RU Series — General Purpose Relays

Key features of the RU series include:

- **Non-polarized LED indicator standard**
- **Solder-free construction (spot welded, no solder points, lead-free)**
- **No internal wires**
- **Mechanical flag indicator standard**
- **Manual latching lever with color coding for AC or DC coil**
- **Available without latching lever (or with momentary check button)**
- **Snap-on marking plate standard**
- **Cadmium-free contacts - RoHS compliant**
- **Color coded coils for visual distinction**
- **Contact rating 6A: 4PDT**
  10A: DPDT

Specifications

	RU2	RU4
Contact Material	AgSnOIn (silver tin oxide indium)	AuAg/Ag (gold-silver alloy on silver)
Contact Resistance	50 mΩ maximum	
Minimum Applicable Load	24VDC, 5mA (reference value)	1V DC, 1mA (standard) 1V DC, 0.1mA (bifurcated)
Operating Time	20 msec maximum	
Release Time	20 msec maximum	
Maximum Continuous Applied Voltage (AC/DC) at 20°C	110%	
Minimum Operating Voltage (AC/DC) at 20°C	80%	
Drop-Out Voltage (AC) at 20°C	30%	
Drop-Out Voltage (DC) at 20°C	10%	
Power Consumption	1.1-1.4VA (AC); 0.9-1.0W (DC)	
Dielectric Strength	Between contact and coil: 2,500VAC, 1 minute Between poles: 2,500VAC, 1 minute Between contacts of the same pole: 1,000VAC, 1 minute	Between contact and coil: 2,500VAC, 1 minute Between poles: 2,000VAC, 1 minute Between contacts of the same pole: 1,000VAC, 1 minute
Frequency Response	1,800 operations/hr	
Vibration Resistance	Operating extremes: 10 to 55Hz, Amplitude 1.0 mm p-p Damage limits: 10 to 55Hz, Amplitude 1.0 mm p-p	
Shock Resistance	Operating extremes: 150 m/s^2 (15G) Damage limits: 1,000 m/s^2 (100G)	
Life Expectancy	Mechanical: AC: 20,000,000 operations minimum DC: 30,000,000 operations minimum Electrical: see electrical life curve	
Degree of Protection	IP40	
Operating Temperature	-55 to +70°C (no freezing)	
Weight	35g	

cULus UL Recognized
File No. E66043, Vol 8, sec. 1
Vol 8, sec. 2

TÜV PRODUCT SERVICE B020813332451

CSA Certified
File No. LR35144-135844

CE

Ordering Information

Consult factory for other voltages.

Basic Part No. **Coil Voltage:**

RU 4 S – ( ) – D12

# of Contacts
2 = DPDT
4 = 4PDT
42 = 4PDT bifurcated contacts

Option*
(Blank) = with latching check button
C = without check button
M = momentary check button
D = surge suppression diode (DC coils only)

Coil Voltage Code**
D12 = 12V DC
D24 = 24V DC
D110 = 110V DC
A24 = 24V AC
A110 = 110-120V AC
A220 = 220-240V AC

*1. *All come with bi-polar LED, mechanical flag indicator, marking plate.*
*2. **Contact IDEC for other voltages.*

Part Numbers

Part Numbers: RU Series with Options

Termination		Contact Configuration	Standard	Without Latching Lever	With Momentary Check Button	With Diode*
S: Solder/plugin	Standard	DPDT	RU2S	RU2S-C	RU2S-M	RU2S-D
		4PDT	RU4S	RU4S-C	RU4S-M	RU4S-D
	Bifurcated	4PDT	RU42S	RU42S-C	RU42S-M	RU42S-D

**DC coils only.*

Part Numbers: Sockets

Relays	Spring Clamp DIN Rail Mount	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel Mount	PC Mount
RU2S	SU2S-11L	SM2S-05	SM2S-05C	SY4S-51	SY4S-61 SY4S-62
RU4S	SU4S-11L	SY4S-05	SY4S-05C		

See Section F for details on sockets. All DIN rail mount sockets shown above can be mounted using DIN rail BNDN1000.

Springs & Clips (optional)	
Part Number	Use With
SFA-101① SFA-202② SY4S-02F1③	use with SY4S-05, -05C SM2S-05, -05C SU4S-11L, SU2S-11L
SFA-301① SFA-302② SY4S-51F1③	use with SY4S-51, -61

① Top latch
② Side latch
③ Pullover spring

Part Numbers: Marking Strip

Item	Part Number	Quantity
RU Marking Strip	RU9Z-P①PN10,	10 pieces per package

In place of ①, insert color code from chart at right.

Marking Strip Color Code

Color	Code	Color	Code
Yellow*	Y	Blue	S
Green	G	White	W
Amber	A		

**yellow marking strip standard on all RU relays.*

Ratings

Coil Ratings

Rated Voltage		Voltage Code	Coil Tape Colors	Rated Current ±15% at 20°C	Coil Resistance ±10% at 20°C	Inrush Current	Inductance	
							Energizing	De-Energizing
AC	24V	A24	white	37.5mA	164 Ω	60mA	1.8H	0.96H
	110-120V	A110	dark blue	8.4mA	4,550 Ω	14mA	36H	22H
	220-240V	A220	red	4.2mA	18,230Ω	7mA	144H	87H
DC	12V	D12	yellow*	83.3mA	160 Ω	N/A		
	24V	D24	green	41.7mA	605 Ω			
	110V	D110	yellow*	9.1mA	12, 100 Ω			

**Voltage printed in black.*

Contact Ratings (Standard)

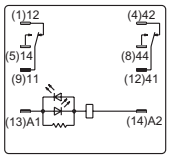
Voltage		Resistive	Inductive
30V DC	DPDT	10A	5A
	4PDT	6A	3A
110V DC	DPDT	0.6A	0.3A
	4PDT	0.4A	0.2A
120V AC	DPDT	10A	5A
	4PDT	6A	3A
240V AC	DPDT	10A	5A
	4PDT	6A	3A

Contact Ratings (Bifurcated)

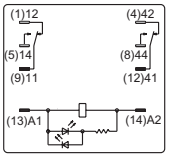
Voltage		Resistive	Inductive
30V DC	4PDT	3A	1.5A
110V DC	4PDT	–	–
120V DC	4PDT	3A	0.8A
250V DC	4PDT	3A	0.8A

