

# Section E

New  
New

**Selection Guides ..... E-2**

## **General Purpose Relays**

- RJ Series ..... E-3
- RQ Series ..... E-6
- RU Series ..... E-8
- RH Series ..... E-12
- RR Series ..... E-18
- RY/RM Series ..... E-22

## **Latching Relays**

- RR2KP Series ..... E-27
- RH2L Series ..... E-30
- RY2KS Series ..... E-33

## **Solid State Relays**

- RSS Series ..... E-36

# Relays

for more information on this product family visit

**[www.idec.com/relay](http://www.idec.com/relay)**




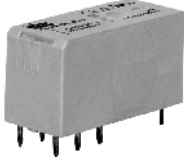



### **Additional Web Resources**

- New and updated product information
- Downloadable software demos & upgrades
- Part configuration tool & cross reference
- Online stock check & ordering
- IDEC field sales & distributor search
- Online literature request
- Downloadable manuals & CAD drawings
- Manufacturer's suggested retail price list
- Product training schedule & locations
- Advertising & trade show schedules
- Press releases & FAQs



**[www.idec.com/relay](http://www.idec.com/relay)**

## Selection Guides


### General Purpose Relays

	RJ Series	RQ Series	RU Series	RH Series	RR Series
<b>Appearance</b>					
<b>Page</b>	E-3	E-6	E-8	E-12	E-18
<b>Contact Configuration</b>	SPDT, DPDT	SPDT, DPDT	DPDT, 4PDT	SPDT, DPDT, 3PDT, 4PDT	SPDT, DPDT, 3PDT
<b>Contact Rating (resistive)</b>	SPDT: 12A, 30V DC/250V AC DPDT: 8A, 30V DC/250V AC	SPDT: 12A, 16A DPDT: 8A	DPDT: 10A, 30V DC/250V AC 4PDT: 6A, 30V DC/250V AC 1/10 HP, 240V AC Bifurcated: 3A 250V AC	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
<b>Contact Material</b>	Silver-Nickel alloy	Silver-Nickel alloy	DPDT: AgSnOIn (Silver Tin Oxide Indium) 4PDT: AuAg/Ag (Gold-Silver Alloy on Silver)	Silver-Cadmium Oxide	Silver




### General Purpose Relays

	RY/RM Series	
<b>Appearance</b>		
<b>Page</b>	E-22	
<b>Contact Configuration</b>	DPDT, 4PDT	DPDT
<b>Contact Rating (resistive)</b>	RY: DPDT: 3A, 30V DC/240V AC 4PDT: 5A, 30V DC/240V AC Bifurcated: 1A 30V DC/120V AC	5A, 30V DC/240V AC
<b>Contact Material</b>	Standard: Gold plated silver Bifurcated: Ag-Pd	Silver

### Solid State Relays

	RSS Series
<b>Appearance</b>	
<b>Page</b>	E-36
<b>Contact Configuration</b>	1 Form A (SPST-NO)
<b>Contact Rating</b>	10, 25, 50, 75, 90A 48V AC to 660V AC Output
<b>Output</b>	Dual SCR (zero crossing)

### Latching Relays

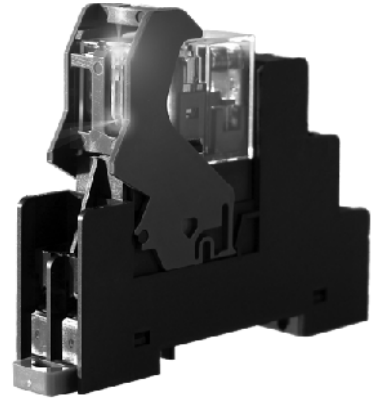
	RR2KP Series	RH2L Series	RY2KS
<b>Appearance</b>			
<b>Page</b>	E-27	E-30	E-33
<b>Contact Configuration</b>	DPDT	DPDT	DPDT
<b>Contact Rating (resistive)</b>	10A, 30V DC 10A, 120V AC	10A, 30V DC 10A, 120V AC 7.5A, 240V AC	3A, 30V DC 3A, 120V AC
<b>Contact Material</b>	Silver	Silver-cadmium oxide	Silver, gold-plated

## **RJ Series — General Purpose Relays**

RJ relays, the newest addition to our relay family, were designed with the same attention-to-detail IDEC is known for. One feature that exemplifies this is an optional LED. It uses a unique light guide to give you a brighter and more noticeable status indicator from multiple directions.

Key features of the RJ series include:

- Compact size: 12.7 x 27 x 28.8 mm
- Contact rating: 8A (DPDT), 12A (SPDT)
- Operational life:  
200K cycles at full resistive load  
50 million cycles, no load
- Optional, green, non-polarized LED
- RoHS compliant



			RJ1S	RJ2S
Specifications	No. of poles		1	2
	Contact Configuration		SPDT	DPDT
	Contact Rating		12A	8A
	Contact Material		Silver-Nickel alloy	
	Contact Resistance		50 milliohms max	
	Operating Time		15 ms max	
	Release Time		10 ms max	
	Dielectric Strength	Between contact and coil	5,000VAC, 1 minute	
		Between contacts	1,000VAC, 1 minute	
	Vibration Resistance	Damage limits	10-55Hz, amplitude 0.75mm	
		Operating extremes	10-55Hz, amplitude 0.75mm	
	Shock Resistance	Damage limits	100m/s <sup>2</sup> min (10G)	
		Operating extremes	1,000m/s <sup>2</sup> min (100G)	
	Mechanical Life	AC	30,000,000 operations	
		DC	50,000,000 operations	
	Electrical Life @ Full Rated Load	AC	200,000 operations	
		DC	100,000 operations	
Operating Temperature			-40 to 70° C	
Operating Humidity			5 to 85% RH	
Dimensions (H x W x D mm)			12.7 x 27 x 28.8	
Weight (Approx.)			19g	



UL Recognized  
File No. E555996, Vol 1, sec. 11



CSA Certified  
File No. LR35144



**E**  
Relays

### **Ordering Information**

Consult factory for other voltages.

Basic Part No.

Coil Voltage:

RJ  S - C  -

# of Contacts

1 = SPDT

2 = DPDT

Option

(Blank) = Standard

L = LED

Coil Voltage Code

D12 = 12V DC

D24 = 24V DC



D100 = 100-110V DC

A24 = 24V AC

A120 = 120V AC

A240 = 240V AC

**Part Numbers**

Type	Contacts	Coil Voltage	Standard	with Indicator Light
	SPDT	12V DC	RJ1S-C-D12	RJ1S-CL-D12
		24V DC	RJ1S-C-D24	RJ1S-CL-D24
		100-110V DC	RJ1S-C-D100	RJ1S-CL-D100
		24V AC	RJ1S-C-A24	RJ1S-CL-A24
		120V AC	RJ1S-C-A120	RJ1S-CL-A120
		240V AC	RJ1S-C-A240	RJ1S-CL-A240
	DPDT	12V DC	RJ2S-C-D12	RJ2S-CL-D12
		24V DC	RJ2S-C-D24	RJ2S-CL-D24
		100-110V DC	RJ2S-C-D100	RJ2S-CL-D100
		24V AC	RJ2S-C-A24	RJ2S-CL-A24
		120V AC	RJ2S-C-A120	RJ2S-CL-A120
		240V AC	RJ2S-C-A240	RJ2S-CL-A240

E

Relays

**Socket Part Numbers (DIN Rail or Panel Mount):**

Part Numbers	Description
SJ1S-05B	SPDT Standard Screw Terminal
SJ1S-07L	SPDT Finger-safe Screw Terminal
SJ2S-05B	DPDT Standard Screw Terminal
SJ2S-07L	DPDT Finger-safe Screw Terminal
SJ9Z-C	Replacement Locking Lever


**Ratings**
**Coil Ratings at 20°C (relays with LED indicator)**

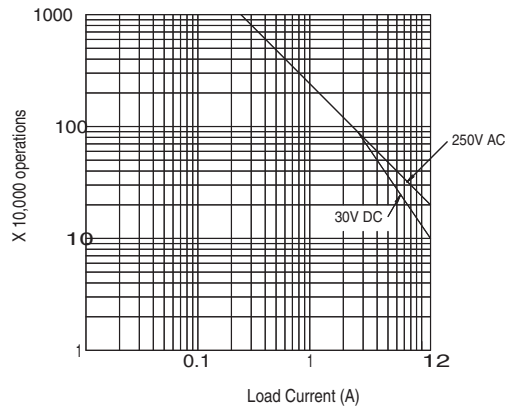
Coil Sensitivity	Nominal Voltage	Nominal Current	Coil Resistance	Power Consumption	Pull-in Voltage	Drop-Out Voltage	Max Allowable Voltage
DC Coil	12V	48mA	271Ω	0.53W	70% Max	10% Min	170%
	24V	25.7mA	1,080Ω				
	100-110V	5.2-5.7mA	18,870Ω				160%
AC Coil (60Hz)	24V	41.1mA	243Ω	0.9VA	80% Max	30% Min	140%
	120V	8.1mA	5270Ω				
	240V	4.1mA	21,530Ω				

