

RU series Universal Relays

Full featured universal miniature relays

Designed with environment taken into consideration

- Two terminal styles: plug-in and PCB mount
- Non-polarized LED indicator available on plug-in relays
- No internal wires, lead-free construction
- Cadmium-free contacts
- Mechanical flag indicator available on plug-in relays
- 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, CSA, c-UL, EN compliant

Standard	Mark	Approval Organization / File No.
UL508 CSA C22.2 No. 14		UL/c-UL File No. E66043
CSA C22.2 No. 14		CSA File No. LR35144 (CSA mark is printed on bifurcated contact types only)
EN61810-1		TÜV Product Service
		Self declaration (EC Low Voltage Directive)



With Latching Lever

Mechanical Indicator

The contact position can be confirmed through the file small windows.

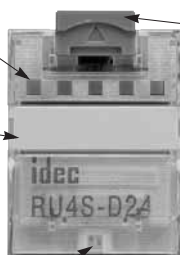
Marking Plate

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

Lever in the Latched Position



Latching Lever

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

AC coil: Orange
DC coil: Green

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.

Without Latching Lever

AC/DC Color Marking

For identification of AC or DC coils.

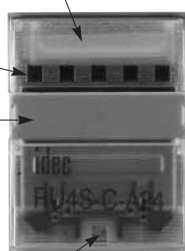
AC coil: Yellow
DC coil: Blue

Mechanical Indicator

Marking Plate

LED Indicator

Non-polarized green LED indicator is standard provision for plug-in terminal types, except for simple types.



AC Coil



DC Coil

Relay Coil Tape Colors

Coil Rated 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	

RU Series Universal Relays

Types

• Single Contact Type

Termination	Latching Lever	Type	Type No.		Coil Voltage Code *
			DPDT	4PDT	
Plug-in Terminal (Note 1)	With Latching Lever	Standard	RU2S-*	RU4S-*	A24, A100, A110, A200, A220 D6, D12, D24, D48, D110
		With RC (AC coil only)	RU2S-R-*	RU4S-R-*	A100, A110, A200, A220
		With diode (DC coil only)	RU2S-D-*	RU4S-D-*	D6, D12, D24, D48, D110
		With diode (DC coil only) Reverse polarity coil	RU2S-D1-*	RU4S-D1-*	D24
	Without Latching Lever	Standard	RU2S-C-*	RU4S-C-*	A24, A100, A110, A200, A220 D6, D12, D24, D48, D110
		With RC (AC coil only)	RU2S-CR-*	RU4S-CR-*	A100, A110, A200, A220
		With diode (DC coil only)	RU2S-CD-*	RU4S-CD-*	D6, D12, D24, D48, D110
		With diode (DC coil only) Reverse polarity coil	RU2S-CD1-*	RU4S-CD1-*	D24
		Simple (Note 2)	RU2S-NF-*	RU4S-NF-*	A24, A100, A110, A200, A220 D6, D12, D24, D48, D110
PCB Terminal	Without Latching Lever	Simple (Note 2)	RU2V-NF-*	RU4V-NF-*	

• Bifurcated Contact Type

Termination	Latching Lever	Type	Type No. 4PDT	Coil Voltage Code *
Plug-in Terminal (Note 1)	With Latching Lever	Standard	RU42S-*	A24, A100, A110, A200, A220 D6, D12, D24, D48, D100, D110
		With RC (AC coil only)	RU42S-R-*	A100, A110, A200, A220
		With diode (DC coil only)	RU42S-D-*	D6, D12, D24, D48, D100, D110
		With diode (DC coil only) Reverse polarity coil	RU42S-D1-*	D24
	Without Latching Lever	Standard	RU42S-C-*	A24, A100, A110, A200, A220 D6, D12, D24, D48, D100, D110
		With RC (AC coil only)	RU42S-CR-*	A100, A110, A200, A220
		With diode (DC coil only)	RU42S-CD-*	D6, D12, D24, D48, D100, D110
		With diode (DC coil only) Reverse polarity coil	RU42S-CD1-*	D24
		Simple (Note 2)	RU42S-NF-*	A24, A100, A110, A200, A220 D6, D12, D24, D48, D100, D110
PCB Terminal	Without Latching Lever	Simple (Note 2)	RU42V-NF-*	

Note 1: Plug-in terminal types, except for simple types, have an LED indicator and a mechanical indicator as standard.