Internal Circuit*

RU2S Standard

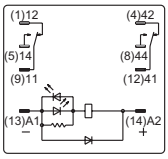


Over 24V AC/DC

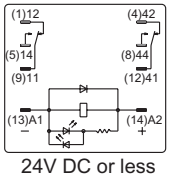


24V AC/DC or less

RU2S-D with Diode

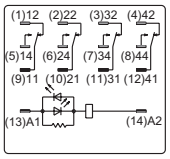


Over 24V DC

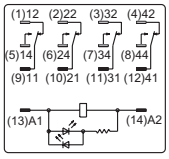


24V DC or less

RU4S/RU42S Standard

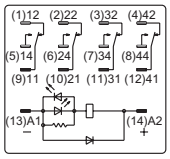


Over 24V AC/DC

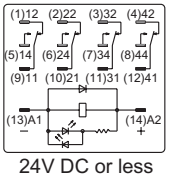


24V AC/DC or less

RU4S-D/RU42S-D with Diode



Over 24V DC



24V DC or less

Image as viewed from bottom of relay. Refer to socket for exact wiring layout (Section F).

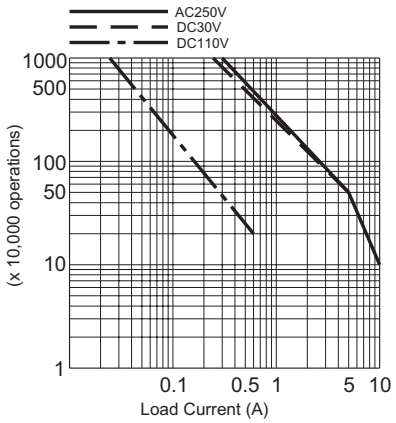
Numbers not in parenthesis follow international system of labeling terminals.

E

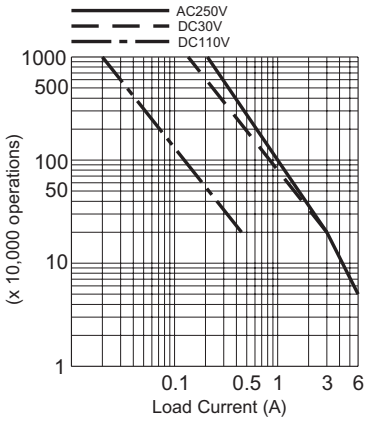
Relays

Electrical Life Curves

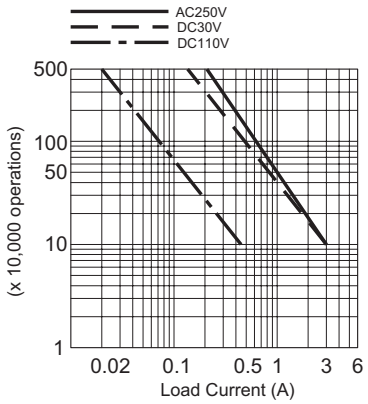
RU2 (Resistive Load)



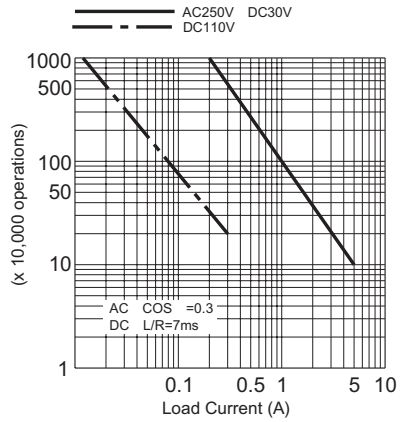
RU4 (Resistive Load)



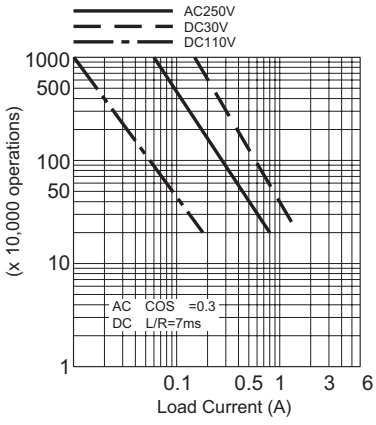
RU42 (Resistive Load)



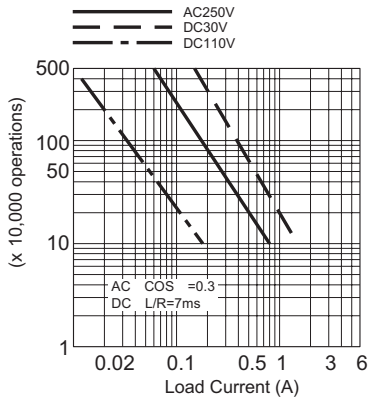
RU2 (Inductive Load)



RU4 (Inductive Load)

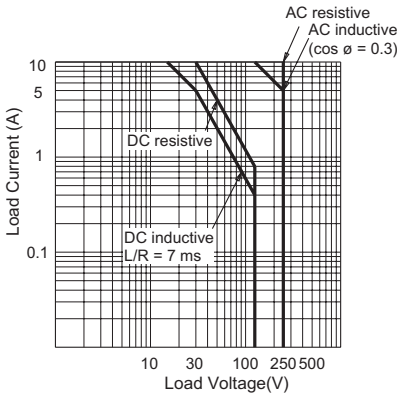


RU42 (Inductive Load)

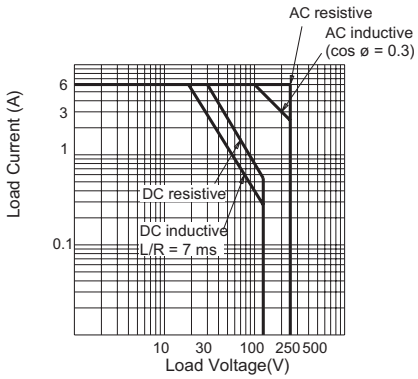


Maximum Switching Capacity

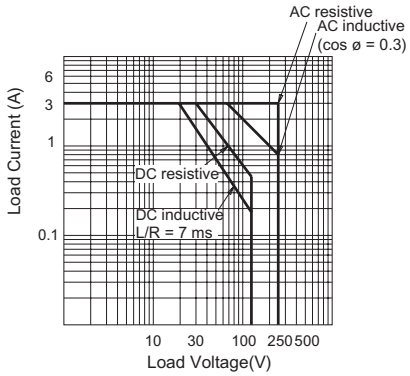
RU2 (Maximum Load)



