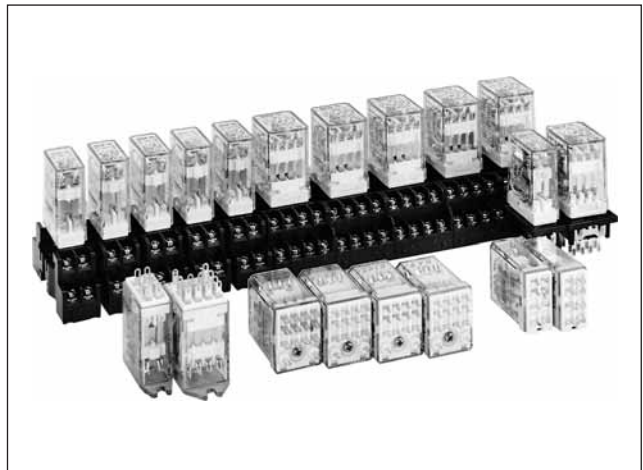


# RY Series Miniature Relays

## DPDT (3A) and 4PDT (5A) contacts Bifurcated contacts are also available

The RY series are general purpose miniature relays with a 3A or 5A contact capacity. A wide variety of terminals styles and coil voltages meet a wide range of applications. All 4PDT types have arc barriers.



## Types

### • Plug-in Terminal Type

Contact	Type	DPDT		4PDT	
		Type No.	Coil Voltage Code *	Type No.	Coil Voltage Code *
Standard	Basic	RY2S-U* ★	AC6, AC12, AC24, AC50, AC100, AC110, AC115, AC120, AC200, AC220, AC230, AC240	RY4S-U* ★	AC6, AC12, AC24, AC50, AC100-110, AC110-120, AC200-220, AC220-240
	With Indicator	RY2S-UL* ★		RY4S-UL* ★	
	With Check Button	—		RY4S-UC* ★	
	With Indicator and Check Button	—		RY4S-ULC* ★	
	Top Bracket Mounting	RY2S-UT* ★	DC6, DC12, D24, DC48, DC100, DC110	RY4S-UT* ★	DC6, DC12, DC24, DC48, DC100-110
	With Diode (DC coil only)	RY2S-UD* ★	DC6, DC12, DC24, DC48, DC100, DC110	RY4S-UD* ★	DC6, DC12, DC24, DC48, DC100-110
	With Indicator and Diode (DC coil only)	—	—	RY4S-ULD* ★	
Bifurcated	Basic	RY22S-U* ★	AC6, AC12, AC24, AC50, AC100, AC110, AC115, AC120, AC200, AC220, AC230, AC240	—	—
	With Indicator	RY22S-UL* ★		—	
	Top Bracket Mounting	RY22S-UT* ★	DC6, DC12, DC24, DC48, DC100, DC110	—	—
	With Diode (DC coil only)	RY22S-UD* ★	DC6, DC12, DC24, DC48, DC100, DC110	—	—

### • PC Board Terminal Type

Contact	Type	DPDT		4PDT	
		Type No.	Coil Voltage Code *	Type No.	Coil Voltage Code *
Standard	Standard	RY2V-U* ★	AC6, AC12, AC24, AC50, AC100, AC110, AC115, AC120, AC200, AC220, AC230, AC240	RY4V-U* ★	AC6, AC12, AC24, AC50, AC100-110, AC110-120, AC200-220, AC220-240
	With Indicator	RY2V-UL* ★		RY4V-UL* ★	
	With Diode (DC coil only)	RY2V-UD* ★	DC6, DC12, DC24, DC48, DC100, DC110	—	—
Bifurcated	Standard	RY22V-U* ★	AC6, AC12, AC24, AC50, AC100, AC110, AC115, AC120, AC200, AC220, AC230, AC240	—	—
	With Indicator	RY22V-UL* ★		—	
	With Diode (DC coil only)	RY22V-UD* ★	DC6, DC12, DC24, DC48, DC100, DC110	—	—

Type numbers marked with ★ in the tables above are UL-recognized, CSA-certified, and TÜV-approved.

## Ordering Information

When ordering, specify the Type No. and coil voltage code.