Note 2: Simple types do not have an LED indicator, a mechanical indicator, and a latching lever.

Ordering Information

Specify a coil voltage code in place of * in the Type No.

Coil Voltage Code *	Coil Rating
A24	24V AC
A100	100-110V AC
A110	110-120V AC
A200	200-220V AC
A220	220-240V AC
D6	6V DC
D12	12V DC
D24	24V DC
D48	48V DC
D100	100V DC
D110	110V DC

Accessory

Name	Type No.	Ordering Type No.	Color Code *	Package Quantity
Marking Plate	RU9Z-P*	RU9Z-P*PN10	A (orange), G (green), S (blue), W (white), Y (yellow)	10

Note: Specify a color code in place of the Type No. When ordering, specify the Ordering Type No.

The marking plate can be removed from the relay by inserting a flat screwdriver under the marking plate.

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Coil Ratings

Rated Voltage (V)		Coil Voltage Code	Rated Current (mA) ±15% (at 20°C)		Coil Resistance (Ω) ±10% (at 20°C)	Operating Characteristics (against rated values at 20°C)		
			50 Hz	60 Hz		Maximum Continuous Applied Voltage	Minimum Pickup Voltage	Dropout Voltage
AC (50/60 Hz)	24	A24	49.3	42.5	164	110%	80% maximum	30% minimum
	100-110	A100	9.2-11.0	7.8-9.0	3,460			
	110-120	A110	8.4-10.0	7.1-8.2	4,550			
	200-220	A200	4.6-5.5	4.0-4.6	14,080			
	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			
	100	D100	9.7		10,000			
	110	D110	8.9		12,100			

Note 1: The rated current includes the current draw by the LED indicator.

Note 2: Rated voltage 100V DC is available for the bifurcated contact type only.

Contact Ratings

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

Note 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).

Note 2: Inductive load for the rated load — $\cos \phi = 0.3$, $L/R = 7$ 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

Surge Suppressor Ratings

Type	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

Specifications

Type (Contact)	RU2 (DPDT)	RU4 (4PDT)	RU42 (4PDT)
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
Operate 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	100 MΩ 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		
Operating Frequency	Between contacts of the same pole: 1000V AC, 1 minute		
	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 Operating extremes: 150 m/s ²		
Mechanical Life	AC: 50,000,000 operations DC: 100,000,000 operations		50,000,000 operations
Electrical Life *4	See table below		
Operating Temperature *5	Simple types: -55 to +70°C (no freezing) Others: -55 to +60°C (no freezing)		
Operating Humidity	5 to 85% RH (no condensation)		
Weight	Approx. 35g		

Note: Above values are initial values.

*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)

Type	Voltage	Resistive Load	Inductive Load ($\cos \phi = 0.3$, $L/R = 7$ ms)	Electrical Life (operations minimum)
RU2	250V AC	10A	5A	100,000
		5A	2.5A	500,000
	30V DC	10A	5A	100,000
		5A	2.5A	500,000
RU4	110V DC	0.6A	0.4A	100,000
		6	2.6A	50,000
	250V AC	3A	0.8A	200,000
		6A	2.7A	50,000
	30V DC	3A	1.5A	200,000
		0.65A	0.33A	50,000
	110V DC	0.33A	0.18A	200,000
		3A	0.8A	100,000
RU42	250V AC	3A	1.5A	100,000
	30V DC	3A	1.5A	100,000
	110V DC	0.44A	0.22A	100,000

*5: Measured at the rated voltage. Simple types include plug-in terminal simple types and all PCB terminal types.

RU2 (DPDT Contact)

• Plug-in Terminal Type



- LED indicator, mechanical flag indicator, and marking plate are standard provisions, except on simple types.
- Available with or without a manual latching lever
- Simple types have a marking plate.



Photo: RU2S-A100

• PCB Terminal Type



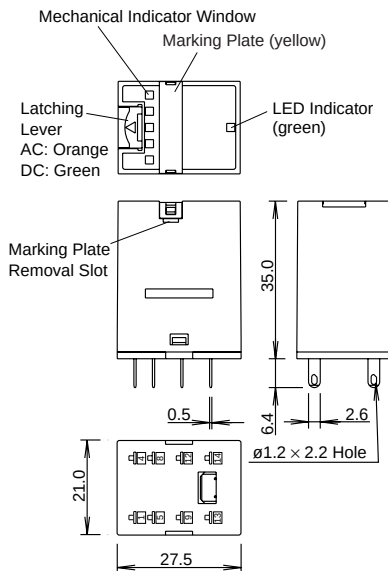
- Marking plate is a standard provision.
- Not provided with an LED indicator, mechanical flag indicator, and manual latching lever.