RU4 (Maximum Load)

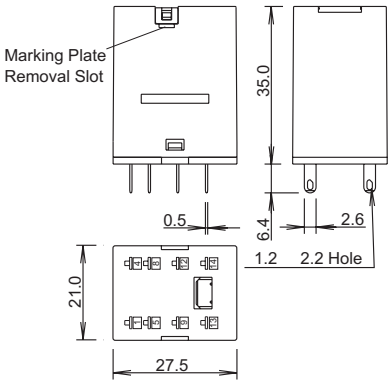


RU42 (Maximum Load)



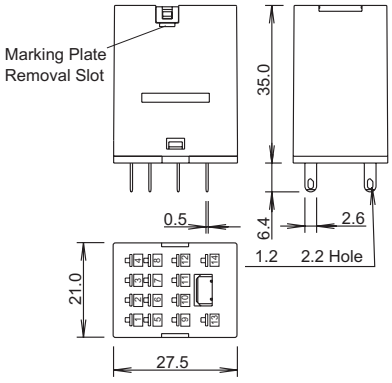
Dimensions & Mounting Hole Layouts

RU2
Dimensions



Marking plate removal slot is provided only on one side.
Insert a flat screwdriver into the slot to remove the marking plate.

RU4/RU42
Dimensions



Marking plate removal slot is provided only on one side.
Insert a flat screwdriver into the slot to remove the marking plate.

Dimensions are in mm.

RU Series Universal Relays

Key features:

- Full featured universal miniature relays
- Designed with environment taken into consideration
- Two terminal styles: plug-in and PCB mount
- Non-polarized LED indicator
- No internal wires, lead-free construction
- Cadmium-free contacts
- Mechanical flag indicator
- Manual latching lever with color coding for AC or DC coil
- Snap-on yellow marking plate; optional marking plates are available in four other colors
- Maximum contact ratings: 10A (RU2), 6A (RU4), 3A (RU42)
- UL Recognized, CSA Certified, EN Compliant

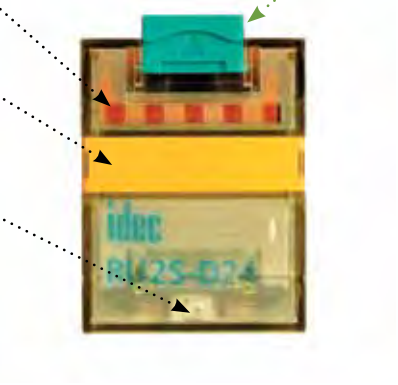
EN61810-1

With Latching or Momentary Lever

Mechanical Indicator*
The contact position can be confirmed through the five small windows.

Marking Plate
Standard yellow marking plate is easily replaced with optional marking plates in four colors for easy identification of relays.

LED Indicator*
Non-polarized green LED indicator is standard provision for plug-in terminal, latching lever types



Latching and Momentary Lever
Using the lever, operation can be checked without energizing the coil. The lever is color coded for AC and DC coils.

	Latching	Momentary
AC coil:	Orange	Red
DC coil:	Green	Blue

In Normal Operation

Note: Turn off the power to the relay coil when using the latching lever. After checking the operation, return the latching lever in the normal position.

Standard (without lever)

AC/DC Color Marking
For identification of AC or DC coils.
AC coil: Yellow
DC coil: Blue

Mechanical Indicator*

Marking Plate

LED Indicator*
Non-polarized green LED indicator is standard provision for plug-in terminal types.

AC Coil DC Coil

Coil Voltage	Tape Color
24V AC	White
100 to 110V AC	Clear
110 to 120V AC	Blue
200 to 220V AC	Black
220 to 240V AC	Red
24V DC	Green
6V DC	Voltage marking on yellow tape
12V DC	
48V DC	
110V DC	

*Not available on PCB type.

Part Number Selection

Contact	Model	Part Number: Standard	Part Number: With Latching Lever	Part Number: With Momentary Lever	Coil Voltage Code (Standard Stock in bold)
DPDT (10A) 	Standard	RU2S-C-□	RU2S-□	RU2S-M-□	A24, **A110**, **A220** D6, D12, **D24**, D48, D110
	With RC (AC coil only)	RU2S-CR-□	RU2S-R-□	RU2S-MR-□	A110, A220
	With diode (DC coil only)	RU2S-CD-□	RU2S-D-□	RU2S-MD-□	D6, D12, **D24**, D48, D110
	PCB	RU2V-NF-□	—	—	A24, A110, A220 D6, D12, **D24**, D48, D110
4PDT (6A) 	Standard	RU4S-C-□	RU4S-□	RU4S-M-□	A24, **A110**, **A220** D6, D12, **D24**, D48, D110
	With RC (AC coil only)	RU4S-CR-□	RU4S-R-□	RU4S-MR-□	A110, A220
	With diode (DC coil only)	RU4S-CD-□	RU4S-D-□	RU4S-MD-□	D6, D12, D24, D48, D110
	PCB	RU4V-NF-□	—	—	A24, **A110**, A220 D6, D12, **D24**, D48, D110
4PDT Bifurcated (3A) 	Standard	RU42S-C-□	RU42S-□	RU42S-M-□	A24, A110, A220 D6, D12, **D24**, D48, D110
	With RC (AC coil only)	RU42S-CR-□	RU42S-R-□	RU42S-MR-□	A110, A220
	With diode (DC coil only)	RU42S-CD-□	RU42S-D-□	RU42S-MD-□	D6, D12, D24, D48, D110
	PCB	RU42V-NF-□	—	—	A24, A110, A220 D6, D12, **D24**, D48, D110

1. Plug-in terminal models have an LED indicator and a mechanical indicator as standard.
2. PCB models do not have an LED indicator or a mechanical indicator.