**Contact Ratings**

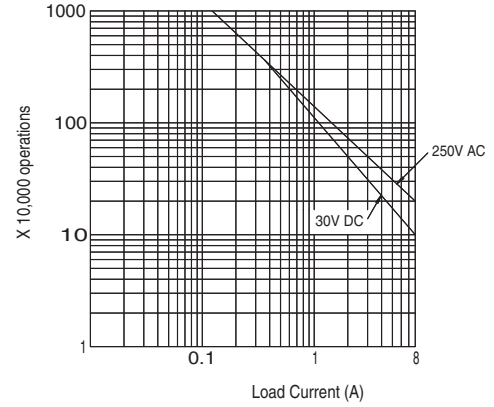
		Contact	RJ1S	RJ2S
Contact Load Ratings	Resistive Load (Max)	NO Contact	12A @ 250VAC/30VDC	8A @ 250VAC/30VDC
		NC Contact	12A @ 250VAC; 6A @ 30VDC	8A @ 250VAC; 4A @ 30VDC
	Inductive Load (Max)	NO Contact	7.5A @ 250VAC; 6A @ 30VDC	4A @ 250VAC; 4A @ 30VDC
		NC Contact	7.5A @ 250VAC; 3A @ 30VDC	4A @ 250VAC; 2A @ 30VDC
	Min Applicable Load (reference value)		100mA @ 5VDC	10mA @ 5VDC
Contacts Max Power Allowed	Resistive Load (Max)	NO Contact	AC: 3,000VA; DC: 360W	AC: 2,000VA; DC: 240W
		NC Contact	AC: 3,000VA; DC: 180W	AC: 2,000VA; DC: 120W
	Inductive Load (Max)	NO Contact	AC: 1,875VA; DC: 180W	AC: 1,000VA; DC: 120W
		NC Contact	AC: 1,875VA; DC: 90W	AC: 1,000VA; DC: 60W

## Electrical Life Curves

**RJ1S**  
(Resistive Load)

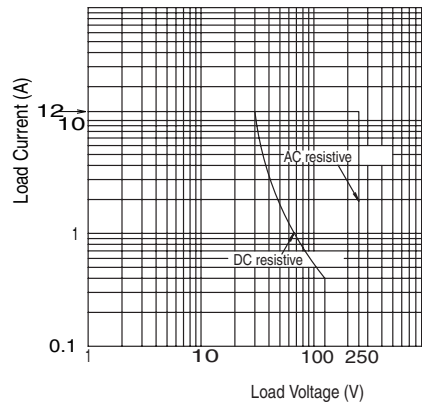


**RJ2S**  
(Resistive Load)

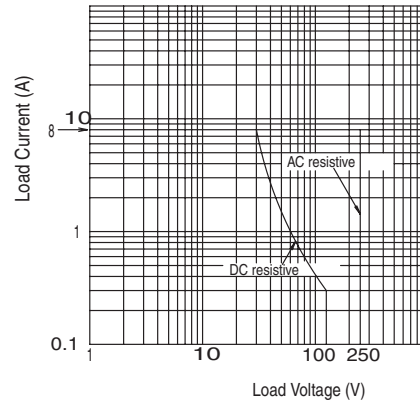


## Maximum Switching Capacity

**RJ1S**

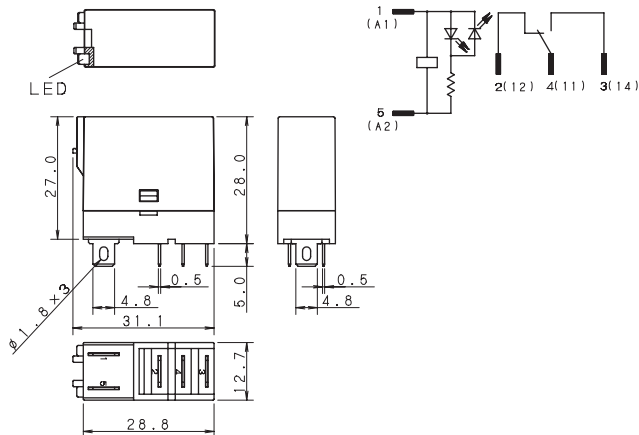


**RJ2S**

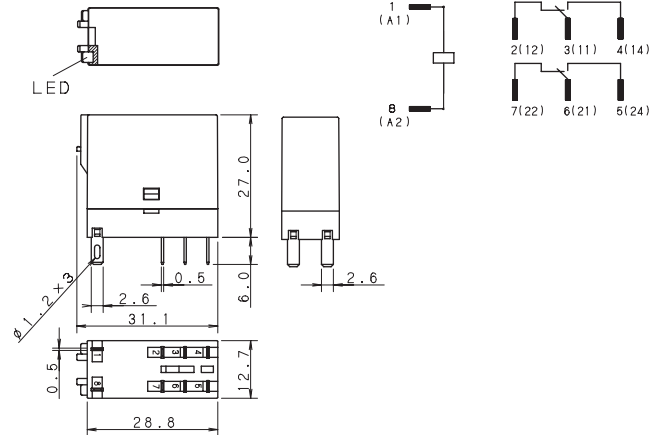


## Dimensions

**RJ1S**



**RJ2S**



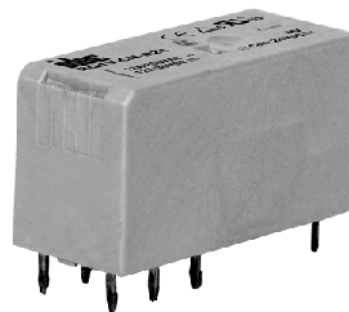
Dimensions are in mm.

## RQ Series — General Purpose Relays

IDEC's RQ relays are low-profile, PCB relays that provide quality within a compact package. Size equals value. RQ relays are small, yet maintain high contact ratings and long operational life. For larger power needs, a 16A model is also available.

Key features of the RQ series include:

- Low profile: 29 x 12.7 x 15 mm
- Contact rating: 8A (DPDT) and 12A (SPDT)
- Power relay model with 16A contact rating (SPDT)
- Operational life:  
100K cycles at full resistive load  
10 million cycles, no load
- LED/Diode Plug-in modules available with DIN rail socket
- Lead-free



E

Relays

Specifications

		RQ1	RQ2	RQ1 HC
No. of poles		1	2	1
Contact Configuration		SPDT	DPDT	SPDT
Contact Rating		12A	8A	16A
Contact Material		Silver-Nickel alloy		
Contact Resistance		100 milliohms max		
Operating Time		12 ms max		
Release Time		8 ms max		
Dielectric Strength	Between contact & coil	5,000VAC, 1 minute		
	Between contacts	1,000VAC, 1 minute		
Vibration Resistance	Damage limits	10-55 Hz, amplitude 1.5mm		
	Operating extremes	10-55 Hz, amplitude 1.5mm		
Shock Resistance	Damage limits	100m/s <sup>2</sup> min (10G)		
	Operating extremes	1,000m/s <sup>2</sup> min (100G)		
Mechanical Life		10,000,000 operations		
Electrical Life @ Full Rated Load		100,000 operations		
Operating Temperature		-40 to 85° C		
Operating Humidity		45 to 85% RH		
Dimensions (H x W x D mm)		29 x 12.7 x 15		
Weight (Approx.)		15g		



UL Recognized  
File No. E59804, Vol 1



TÜV Rheinland  
R500562600001

## Ordering Information

Consult factory for other voltages.

Basic Part No.