(Example) **RY4S-U** **AC100-110**  
 Type No.                      Coil Voltage Code

# RY Series Miniature Relays

## Coil Ratings

	Rated Voltage (V)		Rated Current (mA) ±15% at 20°C				Coil Resistance (Ω) ±10% at 20°C		Operation Characteristics (against rated values at 20°C)		
	DPDT	4PDT	50Hz		60Hz		DPDT	4PDT	Max. Continuous Applied Voltage	Min. Pickup Voltage	Dropout Voltage
AC (50/60Hz)	6	6	170	240	150	200	18.8	9.4	110%	80% maximum	30% minimum
	12	12	86	121	75	100	76.8	39.3			
	24	24	42	60.5	37	50	300	153			
	50	50	20.5	28.9	18	24	1,280	680			
	100	100-110	10.5	10.3-11.8	9	9.1-10.0	5,220	3,360			
	110	—	9.6	—	8.4	—	6,950	—			
	115	110-120	8.9	9.4-10.8	7.8	8.0-9.2	7,210	4,290			
	120	—	8.6	—	7.5	—	8,100	—			
	200	200-220	5.6	5.1-5.9	4.9	4.3-5.0	21,442	13,690			
	220	—	4.7	—	4.1	—	25,892	—			
230	220-240	4.7	4.7-5.4	4.1	4.0-4.6	26,710	18,820				
240	—	4.9	—	4.3	—	26,710	—				
DC	DPDT	4PDT	DPDT		4PDT		DPDT	4PDT	110%	80% maximum	10% minimum
	6	6	128		150		47	40			
	12	12	64		75		188	160			
	24	24	32		36.9		750	650			
	48	48	18		18.5		2,660	2,600			
	100	100-110	10		8.2-9.0		10,000	12,250			
	110	—	8		—		13,800	—			

## Contact Ratings

Maximum Contact Capacity						
Contact	Continuous Current	Allowable Contact Power		Rated Load		
		Resistive Load	Inductive Load	Voltage	Resistive Load	Inductive Load
Standard Contact DPDT	3A	660 VA AC 90W DC	176 VA AC 45W DC	110V AC	3A	1.5A
				220V AC	3A	0.8A
				30V DC	3A	1.5A
Standard Contact 4PDT	5A	1200 VA AC 150W DC	288 VA AC 60W DC	240V AC	5A	1.2A
				30V DC	5A	2A
Bifurcated Contact DPDT	1A	176 VA AC 30W DC	88 VA AC 15W DC	110V AC	1A	0.5A
				220V AC	0.8A	0.4A
				30V DC	1A	0.5A

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

### • UL Ratings (Standard Contact)

Voltage	Resistive		General use	
	DPDT	4PDT	DPDT	4PDT
240V AC	3A	5A	0.8A	5A
120V AC	—	—	1.5A	—
100V DC	0.2A	0.2A	0.2A	0.2A
30V DC	3A	5A	3A	5A

### • CSA Ratings (Standard Contact)

Voltage	Resistive		General use	
	DPDT	4PDT	DPDT	4PDT
240V AC	3A	5A	0.8A	5A
120V AC	3A	—	1.5A	—
100V DC	—	—	0.2A	0.2A
30V DC	3A	5A	1.5A	1.5A