Ordering Information

When ordering, specify the Part No. and coil voltage code:

(example) **RU2S-C** **A110**

Part No. — Coil Voltage Code

Coil Voltage Table

Coil Voltage Code	A24	A110	A220	D6	D12	D24	D48	D110
Coil Rating	24V AC	110-120V AC	220-240V AC	6V DC	12V DC	24V DC	48V DC	110V DC

Sockets

Relays	Spring Clamp DIN Rail Mount	Standard DIN Rail Mount	Finger-safe DIN Rail Mount	Panel Mount	PCB Mount
RU2S (DPDT)	SU2S-11L	SM2S-05	SM2S-05C	SY4S-51	SM2S-61 SM2S-62
RU4S (4PDT) RU42S (4PDT)	SU4S-11L	SY4S-05	SY4S-05C		SY4S-61 SY4S-62
					

Hold Down Springs & Clips

Appearance	Item	Relay	For DIN Mount Socket	For Through Panel & PCB Mount Socket
	Pullover Wire Spring	RU2S/RU4S/ RU42S	SY4S-02F1	SY4S-51F1
	Leaf Spring (side latch)	RU2S/RU4S/ RU42S	SFA-202*	SFA-302*
	Leaf Spring (top latch)	RU2S/RU4S/ RU42S	SFA-101*	SFA-301*

Note: Order 2 pieces for each relay

Accessories

Name	Part Number	Color Code *
Marking Plate	RU9Z-P*	A (orange), G (green), S (blue), W (white), Y (yellow)

Specify a color code when ordering. The marking plate can be removed from the relay by inserting a flat screwdriver under the marking plate.

Specifications

Model (Contact)	RU2 (DPDT)	RU4 (4PDT)	RU42 (4PDT-bifurcated)
Contact Material	Silver alloy	Silver (gold clad)	Silver-nickel (gold clad)
Contact Resistance [1]	50 mΩ maximum		
Minimum Applicable Load [2]	24V DC, 5 mA (reference value)	1V DC, 1 mA	1V DC, 0.1 mA
Operating Time [3]	20 ms maximum		
Release Time [3]	20 ms maximum		
Power Consumption	AC: 1.1 to 1.4VA (50 Hz), 0.9 to 1.2VA (60 Hz) DC: 0.9 to 1.0W		
Insulation Resistance	100MΩ minimum (500V DC megger)		
Dielectric Strength	Between contact and coil: 2500V AC, 1 minute		
	Between contacts of different poles:		
	2500V AC, 1 minute	2000V AC, 1 minute	
	Between contacts of the same pole: 1000V AC, 1 minute		
Operating Frequency	Electrical: 1800 operations/h maximum Mechanical: 18,000 operations/h maximum		
Vibration Resistance	Damage limits: 10 to 55 Hz, amplitude 0.5 mm Operating extremes: 10 to 55 Hz, amplitude 0.5 mm		
Shock Resistance	Damage limits: 1000 m/s^2 (100G) Operating extremes: 150 m/s^2 (15G)		
Mechanical Life	AC: 50,000,000 operations DC: 100,000,000 operations		50,000,000 operations
Electrical Life [4]	See table on page 794		
Operating Temperature [5]	PCB model: –55 to +70°C (no freezing) Blade model: –55 to +60°C (no freezing)		
Operating Humidity	5 to 85% RH (no condensation)		
Weight	Approx. 35g		

1. Measured using 5V DC, 1A voltage drop method
2. Measured at operating frequency of 120 operations/min (failure rate level P, reference value)
3. Measured at the rated voltage (at 20°C), excluding contact bouncing;
   Release time of AC relays with RC: 25 ms maximum
   Release time of DC relays with diode: 40 ms maximum
4. Contact Load and Electrical Life (at ambient temperature 20°C)
5. Measured at the rated voltage.

Accessories

Item	Appearance	Use with	Part No.	Remarks
Aluminum DIN Rail (1 meter length)		All DIN rail sockets	BNDN1000	The BNDN1000 is designed to accommodate DIN mount sockets. Made of durable extruded aluminum, the BNDN1000 measures 0.413 (10.5mm) in height and 1.37 (35mm) in width (DIN standard). Standard length is 39" (1,000mm).
DIN Rail End Stop		DIN rail	BNL5	9.1 mm wide.
Replacement Hold-Down Spring Anchor		Horseshoe clip for DIN rail sockets	Y778-011	For use on DIN rail mount socket when using pullover wire hold down spring. 2 pieces included with each socket.

Coil Ratings

Rated Voltage (V)		Coil Voltage Code	Rated Current (mA) ±15% (at 20°C)		Coil Resistance (Ω) ±10% (at 20°C)	Operating Characteristics (values at 20°C)		
			50 Hz	60 Hz		Maximum Continuous Applied Voltage	Pickup Voltage	Dropout Voltage
AC (50/60 Hz)	24	A24	49.3	42.5	164	110%	80% maximum	30% minimum
	110-120	A110	8.4-10.0	7.1-8.2	4,550			
	220-240	A220	4.2-5.0	3.6-4.2	18,230			
DC	6	D6	155		40	110%	80% maximum	10% minimum
	12	D12	80		160			
	24	D24	44.7		605			
	48	D48	18		2,560			
	110	D110	8.9		12,100			

1. The rated current includes the current of the LED indicator.

Surge Suppressor Ratings

Model		Ratings
AC Coil	With RC	RC series circuit R: 20 kΩ, C: 0.033 µF
DC Coil	With Diode	Diode reverse voltage: 1000V Diode forward current: 1A

Contact Ratings

Maximum Contact Capacity						
Contact	Continuous Current	Allowable Contact Power		Voltage (V)	Rated Load	
		Resistive Load	Inductive Load		Res. Load	Ind. Load
DPDT	10A	2500VA AC	1250VA AC	250 AC	10A	5A
		300W DC	150W DC	30 DC	10A	5A
4PDT	6A	1500VA AC	600VA AC	250 AC	6A	0.8A
		180W DC	90W DC	30 DC	6A	1.5A
4PDT bifurcated	3A	750VA AC	200VA AC	250 AC	3A	0.8A
		90W DC	45W DC	30 DC	3A	1.5A

1. On 4PDT relays, the maximum allowable total current of neighboring two poles is 6A. At the rated load, make sure that the total current of neighboring two poles does not exceed 6A (3A + 3A = 6A).
2. Inductive load for the rated load — cos ø = 0.3, L/R = 7 ms

UL and c-UL Ratings

Voltage	Resistive			General Use			Horse Power Rating		
	RU2	RU4	RU42	RU2	RU4	RU42	RU2	RU4	RU42
250V AC	10A	—	3A	—	6A	—	—	1/10HP	—
30V DC	10A	6A	3A	—	—	—	—	—	—