Coil Voltage:

RQ  V - C  -

# of Contacts

1 = SPDT  
2 = DPDT

Pin Spacing

M = 3.5mm, SPDT 12A  
H\* = 5mm, SPDT 16A  
N = 5mm, DPDT 8A



\*DPDT footprint

Coil Voltage Code

D12 = DC12V  
D24 = DC24V  
A24 = AC24V  
A115 = AC120V  
A230 = AC240V

## Part Numbers

Coil Voltage	SPDT 12A	DPDT 8A	SPDT 16A
12V DC	RQ1V-CM-D12	RQ2V-CN-D12	RQ1V-CH-D12
24V DC	RQ1V-CM-D24	RQ2V-CN-D24	RQ1V-CH-D24
24V AC	RQ1V-CM-A24	RQ2V-CN-A24	RQ1V-CH-A24
120V AC	RQ1V-CM-A115	RQ2V-CN-A115	RQ1V-CH-A115
240V AC	RQ1V-CM-A230	RQ2V-CN-A230	RQ1V-CH-A230



## **Ratings**

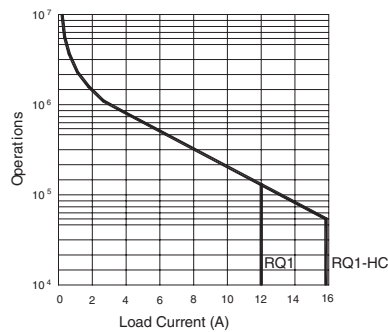
### **Coil Ratings**

Coil Sensitivity	Nominal Voltage	Nominal Current	Coil Resistance	Power Consumption	Pull-in Voltage	Drop-Out Voltage	Max Allowable Voltage
DC Coil	12V	33.3mA	360Ω	0.40W	80% Max	5% Min	130%
	24V	16.7mA	1,440Ω				
	110V	4.1mA	26,530Ω				
AC Coil (60 Hz)	24V	25.35mA	350Ω	0.61W		30% Min	
	115V	6.3mA	8,100Ω	0.73W			
	230V	2.72mA	32,500Ω	0.63W			

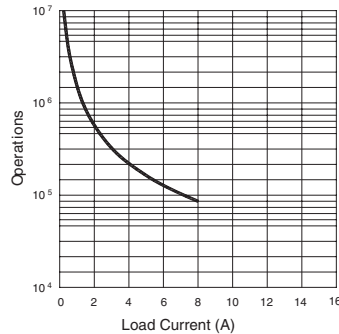
## **Electrical Life Curves/Maximum Switching Capacity**

### **Electrical Life Curves**

#### **RQ1 & RQ1 High Capacity**

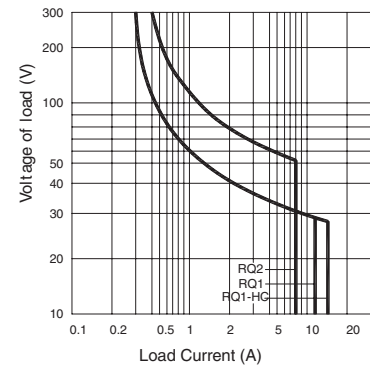


#### **RQ2**



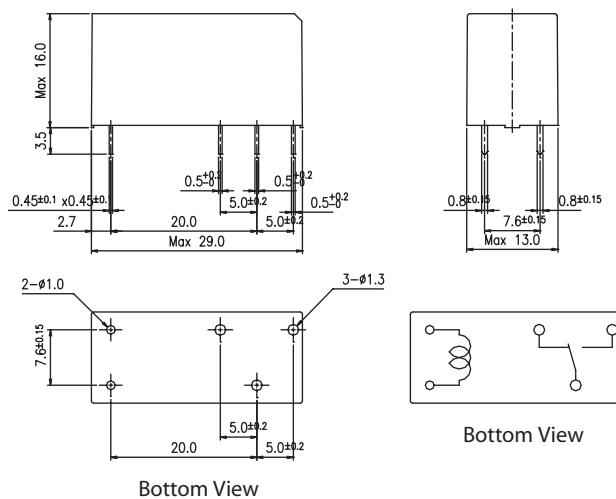
### **Maximum Switching Capacity**

#### **RQ1, RQ1 High Capacity & RQ2**

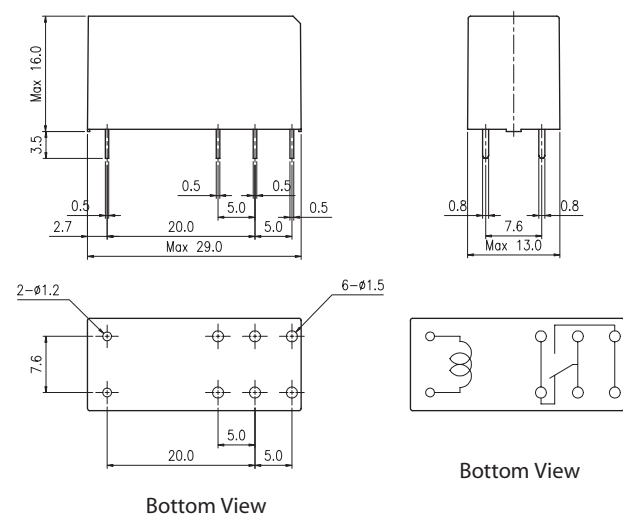


## **Dimensions & Mounting Hole Layouts**

### **RQ1**



### **RQ2/RQ1 HC**



### **Part Numbers: Accessories**

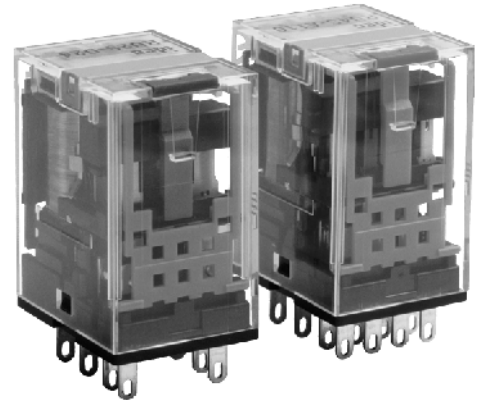
Part Numbers	Description
SQ1V-07B	SPDT Finger-safe Socket
SQ2V-07B	DPDT Finger-safe Socket
SQ9Z-C	Replacement Retaining Clip
SQ9Z-LD	Socket Plug-in LED & Diode Module (6-24V DC)
SQ9Z-LR	Socket Plug-in LED & RC Module (110-230V AC)
SQ9Z-P	Replacement Marking Plate

Dimensions are in mm.

## 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



E

Relays

Specifications

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



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



B020813332451



CSA Certified  
File No. LR35144-135844



## 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	Springs & Clips (optional)	
						Part Number	Use With
RU2S	SU2S-11L	SM2S-05	SM2S-05C	SY4S-51	SY4S-61 SY4S-62	SFA-101① SFA-202② SY4S-02F1③	use with SY4S-05, -05C SM2S-05, -05C SU4S-11L, SU2S-11L
RU4S	SU4S-11L	SY4S-05	SY4S-05C			SFA-301① SFA-302② SY4S-51F1③	use with SY4S-51, -61



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



- 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.

E

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)

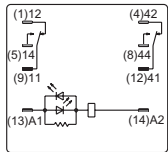
Voltage		Resistive	Inductive
30V DC	DPDT	10A	5A
	4PDT	6A	3A
110V DC	DPDT	0.6A	0.3A
	4PDT	0.4A	0.2A
120V AC	DPDT	10A	5A
	4PDT	6A	3A
240V AC	DPDT	10A	5A
	4PDT	6A	3A

### Contact Ratings (Bifurcated)

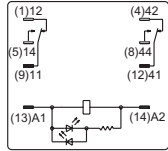
Voltage		Resistive	Inductive
30V DC	4PDT	3A	1.5A
110V DC	4PDT	—	—
120V DC	4PDT	3A	0.8A
250V DC	4PDT	3A	0.8A

Internal Circuit\*

**RU2S Standard**

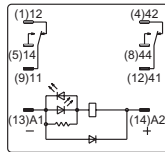


Over 24V AC/DC

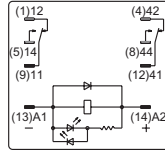


24V AC/DC or less

**RU2S-D with Diode**

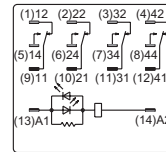


Over 24V DC

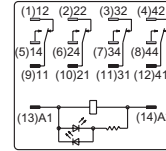


24V DC or less

**RU4S/RU42S Standard**

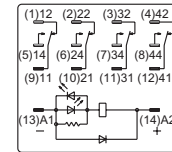


Over 24V AC/DC

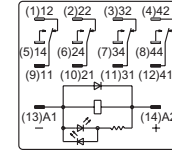


24V AC/DC or less

**RU4S-D/RU42S-D with Diode**



Over 24V DC



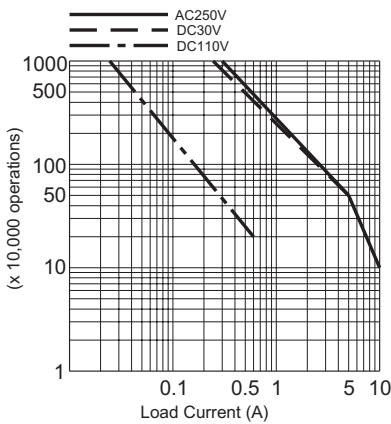
24V DC or less

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

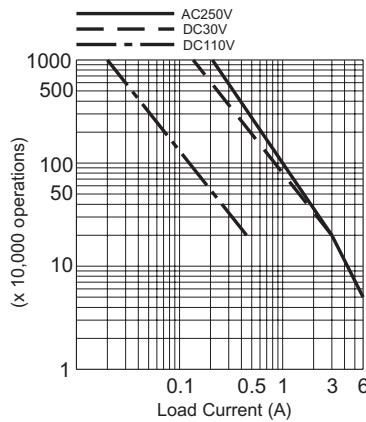
Numbers not in parenthesis follow international system of labeling terminals.