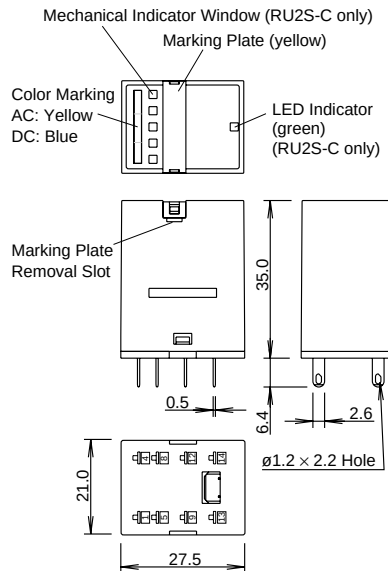
Photo: RU2V-NF-A100

Dimensions

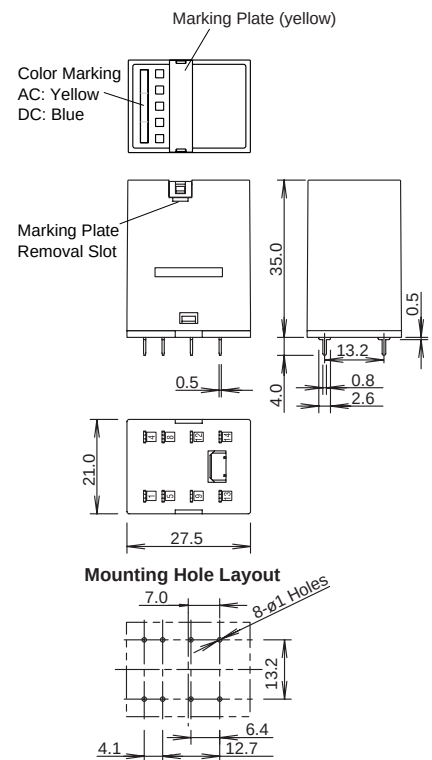
• RU2S



• RU2S-C/RU2S-NF



• RU2V

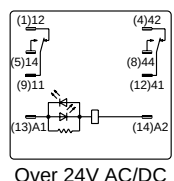
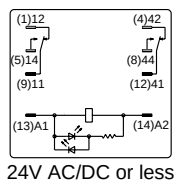


Marking plate removal slot is provided only on one side.
Insert a flat screwdriver into the slot to remove the marking plate.

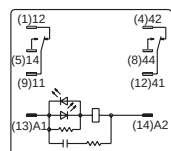
All dimensions in mm.

Internal Connection (Bottom View)

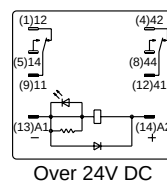
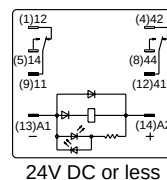
• RU2S-* Standard



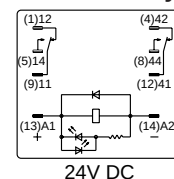
• RU2S-*R With RC



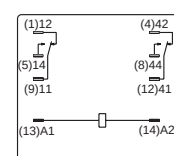
• RU2S-*D With Diode



• RU2S-*D1 With Diode Reverse Polarity Coil



• RU2S-NF-*/RU2V-NF-*

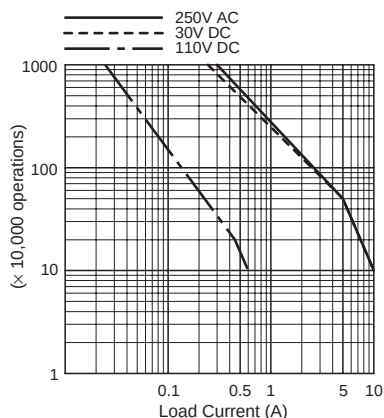


Blank or C comes in place of * to represent types with or without a latching lever.