CSA Ratings

Voltage	Resistive
	RU42
250V AC	3A
30V DC	3A

TÜV Ratings

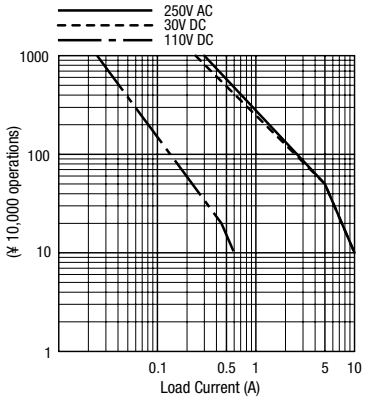
Voltage	Resistive			Inductive		
	RU2	RU4	RU42	RU2	RU4	RU42
250V AC	10A	6A	3A	5A	0.8A	0.8A
30V DC	10A	6A	3A	5A	1.5A	1.5A

Socket Specifications

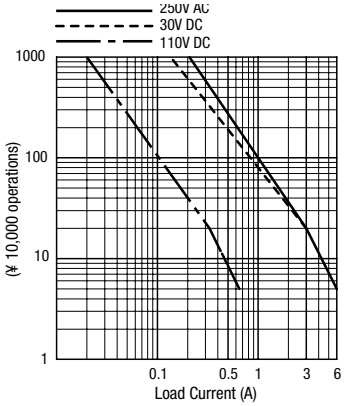
	Sockets	Terminal	Electrical Rating	Wire Size	Torque
DIN Rail Mount Sockets	SU2S-11L	Spring clamp terminals	250V/10A	24-16 AWG	—
	SU4S-11L	Spring clamp terminals	250V/6A (using RU4), 10A (using RU2)	24-16 AWG	—
	SM2S-05	M3 screw with captive wire clamp	300V, 10A	Maximum up to 2–#14AWG	5.5 - 9in•lbs
	SM2S-05C	M3 screw with captive wire clamp, fingersafe	300V, 10A	Maximum up to 2–#14AWG	5.5 - 9in•lbs
	SY4S-05	M3 screw with captive wire clamp	300V, 7A (using RU4), 10A (using RU2)	Maximum up to 2–#14AWG	5.5 - 9in•lbs
	SY4S-05C	M3 screw with captive wire clamp, fingersafe	300V, 7A (using RU4), 10A (using RU2)	Maximum up to 2–#14AWG	5.5 - 9in•lbs
Through Panel Mount Socket	SY4S-51	Solder	300V, 7A	—	—
PCB Mount Socket	SY4S-61	PCB mount	300V, 7A	—	—
	SY4S-62	PCB mount	250V, 7A	—	—

Electrical Life Curves

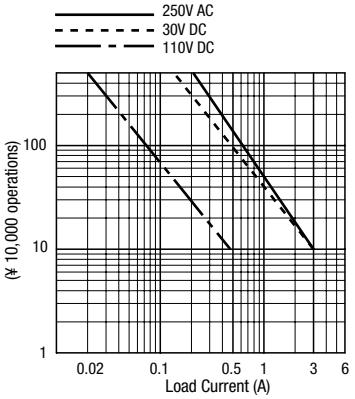
RU2 (Resistive Load)



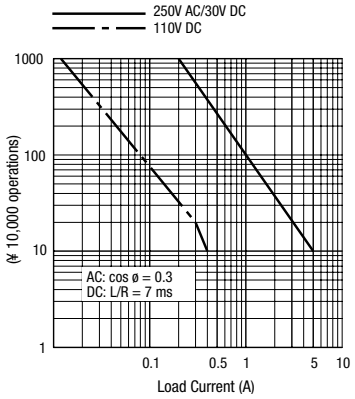
RU4 (Resistive Load)



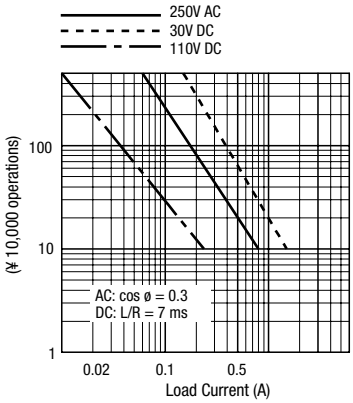
RU42 (Resistive Load)



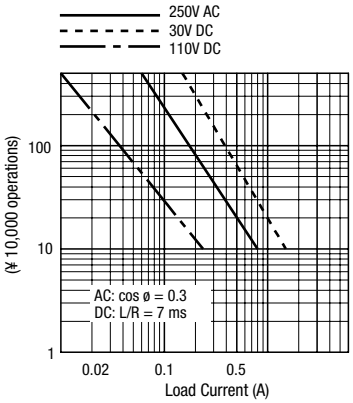
RU2 (Inductive Load)



RU4 (Inductive Load)

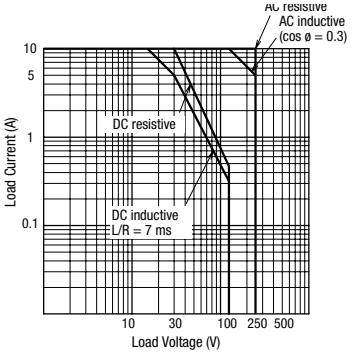


RU42 (Inductive Load)

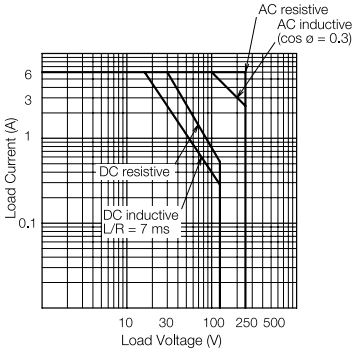


Maximum Switching Current

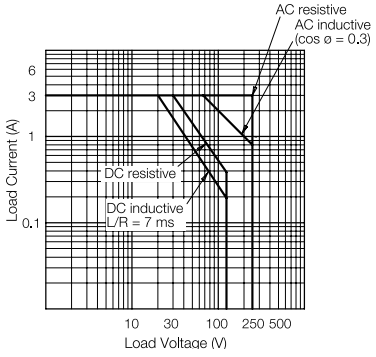
RU2



RU4

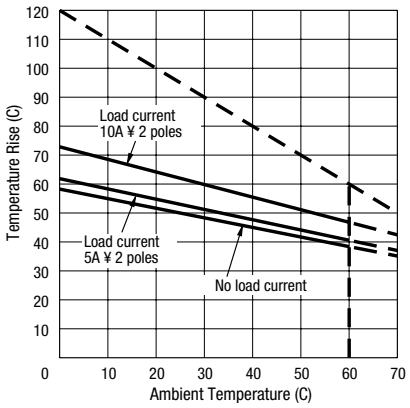


RU42 (Bifurcated)