Electrical Life Curves

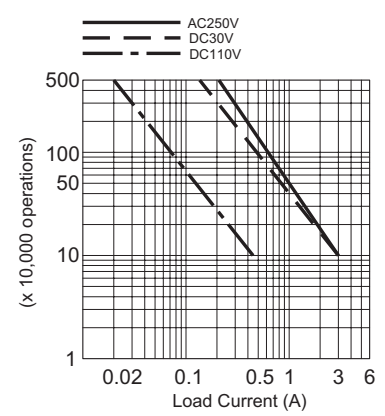
**RU2 (Resistive Load)**



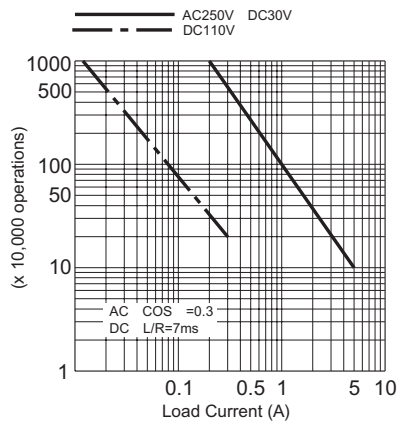
**RU4 (Resistive Load)**



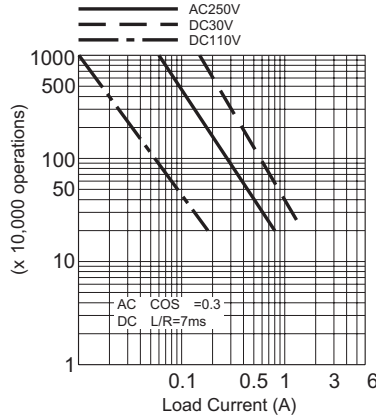
**RU42 (Resistive Load)**



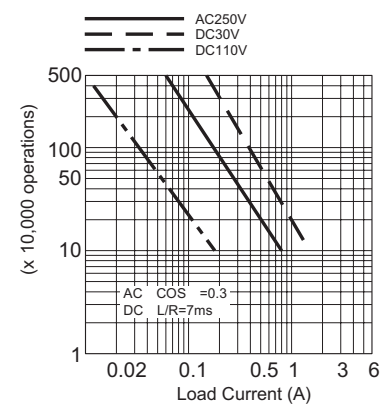
**RU2 (Inductive Load)**



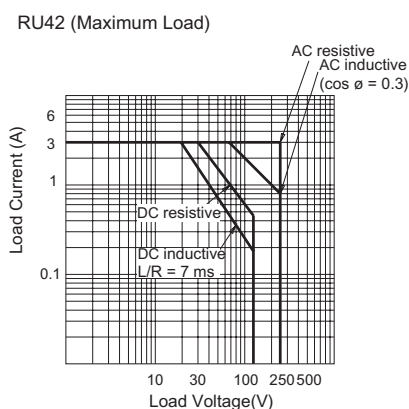
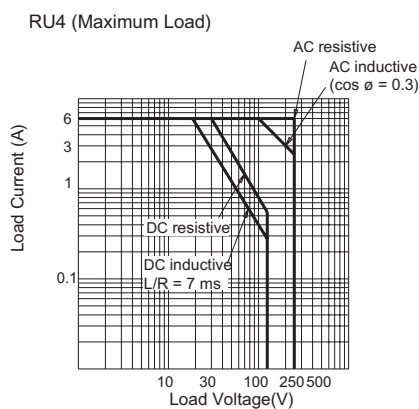
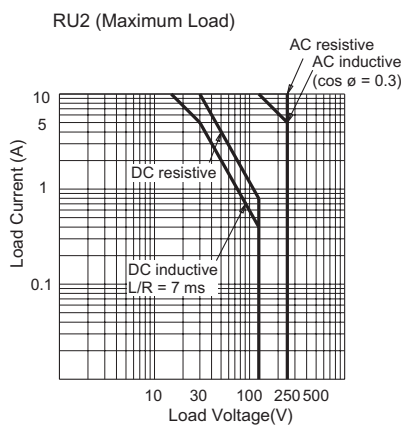
**RU4 (Inductive Load)**



**RU42 (Inductive Load)**

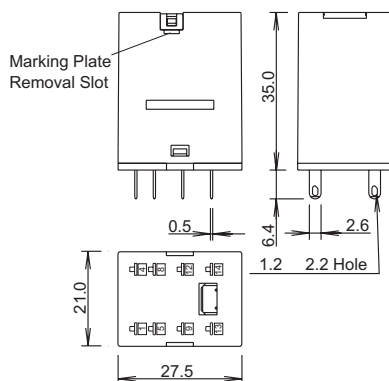


## **Maximum Switching Capacity**



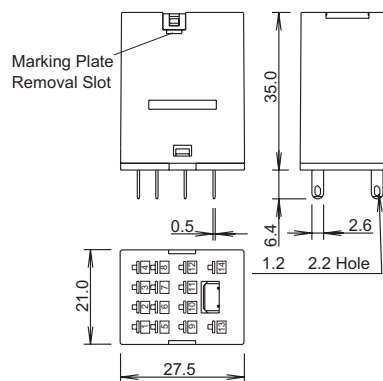
## **Dimensions & Mounting Hole Layouts**

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



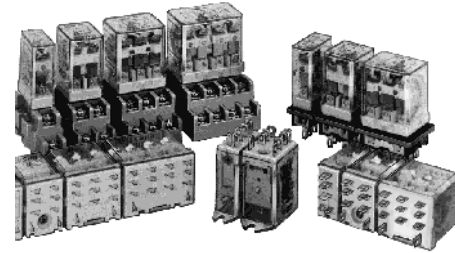
Marking plate removal slot is provided only on one side.  
Insert a flat screwdriver into the slot to remove the marking plate.

Dimensions are in mm.

## RH Series — General Purpose Midget Relays

Key features of the RH series include:

- Compact midget size saves space
- High switching capacity (10A)
- Choice of blade or PCB style terminals
- Relay options include indicator light, check button, and top mounting bracket
- DIN rail, surface, panel, and PCB type sockets available for a wide range of mounting applications



UL Recognized  
Files No. RH1 = E66043  
RH2 = E66043  
RH3 = E66043  
RH4 = E55996



CSA Certified  
File No. LR35144



File No. B020813332452



E

Relays

Specifications

<b>Contact Material</b>	Silver cadmium oxide
<b>Contact Resistance</b>	50mΩ maximum (initial value)
<b>Minimum Applicable Load</b>	24V DC/30mA, 5V DC/100mA (reference value)
<b>Operating Time</b>	SPDT (RH1), DPDT (RH2): 20ms maximum 3PDT (RH3), 4PDT (RH4): 25ms maximum
<b>Release Time</b>	SPDT (RH1), DPDT (RH2): 20ms maximum 3PDT (RH3), 4PDT (RH4): 25ms maximum
<b>Maximum Continuous Applied Voltage (AC/DC) at 20°C</b>	110% of the rated voltage
<b>Minimum Operating Voltage (AC/DC) at 20°C</b>	80% of the rated voltage
<b>Drop-Out Voltage (AC)</b>	30% or more of the rated voltage
<b>Drop-Out Voltage (DC)</b>	10% or more of the rated voltage
<b>Power Consumption</b>	<b>SPDT (RH1):</b> DC: 0.8W AC: 1.1VA (50Hz), 1VA (60Hz) <b>DPDT (RH2):</b> DC: 0.9W AC: 1.4VA (50Hz), 1.2VA (60Hz) <b>3PDT (RH3):</b> DC: 1.5W AC: 2VA (50Hz), 1.7VA (60Hz) <b>4PDT (RH4):</b> DC: 1.5W AC: 2.5VA (50Hz), 2VA (60Hz)
<b>Insulation Resistance</b>	100MΩ min (measured with a 500V DC megger)
<b>Dielectric Strength</b>	<b>SPDT (RH1)</b> Between live and dead parts: 2,000V AC, 1 minute; Between contact circuit and operating coil: 2,000V AC, 1 minute; Between contacts of the same pole: 1,000V AC, 1 minute <b>DPDT (RH2), 3PDT (RH3), 4PDT (RH4)</b> Between live and dead parts: 2,000V AC, 1 minute; Between contact circuit and operating coil: 2,000V AC, 1 minute; Between contact circuits: 2,000V AC, 1 minute; Between contacts of the same pole: 1,000V AC, 1 minute
<b>Frequency Response</b>	1,800 operations/hour
<b>Temperature Rise</b>	Coil: 85°C maximum Contact: 65°C maximum
<b>Vibration Resistance</b>	0 to 6G (55Hz maximum)
<b>Shock Resistance</b>	SPDT/DPDT: 200N (approximately 20G) 3PDT/4PDT: 100N (approximately 10G)
<b>Life Expectancy</b>	Electrical: over 500,000 operations at 120V AC, 10A; (over 200,000 operations at 120V AC, 10A for SPDT [RH1], 3PDT [RH3], 4PDT [RH4]) Mechanical: 50,000,000 operations
<b>Operating Temperature</b>	-30 to +70°C
<b>Weight</b>	SPDT: 24g, DPDT: 37g (approximately) 3PDT: 50g, 4PDT: 74g (approximately)