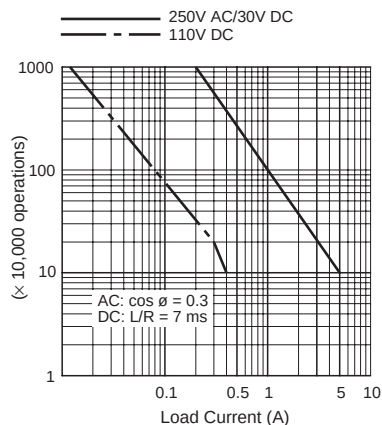
RU Series Universal Relays

Electrical Life Curves

•RU2 (Resistive Load)

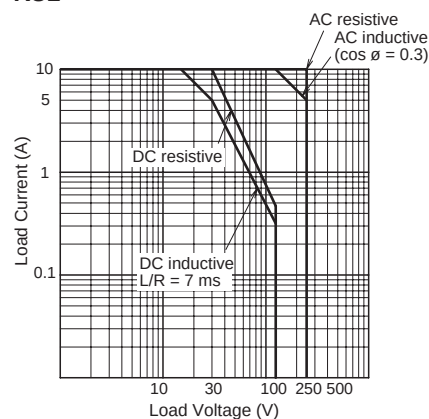


•RU2 (Inductive Load)



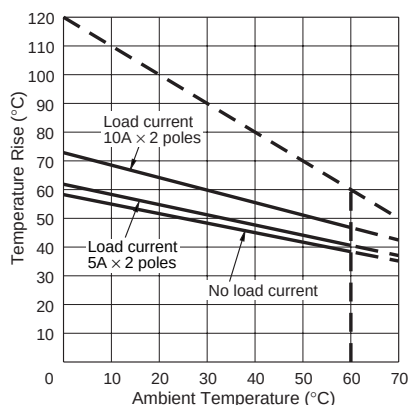
Maximum Switching Current

•RU2

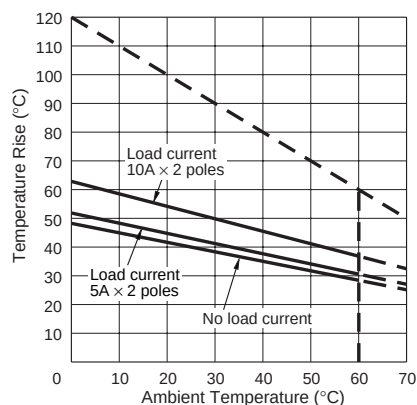


Ambient Temperature vs. Temperature Rise Curves

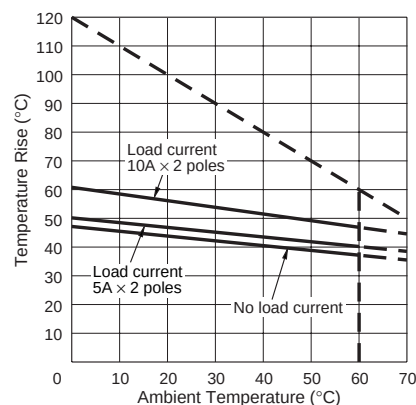
•RU2 (AC Coil, 50 Hz)



•RU2 (AC Coil, 60 Hz)



•RU2 (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.

RU4 (4PDT Contact)

• Plug-in Terminal Type



- LED indicator, mechanical flag indicator, and marking plate are standard provisions, except on simple types.
- Available with or without a manual latching lever
- Simple types have a marking plate.



Photo: RU42S-A100

• PCB Terminal Type



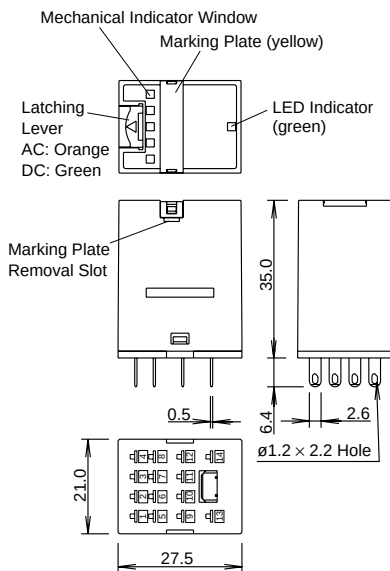
- Marking plate is a standard provision.
- Not provided with an LED indicator, mechanical flag indicator, and manual latching lever.