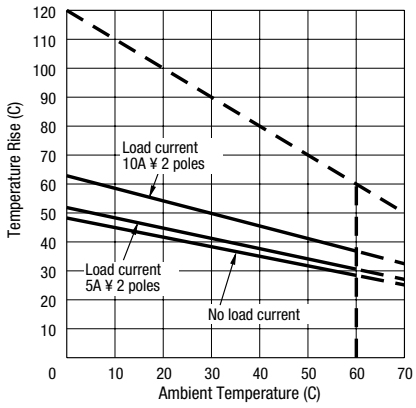


Ambient Temperature vs. Temperature Rise Curves

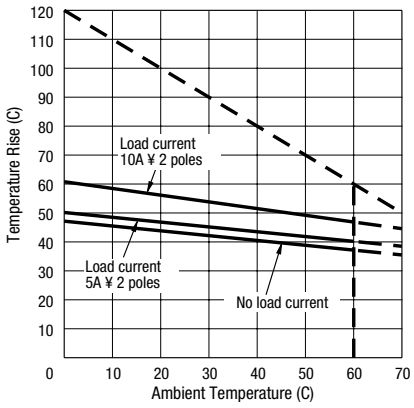
RU2 (AC Coil, 50 Hz)



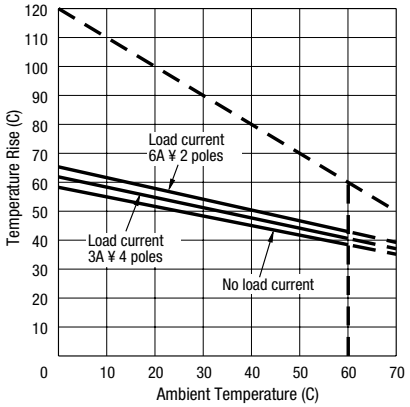
RU2 (AC Coil, 60 Hz)



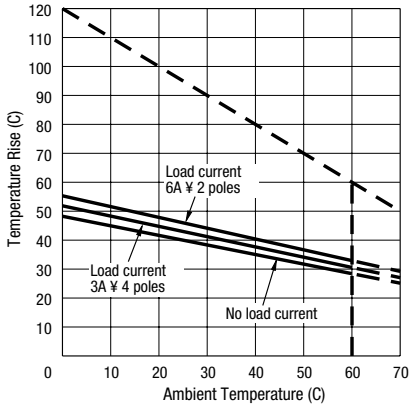
RU2 (DC Coil)



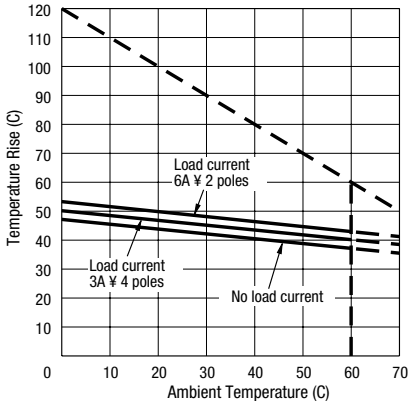
RU4/RU42 (AC Coil, 50 Hz)



RU4/RU42 (AC Coil, 60 Hz)



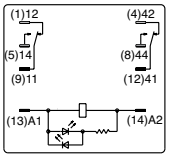
RU4/RU42 (DC Coil)



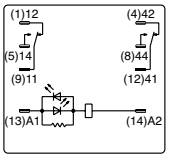
The above temperature rise curves show the characteristics when 100% the rated coil voltage is applied.
The heat resistance of the coil is 120°C. The slant dashed line indicates the allowable temperature rise for the coil at different ambient temperatures.
Load current 6A x 2 poles is for the RU4 models only.

Internal Connection (View from Bottom)