## Ordering Information

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

**Basic Part No.**

RH2B-U

**Coil Voltage:**

AC110-120V

## Part Numbers

### Part Numbers: RH Series with Options

Termination	Contact Configuration	Basic Part No.	Indicator Light	Check Button	Indicator Light and Check Button	Top Bracket
B (blade)	SPDT	RH1B-U	RH1B-UL	RH1B-UC	RH1B-ULC	RH1B-UT
	DPDT	RH2B-U	RH2B-UL	RH2B-UC	RH2B-ULC	RH2B-UT
	3PDT	RH3B-U	RH3B-UL	RH3B-UC	RH3B-ULC	RH3B-UT
	4PDT	RH4B-U	RH4B-UL	RH4B-UC	RH4B-ULC	RH4B-UT
V2 (PCB 0.078" [2mm] wide)	SPDT	RH1V2-U	RH1V2-UL	RH1V2-UC	RH1V2-ULC	—
	DPDT	RH2V2-U	RH2V2-UL	RH2V2-UC	RH2V2-ULC	—
	3PDT	RH3V2-U	RH3V2-UL	RH3V2-UC	RH3V2-ULC	—
	4PDT	RH4V2-U	RH4V2-UL	RH4V2-UC	RH4V2-ULC	—

## Ratings

### Coil Ratings

Rated Voltage		Rated Current ±15% at 20°C								Coil Resistance ±15% at 20°C			
		60Hz				50Hz							
		SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT
AC	6V	150mA	200mA	280mA	330mA	170mA	238mA	330mA	387mA	18.8Ω	9.4Ω	6.0Ω	5.4Ω
	12V	75mA	100mA	140mA	165mA	86mA	118mA	165mA	196mA	76.8Ω	39.3Ω	25.3Ω	21.2Ω
	24V	37mA	50mA	70mA	83mA	42mA	59.7mA	81mA	98mA	300Ω	153Ω	103Ω	84.5Ω
	120V*	7.5mA	11mA	14.2mA	16.5mA	8.6mA	12.9mA	16.4mA	19.5mA	7,680Ω	4,170Ω	2770Ω	2220Ω
	240V†	3.2mA	5.5mA	7.1mA	8.3mA	3.7mA	6.5mA	8.2mA	9.8mA	3,1200Ω	15,210Ω	12,100Ω	9120Ω
		SPDT		DPDT		3PDT		4PDT		SPDT	DPDT	3PDT	4PDT
DC	6V	128mA		150mA		240mA		250mA		47Ω	40Ω	25Ω	24Ω
	12V	64mA		75mA		120mA		125mA		188Ω	160Ω	100Ω	96Ω
	24V	32mA		36.9mA		60mA		62mA		750Ω	650Ω	400Ω	388Ω
	48V	18mA		18.5mA		30mA		31mA		2,660Ω	2,600Ω	1,600Ω	1550Ω
	110V‡	8mA		9.1mA		12.8mA		15mA		13,800Ω	12,100Ω	8,600Ω	7,340Ω



\* For RH2 relays = 110/120V AC.

† For RH2 relays = 220/240V AC.

‡ For RH2 relays = 100/110V DC.

Rated Voltage		Coil Inrush				Coil Inductance							
						Energizing				De-Energizing			
		SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT
AC	6V	250mA	340mA	520mA	620mA	0.09H	0.08H	0.05H	0.05H	0.06H	0.04H	0.03H	0.02H
	12V	120mA	170mA	260mA	310mA	0.037H	0.30H	0.22H	0.18H	0.22H	0.16H	0.12H	0.10H
	24V	56mA	85mA	130mA	165mA	1.5H	1.2H	0.9H	0.73H	0.9H	0.63H	0.5H	0.36H
	120V*	12mA	16mA	26mA	33mA	37H	33H	21H	18H	22H	15H	12H	9H
	240V†	7mA	8mA	12mA	16mA	130H	130H	84H	73H	77H	62H	47H	36H
DC		SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT
	6V												
	12V												
	24V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	48V												
	110V												



\* For RH2 relays = 110/120V AC.

† For RH2 relays = 220/240V AC.

**Ratings con't**
**Contact Ratings**

# of Poles	Max Contact Power		General Ratings		
	Resistive	Inductive	Voltage	Resistive	Inductive*
RH1	AC1540VA DC300W	AC990VA DC210W	AC110	10A	7A
			AC220	7A	4.5A
			DC30	10A	7A
RH2 RH3 RH4	AC1650VA DC300W	AC1100VA DC225W	AC110	10A	7.5A
			AC220	7.5A	5A
			DC30	10A	7.5A



\* $\cos\phi = 0.3$   
L/R - 7ms

**UL Ratings**

Voltage	Resistive			General Use			Horse Power Rating
	RH1, RH2	RH3	RH4	RH1, RH2	RH3	RH4	RH1, RH2 RH3
AC240V	10A	7.5A	7.5A	7A	6.5A	5A	1/3HP
AC120V	10A	10A	10A	7A	7.5A	7.5A	1/6HP
DC30V	10A	10A	—	7A	—	—	—
DC28V	10A	10A	10A	7A	—	—	—

**TÜV Ratings**

Voltage	RH1	RH2	RH3	RH4
AC240V	10A	10A	7.5A	7.5A
DC30V	10A	10A	10A	10A

**CSA Ratings**

Voltage	Resistive				General Use				HP Rating
	RH1	RH2	RH3	RH4	RH1	RH2	RH3	RH4	RH1, 2, 3
AC240V	10A	10A	—	7.5A	7A	7A	7A	5A	1/3HP
AC120V	10A	10A	10A	10A	7.5A	7.5A	—	7.5A	1/6HP
DC30V	10A	10A	10A	10A	7A	7.5A	—	—	—

**Applicable Sockets**
**Part Numbers: Sockets**

Relay	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Surface Mount	Panel Mount	PCB Mount
<b>RH1B</b>	SH1B-05	SH1B-05C	—	SH1B-51	SH1B-62
<b>RH2B</b>	SH2B-05	SH2B-05C	SH2B-02	SH2B-51	SH2B-62
<b>RH3B</b>	SH3B-05	SH3B-05C	—	SH3B-51	SH3B-62
<b>RH4B</b>	SH4B-05	SH4B-05C	—	SH4B-51	SH4B-62



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

**Spring & Clips (optional)**

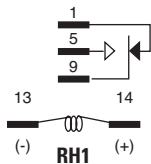
Part Number	Use With
SY2S-02F1③ SFA-101① SFA-202②	SH1B-05, 05C
SY4S-51F1③ SFA-301① SFA-302②	SH1B-51, 62
SY4S-02F1③ SFA-101① SFA-202②	SH2B-05, 05C
SY4S-51F1③ SFA-301① SFA-302②	SH2B-51, 62
SH3B-05F1③ SFA-101①, -202②	SH3B-05, 05C
SY4S-51F1③ SFA-301① SFA-302②	SH3B-51, 62
SH4B-02F1③ SFA-101①, -202②	SH4B-05, 05C
SY4S-51F1③ SFA-301① SFA-302②	SH4B-51, 62



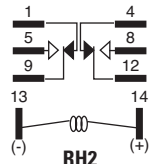
① Top latch  
② Side latch  
③ Pullover spring