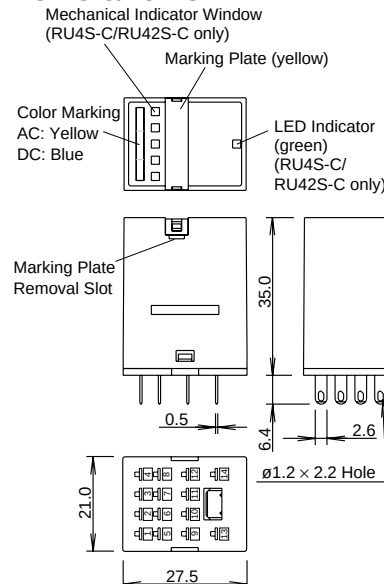
Photo: RU4V-NF-D24

Dimensions

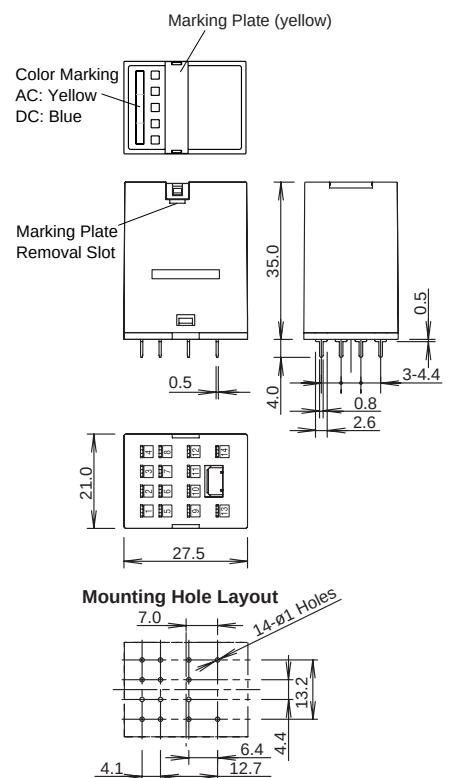
• RU4S/RU42S



• RU4S-C/RU4S-NF RU42S-C/RU42S-NF



• RU4V/RU42V



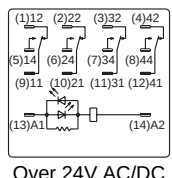
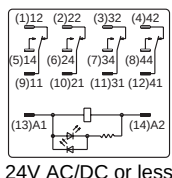
Marking plate removal slot is provided only on one side.
Insert a flat screwdriver into the slot to remove the marking plate.

All dimensions in mm.

Internal Connection (Bottom View)

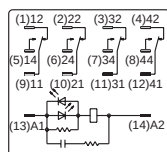
• RU4S-*/RU42S-*

Standard



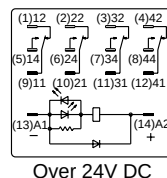
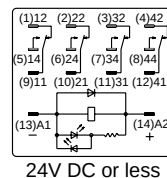
• RU4S-*R/RU42S-*R

With RC



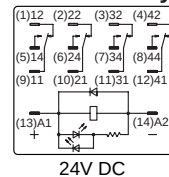
• RU4S-*D/RU42S-*D

With Diode



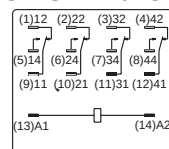
• RU4S-*D1/RU42S-*D1

With Diode
Reverse Polarity Coil



• RU4S-NF-*/RU4V-NF-*

RU42S-NF-*/RU42V-NF-*

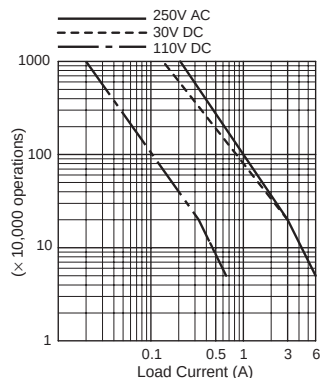


Blank or C comes in place of * to represent types with or without a latching lever.