RU2S-* Standard

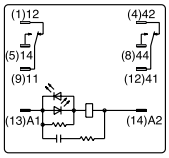


24V AC/DC coil or less

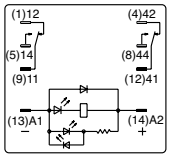


Over 24V AC/DC coil

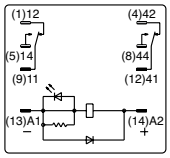
RU2S-*R with RC



RU2S-*D With Diode

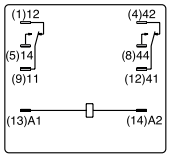


24V DC coil or less

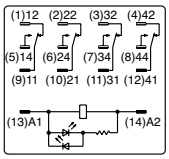


Over 24V DC coil

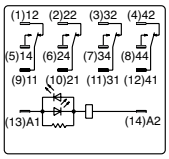
RU2V-NF-*



RU4S-*/RU42S-* Standard

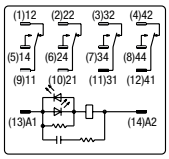


24V AC/DC coil or less

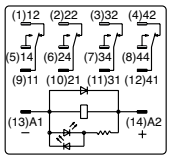


Over 24V AC/DC coil

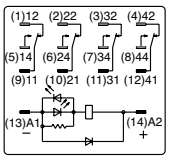
RU4S-*R/RU42S-*R With RC



RU4S-*D/RU42S-*D With Diode

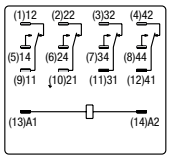


24V DC coil or less



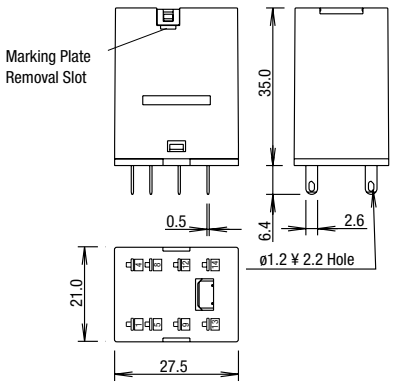
Over 24V DC coil

RU4V-NF-*/RU42V-NF-*



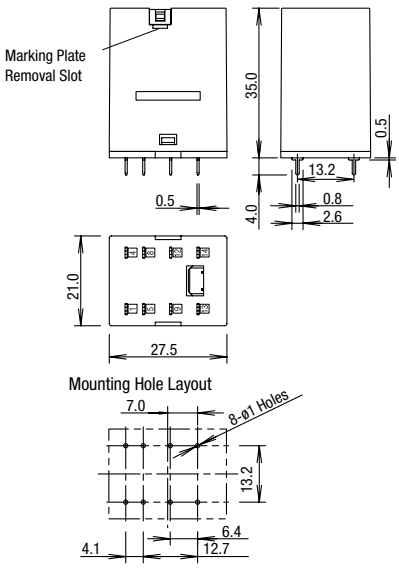
Dimensions (mm)

RU2S



Marking plate removal slot is provided only on one side. Insert a flat screwdriver into the slot to remove the marking plate.

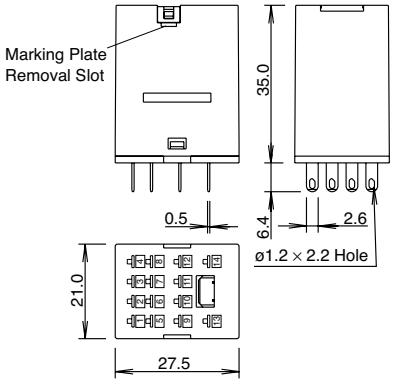
RU2V



All dimensions in mm.

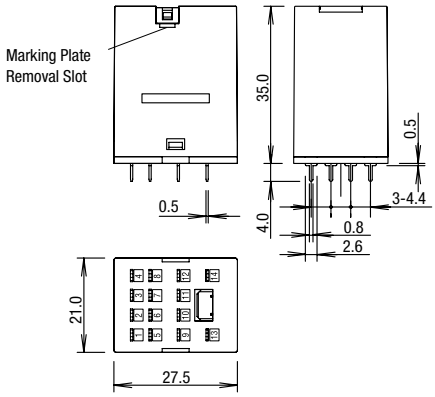
Dimensions con't (mm)

RU4S/RU42S

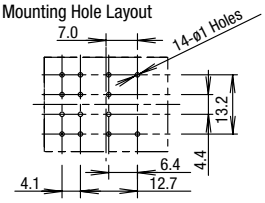


Marking plate removal slot is provided only on one side. Insert a flat screwdriver into the slot to remove the marking plate.

RU4V/RU42V



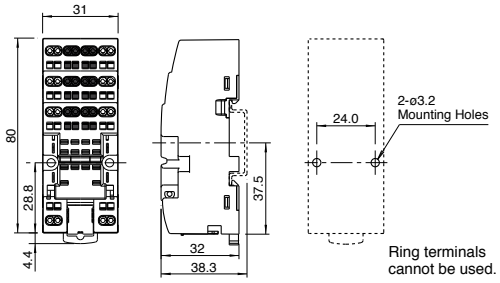
Mounting Hole Layout



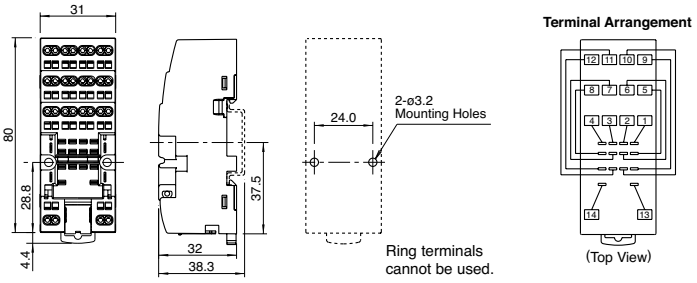
All dimensions in mm.

Spring Clamp DIN Rail Mount Sockets

SU2S-11L

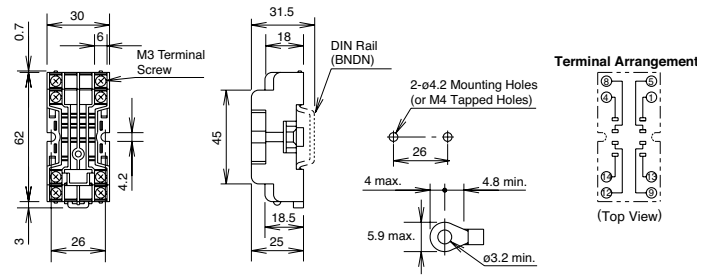


SU4S-11L

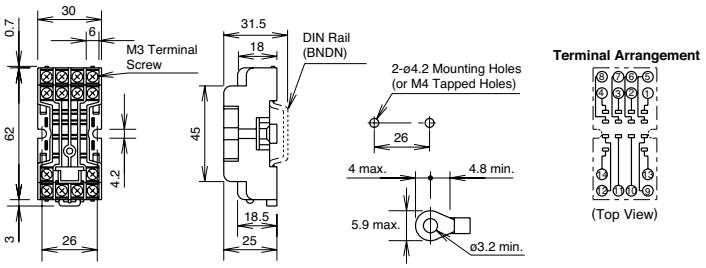


Standard DIN Rail Mount Sockets

SM2S-05



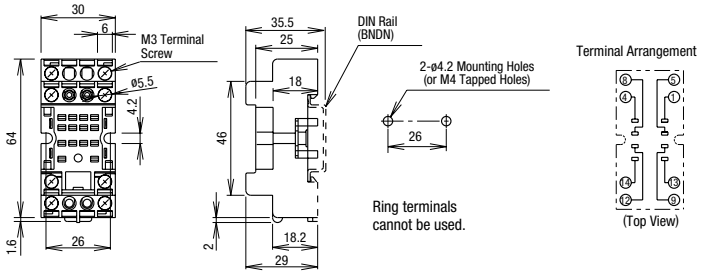
SY4S-05



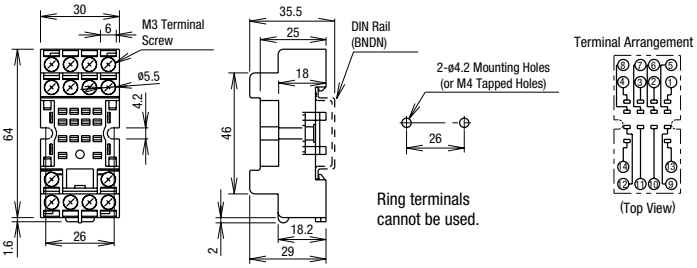
Dimensions con't (mm)