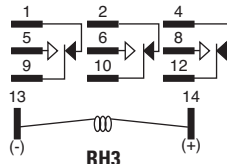
## Internal Circuits



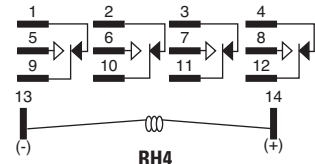
**RH1**



**RH2**



**RH3**



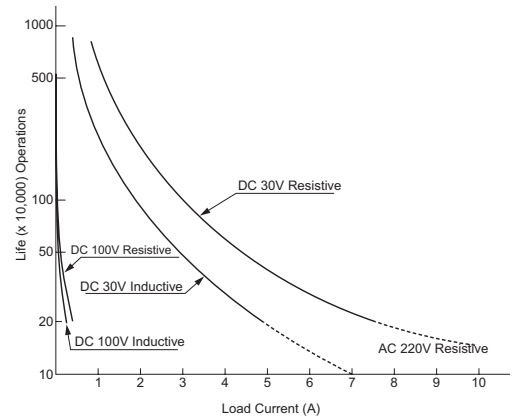
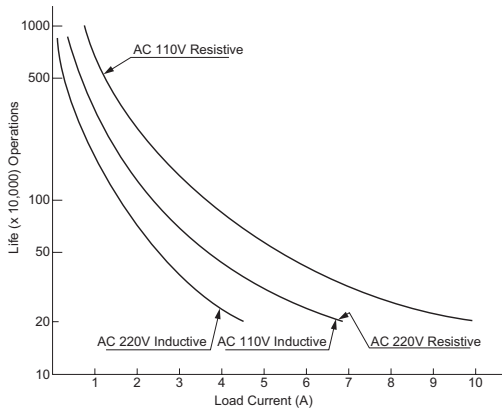
**RH4**



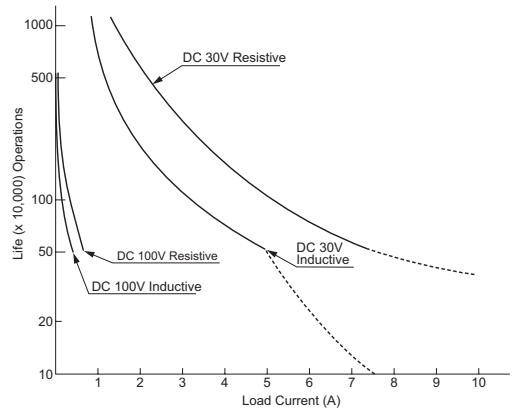
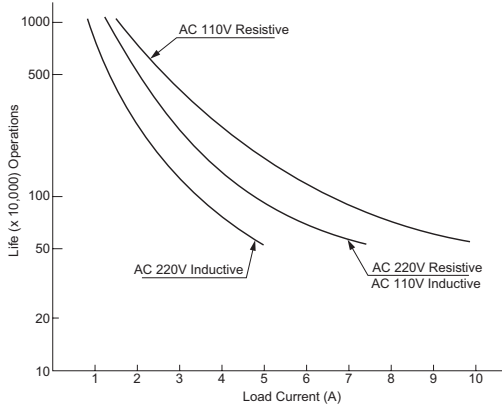
Image as viewed from bottom of relay. Refer to socket for exact wiring layout (Section F).

## Electrical Life Curves

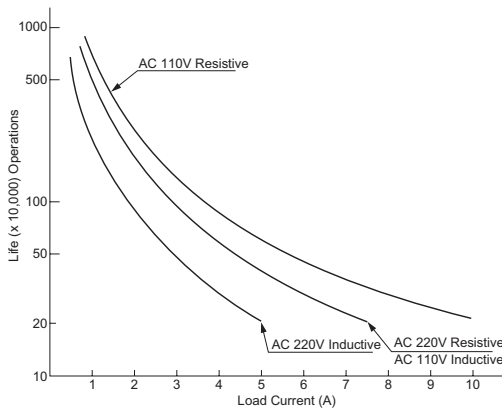
**RH1**



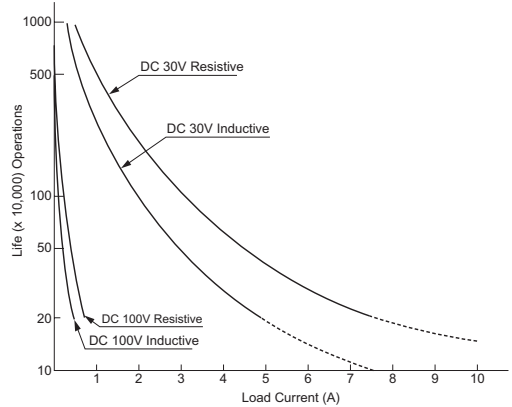
**RH2**



**RH3**

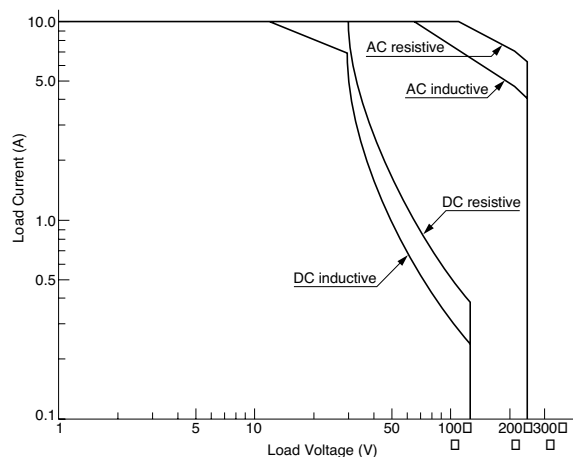


**RH4**

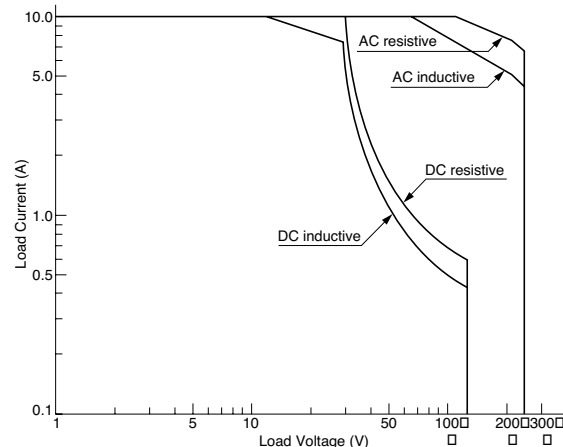
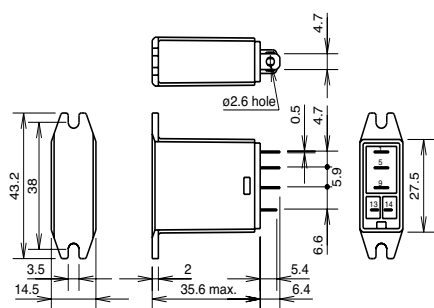


**Maximum Switching Capacity**

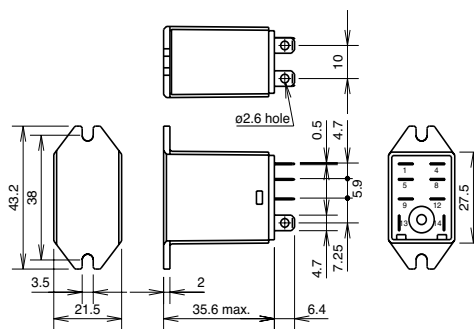
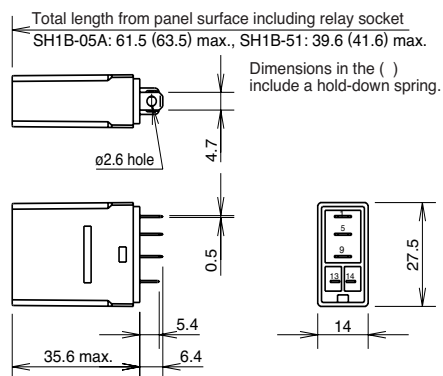
RH1



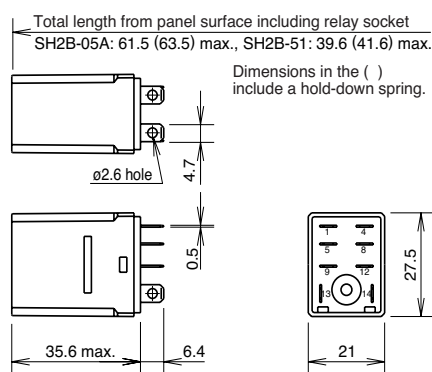
RH2/RH3/RH4


**Dimensions**
**Top Bracket Mounting  
Blade Terminal  
RH1B-UT**


RH2B-UT


**Plug-in Blade Terminal  
RH1B**


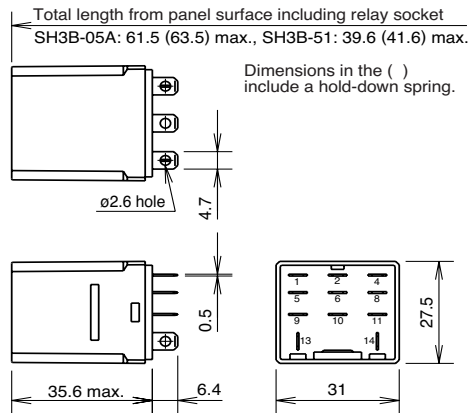
RH2B



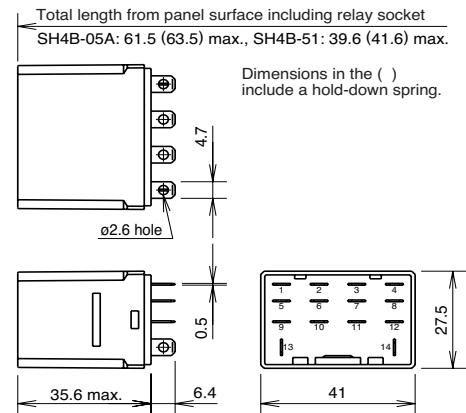
All dimensions in mm.