### • TÜV Ratings (Standard Contact)

Voltage	DPDT	4PDT
240V AC	3A	5A
30V DC	3A	5A

AC:  $\cos \phi = 1.0$ , DC:  $L/R = 0$  ms

### • UL Ratings (Bifurcated Contact)

Voltage	Resistive	General use
240V AC	0.8A	0.4A
120V AC	1A	0.5A
30V DC	1A	0.5A

### • CSA Ratings (Bifurcated Contact)

Voltage	Resistive	General use
240V AC	0.8A	0.4A
120V AC	1A	0.5A
30V DC	1A	—

# RY Series Miniature Relays

## Specifications

Contact Type	Standard Contact		Bifurcated Contact
	DPDT	4PDT	DPDT
Contact Material	Gold-plated silver		Silver-paradium alloy
Contact Resistance *1	50 mΩ maximum		100 mΩ minimum
Minimum Applicable Load	24V DC, 5 mA; 5V DC, 10 mA (reference value)		1V DC, 100 μA (reference value)
Operate Time *2	20 ms maximum		
Release Time *2	20 ms maximum		
Power Consumption (approx.)	AC: 1.1 VA (50 Hz), 1 VA (60 Hz) DC: 0.8W	AC: 1.4 VA (50 Hz), 1.2 VA (60 Hz) DC: 0.9W	AC: 1.1 VA (50 Hz), 1 VA (60 Hz) DC: 0.8W
Insulation Resistance	100 MΩ minimum (500V DC megger)		
Dielectric Strength	Between live and dead parts: 1500V AC, 1 minute *3 Between contact and coil: 1500V AC, 1 minute Between contacts of different poles: 1500V AC, 1 minute Between contacts of the same pole: 1000V AC, 1 minute	Between live and dead parts: 2000V AC, 1 minute Between contact and coil: 2000V AC, 1 minute Between contacts of different poles: 2000V AC, 1 minute Between contacts of the same pole: 1000V AC, 1 minute	Between live and dead parts: 1500V AC, 1 minute *3 Between contact and coil: 1500V AC, 1 minute Between contacts of different poles: 1500V 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 <sup>2</sup> Operating extremes: 100 m/s <sup>2</sup> (DPDT), 200 m/s <sup>2</sup> (4PDT)		
Mechanical Life	50,000,000 operations		
Electrical Life	200,000 operations (220V AC, 3A)	100,000 operations (220V AC, 5A) 200,000 operations (220V AC, 3A)	200,000 operations (110V AC, 1A)
Operating Temperature *4	-25 to +55°C (no freezing)	-25 to +55°C (no freezing) *5	-25 to +55°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)		
Weight (approx.)	23g	34g	23g

Note: Above values are initial values.

\*1: Measured using 5V DC, 1A voltage drop method

\*2: Measured at the rated voltage (at 20°C), excluding contact bouncing  
Release time of relays with diode: 40 ms maximum

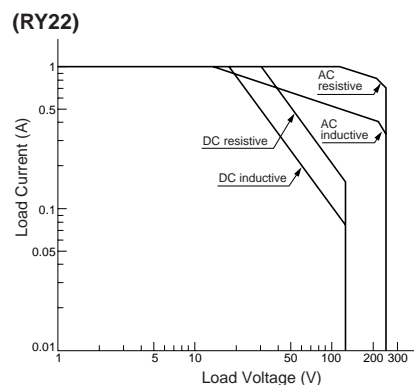
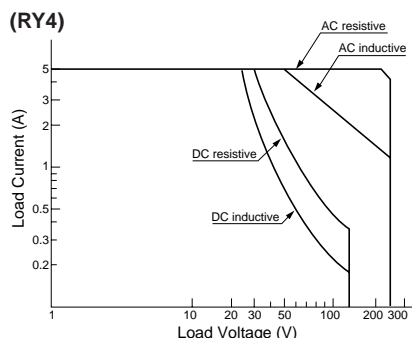
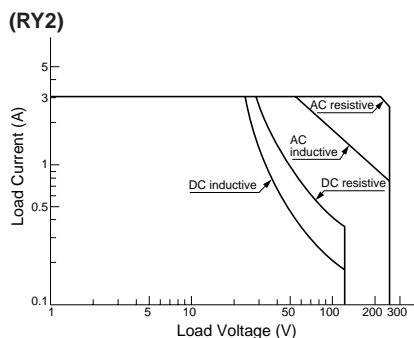
\*3: Relays with indicator or diode: 1000V AC, 1 minute

\*4: For use under different temperature conditions, refer to Continuous Load Current vs. Operating Temperature Curve.  
The operating temperature range of relays with indicator or diode is -25 to +40°C.

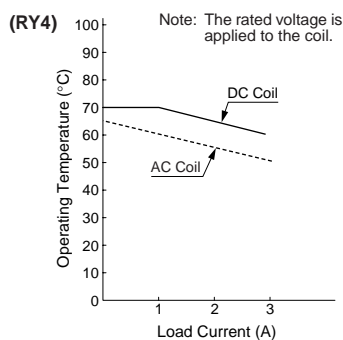
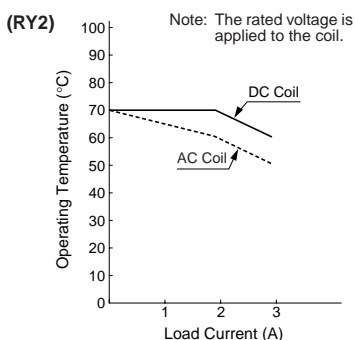
\*5: When the total current of 4 contacts is less than 15A, the operating temperature range is -25 to +70°C.