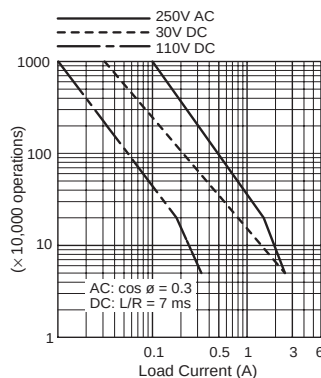
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Electrical Life Curves

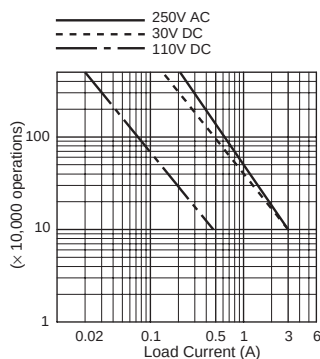
• RU4 (Resistive Load)



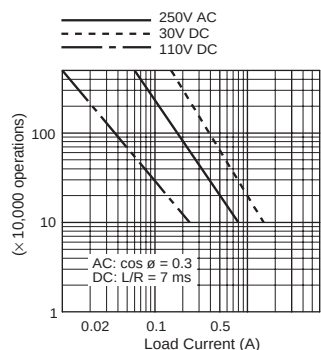
• RU4 (Inductive Load)



• RU42 (Resistive Load)

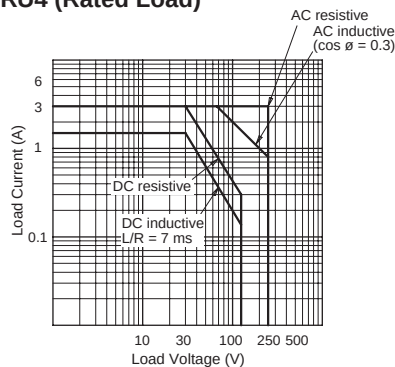


• RU42 (Inductive Load)

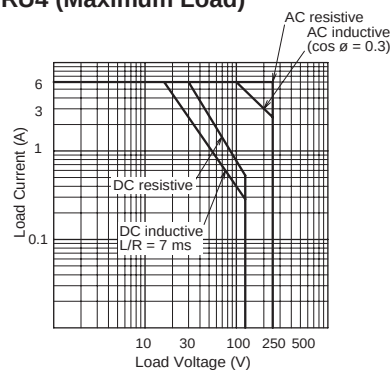


Maximum Switching Current

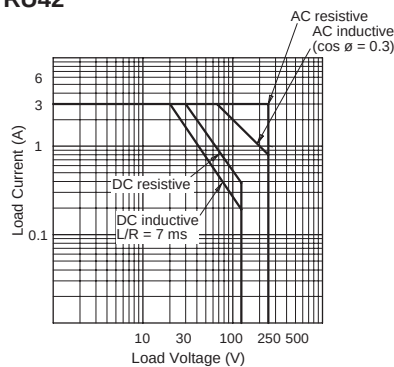
• RU4 (Rated Load)



• RU4 (Maximum Load)

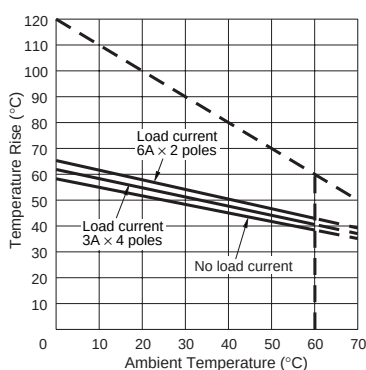


• RU42

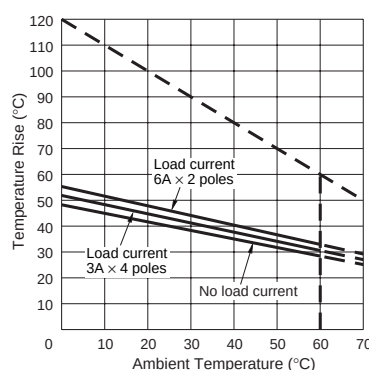


Ambient Temperature vs. Temperature Rise Curves

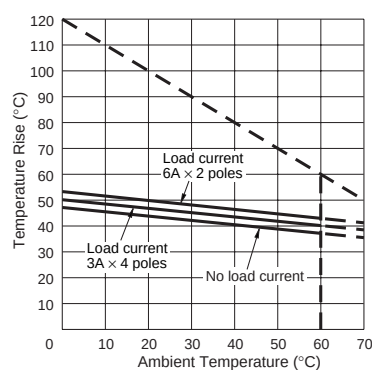
• RU4/RU42 (AC Coil, 50 Hz)



• 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.

Load current 6A x 2 poles is for the RU4 types only.

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.