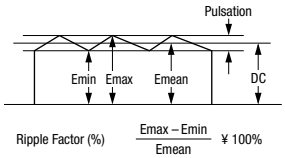
Operating Instructions

Driving Circuit for Relays

1. To ensure correct relay operation, apply rated voltage to the relay coil.

2. Input voltage for the DC coil:
   A complete DC voltage is best for the coil power to make sure of stable relay operation. When using a power supply containing a ripple voltage, suppress the ripple factor within 5%. When power is supplied through a rectification circuit, the relay operating characteristics, such as pickup voltage and dropout voltage, depend on the ripple factor. Connect a smoothing capacitor for better operating characteristics as shown below.



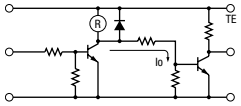


$$\text{Ripple Factor (\%)} = \frac{\text{Emax} - \text{Emin}}{\text{Emean}} \times 100\%$$

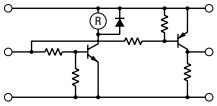
Emax = Maximum of pulsating current
Emin = Minimum of pulsating current
Emean = DC mean value

3. Leakage current while relay is off:
   When driving an element at the same time as the relay operation, special consideration is needed for the circuit design. As shown in the incorrect circuit below, leakage current (Io) flows through the relay coil while the relay is off. Leakage current causes coil release failure or adversely affects the vibration resistance and shock resistance. Design a circuit as shown in the correct example.

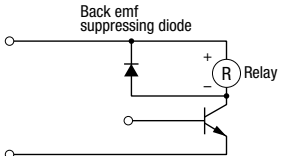
Incorrect



Correct



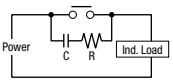
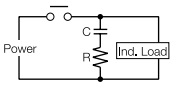
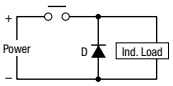
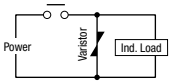
4. Surge suppression for transistor driving circuits:
   When the relay coil is turned off, a high-voltage pulse is generated, causing a transistor to deteriorate and sometimes to break. Be sure to connect a diode to suppress the back electromotive force. Then, the coil release time becomes slightly longer. To shorten the coil release time, connect a Zener diode between the collector and emitter of the transistor. Select a Zener diode with a Zener voltage slightly higher than the power voltage.



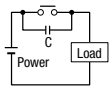
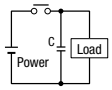
Protection for Relay Contacts

1. The contact ratings show maximum values. Make sure that these values are not exceeded. When an inrush current flows through the load, the contact may become welded. If this is the case, connect a contact protection circuit, such as a current limiting resistor.

2. Contact protection circuit:
   When switching an inductive load, arcing causes carbides to form on the contacts, resulting in increased contact resistance. In consideration of contact reliability, contact life, and noise suppression, use of a surge absorbing circuit is recommended. Note that the release time of the load becomes slightly longer. Check the operation using the actual load. Incorrect use of a contact protection circuit will adversely affect switching characteristics. Four typical examples of contact protection circuits are shown in the following table:

RC		This protection circuit can be used when the load impedance is smaller than the RC impedance in an AC load power circuit. • R: Resistor of approximately the same resistance value as the load • C:0.1 to 1 µF
		This protection circuit can be used for both AC and DC load power circuits. R: Resistor of approximately the same resistance value as the load C: 0.1 to 1 µF
Diode		This protection circuit can be used for DC load power circuits. Use a diode with the following ratings. Reverse withstand voltage: Power voltage of the load circuit x 10 Forward current: More than the load current
Varistor		This protection circuit can be used for both AC and DC load power circuits. For a best result, when using a power voltage of 24 to 48V AC/DC, connect a varistor across the load. When using a power voltage of 100 to 240V AC/DC, connect a varistor across the contacts.

3. Do not use a contact protection circuit as shown below:

	This protection circuit is very effective in arc suppression when opening the contacts. But, the capacitor is charged while the contacts are opened. When the contacts are closed, the capacitor is discharged through the contacts, increasing the possibility of contact welding.
	This protection circuit is very effective in arc suppression when opening the contacts. But, when the contacts are closed, a current flows to charge the capacitor, causing contact welding.

Generally, switching a DC inductive load is more difficult than switching a DC resistive load. Using an appropriate arc suppressor, however, will improve the switching characteristics of a DC inductive load.

Soldering

1. When soldering the relay terminals, use a soldering iron of 30 to 60W, and quickly complete soldering (within approximately 3 seconds).

2. Use a non-corrosive rosin flux.

Operating Instructions con't

Other Precautions

1. General notice:
   To maintain the initial characteristics, do not drop or shock the relay.

   The relay cover cannot be removed from the base during normal operation. To maintain the initial characteristics, do not remove the relay cover.

   Use the relay in environments free from condensation, dust, sulfur dioxide (SO_2), and hydrogen sulfide (H_2S).

   Make sure that the coil voltage does not exceed applicable coil voltage range.

2. UL and CSA ratings may differ from product rated values determined by IDEC.

3. Do not use relays in the vicinity of strong magnetic field, as this may affect relay operation.

Safety Precautions

- Turn off the power to the relay before starting installation, removal, wiring, maintenance, and inspection of the relays. Failure to turn power off may cause electrical shock or fire hazard.
- Observe specifications and rated values, otherwise electrical shock or fire hazard may be caused.
- Use wires of the proper size to meet voltage and current requirements. Tighten the terminal screws on the relay socket to the proper tightening torque.
- Surge absorbing elements on AC relays with RC or DC relays with diode are provided to absorb the back electromotive force generated by the coil. When the relay is subject to an excessive external surge voltage, the surge absorbing element may be damaged. Add another surge absorbing provision to the relay to prevent damage.

Precautions for the RU Relays

- Before operating the latching lever of the RU relay, turn off the power to the RU relay. After checking the circuit, return the latching lever to the original position.
- Do not use the latching lever as a switch. The durability of the latching lever is a minimum of 100 operations.
- When using DC loads on 4PDT relays, apply a positive voltage to terminals of neighboring poles and a negative voltage to the other terminals of neighboring poles to prevent the possibility of short circuits.
- DC relays with a diode have a polarity in the coil terminals. Apply the DC voltage to the correct terminals.