## Characteristics (Reference Data)

### • Maximum Switching Capacity



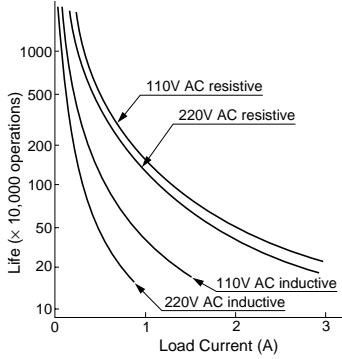
### • Continuous Load Current vs. Operating Temperature Curve (Basic Type, With Check Button, and Top Bracket Mounting Type)



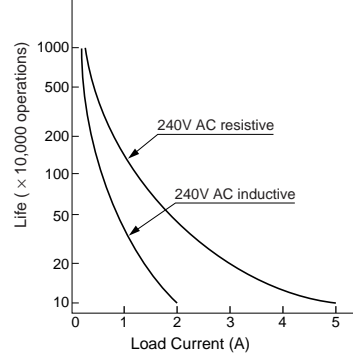
# RY Series Miniature Relays

## • Electrical Life Curve

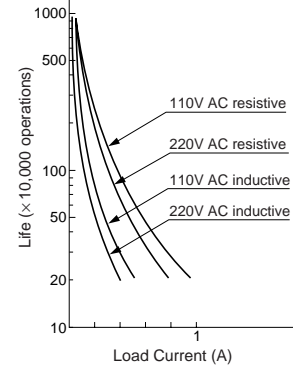
AC Load  
(RY2)



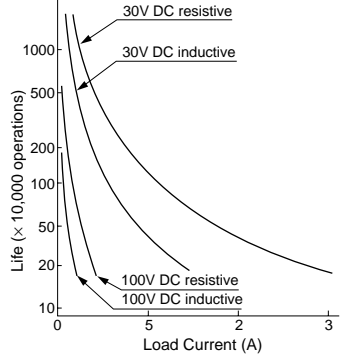
(RY4)



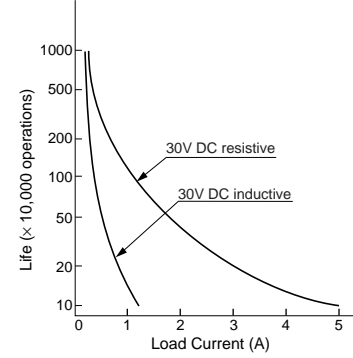
(RY22)



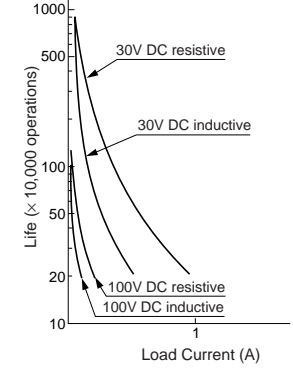
DC Load  
(RY2)



(RY4)

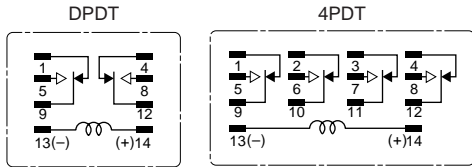


(RY22)

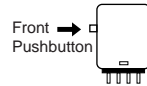


## Internal Connection (Bottom View)

### • Basic Type



### • With Check Button

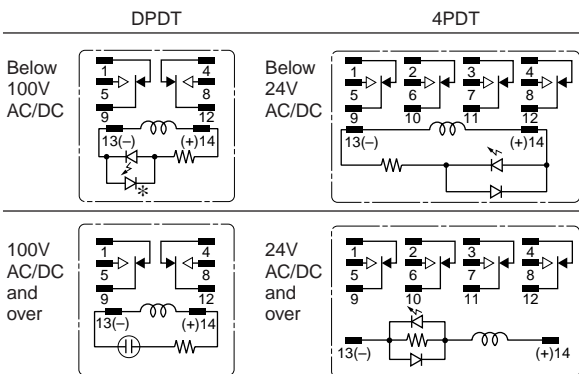


Contacts can be operated by pressing the check button. Press the button quickly to prevent arcing.

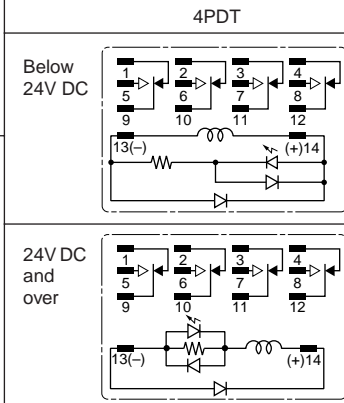
### • With Indicator and Diode (-LD type)

This type contains an operation indicator and a surge absorber, and has the same height as the basic type.