## Dimensions can't

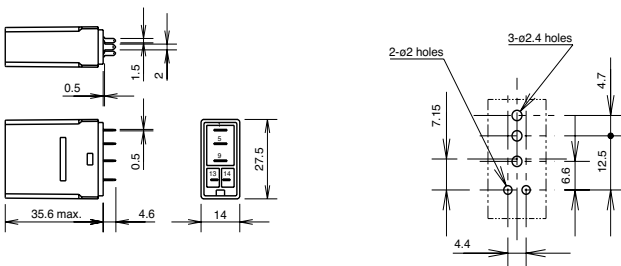
### Plug-in Blade Terminal RH3B



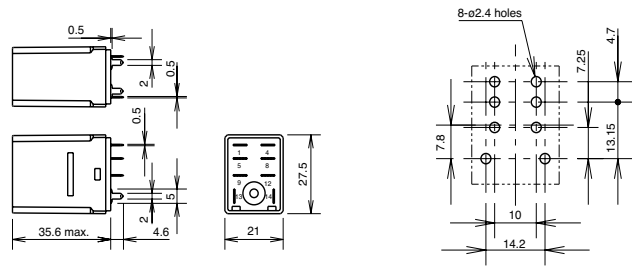
### RH4B



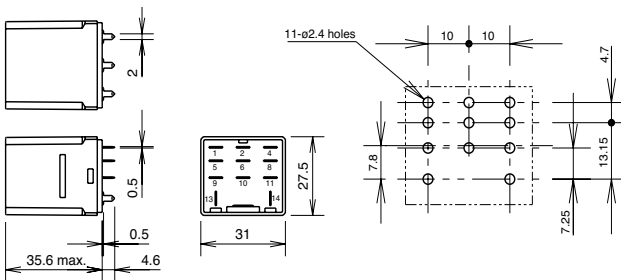
### PCB Terminal RH1V2



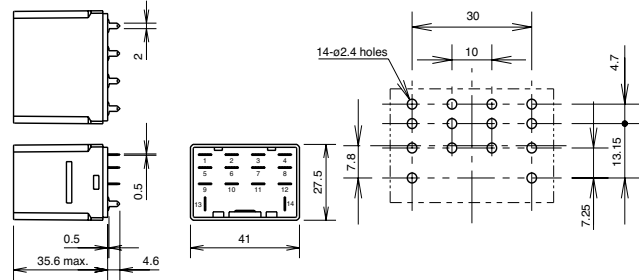
### RH2V2



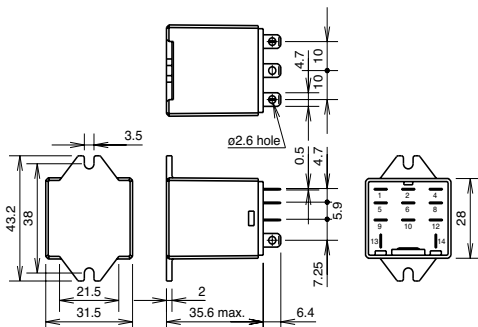
### RH3V2



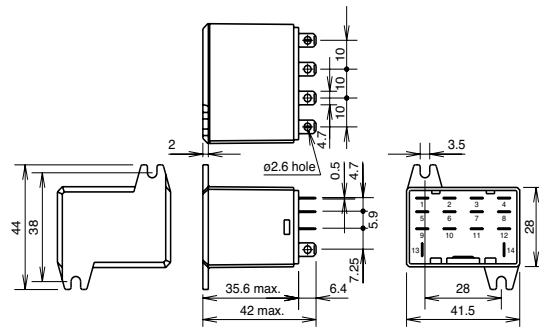
### RH4V2



### RH3B-UT



### RH4B-UT

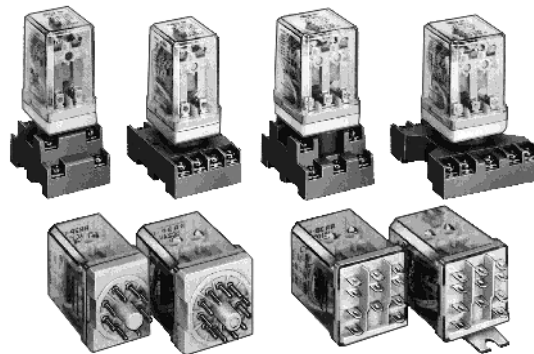


All dimensions in mm.

## RR Series — General Purpose Power Relays

Key features of the RR series include:

- High reliability and long service life
- Available in octal (8- and 11-pin) or square (11-blade) base
- Options include check button for test operation, indicator light, and side flange (contact IDEC for diodes)
- DIN rail, surface and panel type sockets available for a wide range of mounting applications



UL Recognized  
File No. E66043



CSA Certified  
File No. LR35144



File No. B020813332452\*  
\* Pin Style Only  
(does not apply to blade style)



\* Pin Style Only

Relays

Specifications

<b>Contact Material</b>	Silver
<b>Contact Resistance</b>	30mΩ maximum (initial value)
<b>Minimum Applicable Load</b>	24V DC/10mA, 5V DC/20mA (reference value)
<b>Operating Time</b>	25ms maximum
<b>Release Time</b>	25ms maximum
<b>Maximum Continuous Applied Voltage (AC/DC) at 20°C</b>	110% of the rated voltage
<b>Minimum Operating Voltage (AC/DC) at 20°C</b>	80% of the rated voltage
<b>Drop-Out Voltage (AC) at 20°C</b>	30% of the rated voltage
<b>Drop-Out Voltage (DC) at 20°C</b>	15% of the rated voltage
<b>Power Consumption</b>	AC: approximately 3VA (50Hz), 2.5VA (60Hz) DC: approximately 1.5W
<b>Insulation Resistance</b>	100MΩ minimum (measured with 500V DC megger)
<b>Dielectric Strength</b>	<b>Pin</b> (RR2P, RR3PA) Between live and dead parts: 1,500V AC, 1 minute Between contact circuit and operating coil: 1,500V AC, 1 minute Between contact circuits: 1,500V AC, 1 minute (1,000V AC between NO-NC contacts)  <b>Blade</b> (RR1BA, RR2BA, RR3B) Between live and dead parts: 2,000V AC, 1 minute Between contact circuit and operating coil: 2,000V AC, 1 minute Between contact circuits: 2,000V AC, 1 minute Between contacts of same polarity: 1,000V AC, 1 minute
<b>Frequency Response</b>	1,800 operations/hour
<b>Temperature Rise</b>	Coil: 85°C maximum Contact: 65°C maximum
<b>Vibration Resistance</b>	0 to 6G (55Hz maximum)
<b>Shock Resistance</b>	100N (approximately 10G)
<b>Life Expectancy</b>	Electrical: over 500,000 operations (120V, 50/60Hz, 10A) Mechanical: over 10,000,000 operations
<b>Operating Temperature</b>	−30 to +70°C
<b>Weight</b>	RR2P: 90g, RR3PA: 96g (approximately) RR1BA/RR2BA/RR3B: 82g (approximately)

## Ordering Information

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

**Basic Part No.**

**RR3PA-U**

**Coil Voltage:**

**AC120V**

## Part Numbers

### Part Numbers: RR Series with Options

Termination	Contact Configuration	Basic Part No.	Indicator Light	Check Button	Light and Check Button	Side Flange
P, PA (pin)	DPDT	RR2P-U	RR2P-UL	RR2P-UC	RR2P-ULC	—
	3PDT	RR3PA-U	RR3PA-UL	RR3PA-UC	RR3PA-ULC	—
B, BA (blade)	SPDT	RR1BA-U	RR1BA-UL	RR1BA-UC	RR1BA-ULC	RR1BA-US
	DPDT	RR2BA-U	RR2BA-UL	RR2BA-UC	RR2BA-ULC	RR2BA-US
	3PDT	RR3B-U	RR3B-UL	RR3B-UC	RR3B-ULC	RR3B-US



1. RR1BA, RR2BA, and RR3PA are U.S. standard terminal arrangements.
2. For diode option on DC coils please consult factory.