Finger-safe DIN Rail Mount Sockets

SM2S-05C

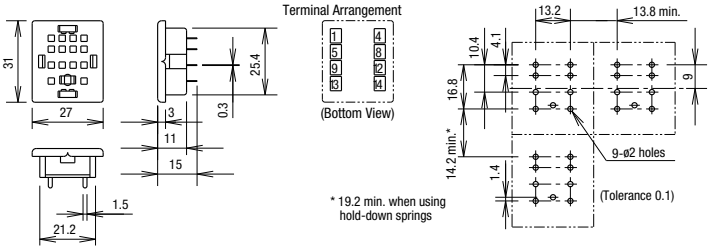


SY4S-05C

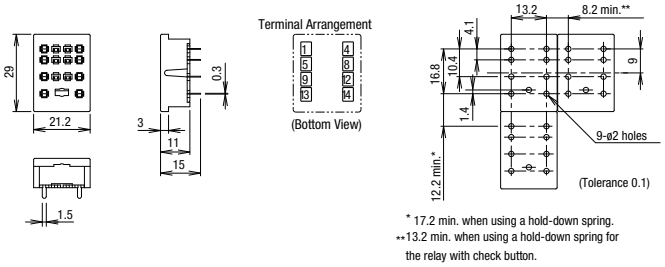


PCB Mount Sockets

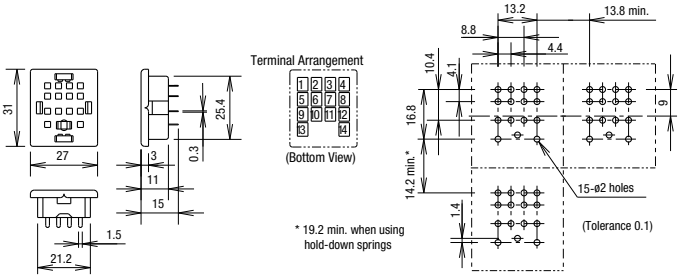
SM2S-61



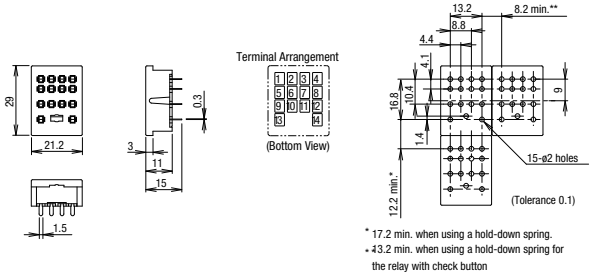
SM2S-62



SY4S-61

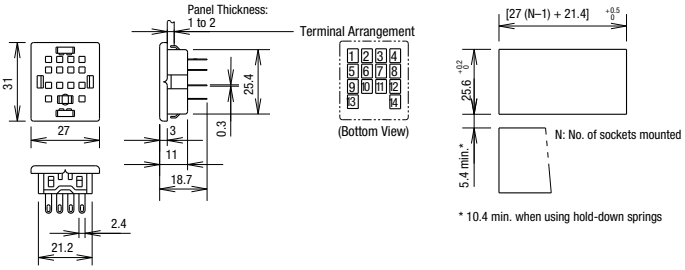


SY4S-62



Through Panel Mount Socket

SY4S-51

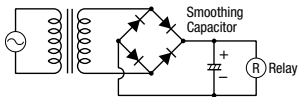


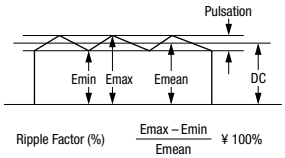
Operating Instructions

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.



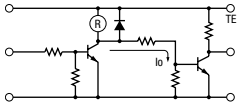


$$\text{Ripple Factor (\%)} = \frac{\text{Emax} - \text{Emin}}{\text{Emean}} \times 100\%$$

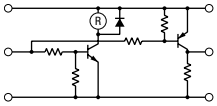
Emax = Maximum of pulsating current
Emin = Minimum of pulsating current
Emean = DC mean value

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.

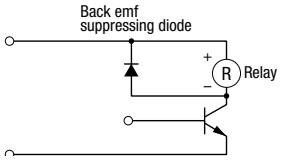
Incorrect



Correct



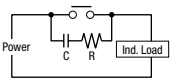
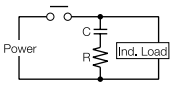
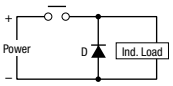
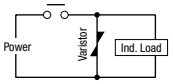
4. Surge suppression for transistor driving circuits:
   When the relay coil is turned off, a high-voltage pulse is generated, causing a transistor to deteriorate and sometimes to break. Be sure to connect a diode to suppress the back electromotive force. Then, the coil release time becomes slightly 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.



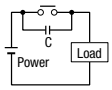
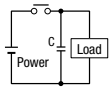
Protection for Relay Contacts

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.

RV8H Series	RJ Series	RQ Series	RH Series	RR Series
				
756	759	769	773	783
1 form C (SPDT)	SPDT, SPST, DPDT, DPST	SPDT, DPDT	SPDT, DPDT, 3PDT, 4PDT	SPDT, DPDT, 3PDT
Screw	Blade or PCB	PCB	Blade or PCB	Pin or Blade
6A 30VDC/250VAC	SPDT: 12A/16A, 30V DC/250V AC DPDT: 8A, 30V DC/250V AC	SPDT: 12A, 16A DPDT: 8A	10A, 30V DC/240V AC 1/3HP, 240V AC 1/6HP, 120V AC	10A, 30V DC/ 240V AC 1/3HP, 240V AC 1/4HP, 120V AC
Silver-Nickel with gold plating	Silver-Nickel alloy	Silver-Nickel alloy	Silver-Cadmium Oxide	Silver

RU Series	RY/RM Series		RF1V Series