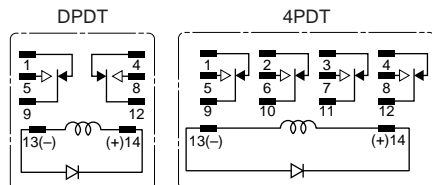
### • With Indicator (-L type)



When the relay is energized, the indicator goes on.  
\* The LED protection diode is not contained in DPDT relays for below 100V DC.



### • With Diode (-D type)



This type contains a diode to absorb the counter emf generated when the coil is deenergized. The release time is slightly longer.

- Diode Characteristics  
Reverse withstand voltage: 1,000V  
Forward current: 1A

# RY Series Miniature Relays

## Dimensions

### • Plug-in Terminal Type

RY2S-U/RYS2S-UL  
RY2S-UD

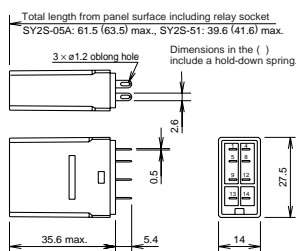


(Photo: RY2S-U)

RY22S-U/RYS22S-UL  
RY22S-UD



(Photo: RY22S-U)



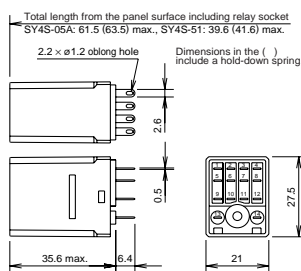
### • Applicable Socket and Hold-down Spring

Socket		Hold-down Spring
Mounting Style	Type No.	
DIN Rail Mount Socket	SY2S-05A	SY2S-02F1 SFA-101 SFA-202
	SY2S-05C	
Panel Mount Socket	SY2S-51	SY4S-51F1 SFA-301 SFA-302
PC Board Mount Socket	SY2S-61	

RY4S-U/RYS4S-UL/RYS4S-UD/RYS4S-ULD



(Photo: RY4S-U)



### • Applicable Socket and Hold-down Spring

Socket		Hold-down Spring
Mounting Style	Type No.	
DIN Rail Mount Socket	SY4S-05A	SY4S-02F1 SFA-101 SFA-202
	SY4S-05C	
	SY4S-05D SY4S-05DF	
Panel Mount Socket	SY4S-51	SY4S-51F1 (SY4S-02F1) SFA-301 SFA-302
PC Board Mount Socket	SY4S-61	
	SY4S-62	SY4S-51F1 (SY4S-02F1)

Note: (SY4S-02F1) is for the relay with check button.

### • PC Board Terminal Type

RY2V-U/RYS2V-UL/RYS2V-UD



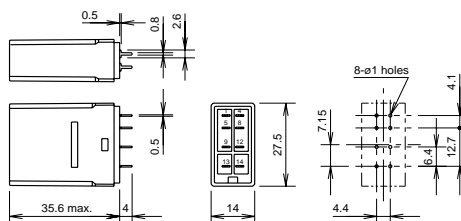
(Photo: RY2V-U)



RY22V-U/RYS22V-UL/RYS22V-UD



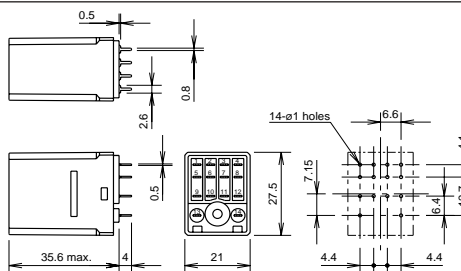
(Photo: RY22V-U)



RY4V-U/RYS4V-UL



(Photo: RY4V-U)

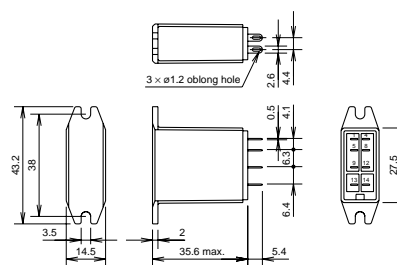


### • Top Bracket Mounting Type (Plug-in Terminal)

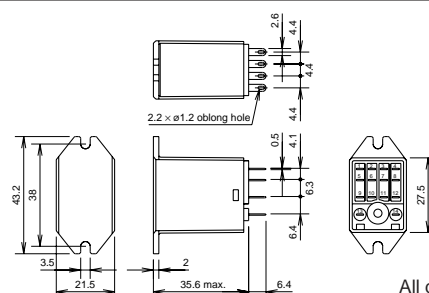
RY2S-UT



RY22S-UT



RY4S-UT



All dimensions in mm.