## Ratings

### Coil Ratings

Rated Voltage		Rated Current ±15% at 20°C		Coil Resistance ±10% at 20°C	Inrush Current	Inductance	
		60Hz	50Hz			Energizing	De-Energizing
AC	6V	420mA	490mA	4.9Ω	720mA	0.04H	0.02H
	12V	210mA	245mA	18Ω	365mA	0.15H	0.08H
	24V	105mA	121mA	79Ω	182mA	0.57H	0.32H
	120V	20.5mA	24mA	2100Ω	35mA	15H	8.2H
	240V	10.5mA	12.1mA	8330Ω	18mA	57H	32H
DC	6V	240mA		25Ω	N/A		
	12V	120mA		100Ω			
	24V	60mA		400Ω			
	48V	30mA		1600Ω			
	110V	13mA		8460Ω			

### Contact Ratings

Voltage	Resistive			Inductive			Motor Load
	Nominal	UL	CSA	Nominal	UL	CSA	UL
30V DC	10A	10A	10A	7.5A	7A	7.5A	—
110V DC	0.5A	—	—	0.3A	—	0.5A	—
120V AC	10A	10A	10A	7.5A	7.5A	7.5A	1/4 hp
240V AC	7.5A	10A	10A	5A	7A	7A	1/3 hp



Inductive load:  
 $\cos \phi = 0.3$ ,  $L/R = 7\text{ms}$ .

## Applicable Sockets

### Part Numbers: Sockets

Relays	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel Mount	Springs & Clips (optional)	
				Part Numbers	Use With Socket
RR2P	SR2P-05 SR2P-06	SR2P-05C	SR2P-51	SR2B-02F1	SR2P-05, -05C, -06
				SR3P-01F1	SR2P-51, SR3P-51
RR3PA	SR3P-05 SR3P-06	SR3P-05C	SR3P-51	SR3B-02F1	SR3P-05, -05C, -06 SR3B-05, -51
				SR3P-01F1	SR3P-51
RR1BA RR2BA RR3B	SR3B-05	—	SR3B-51	SR3B-02F1	SR3B-05 SR3B-51



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

## Internal Circuits

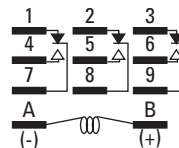
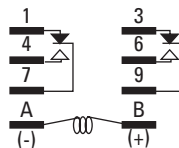
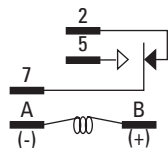
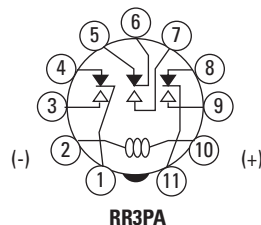
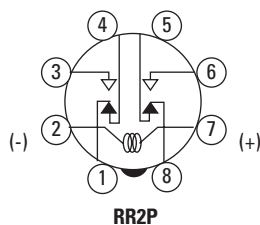
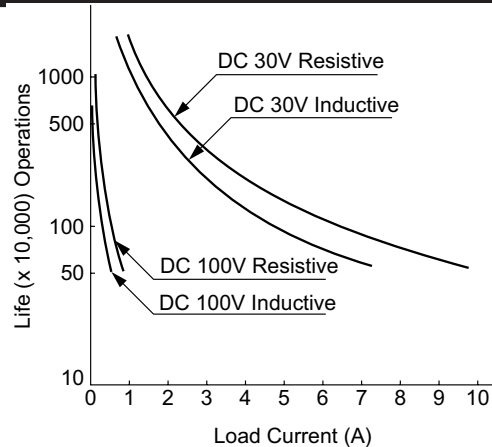
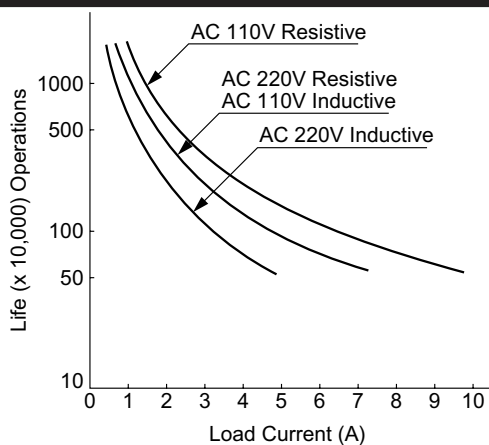
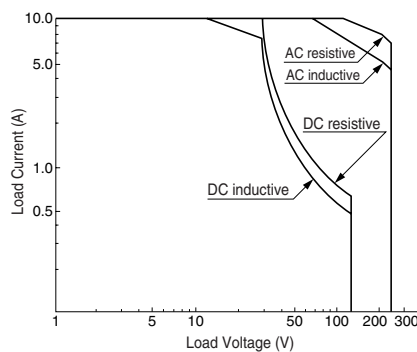


Image as viewed from bottom of relay. Refer to socket for exact wiring layout (Section F).

## Electrical Life Curves



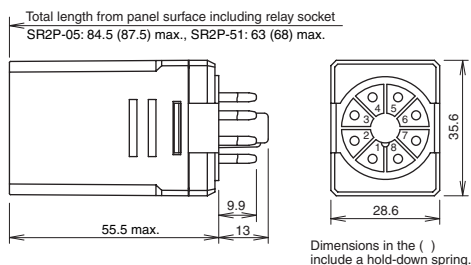
## Maximum Switching Capacity



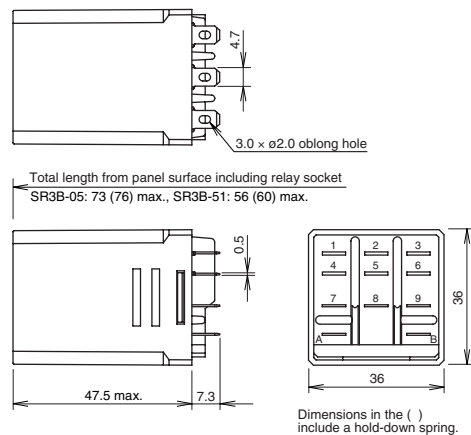


## **Dimensions**

### **8-Pin RR2P**

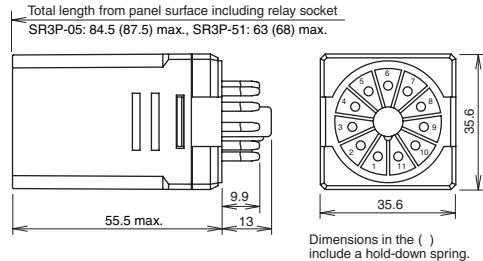


### **Blade RR1BA, RR2BA, RR3B**

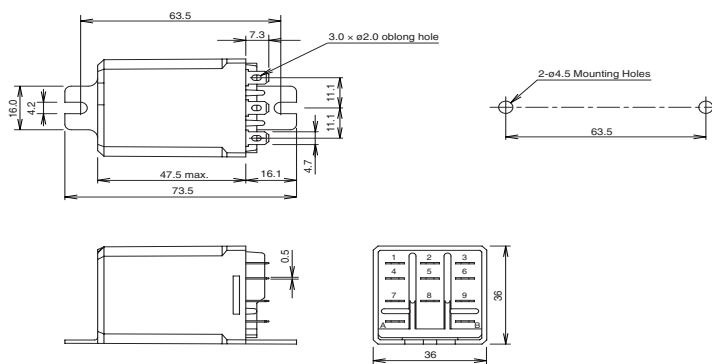


**Note:** Dimensions in [ ] include hold-down spring.

### **11-Pin RR3PA**



### **Side Flange RR1BA-US, RR2BA-US, RR3B-US**

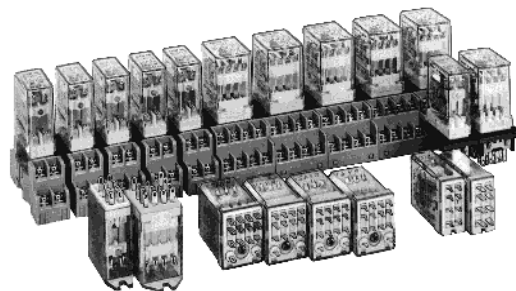


All dimensions in mm.

## RY/RM Series — General Purpose Miniature Relays

Key features of the RY series include:

- Compact miniature size saves space
- 2PDT and 4PDT models, available with bifurcated crossbar contacts, ensure reliable low-current switching for dry circuit applications
- Choice of plug-in/solder or PCB type terminals
- Options include check button for test operation and indicator lights
- DIN rail, surface, panel, and PCB type sockets available for a wide range of mounting applications



E

Relays

Specifications

Contact Material	RY2, RY4: Silver (Ag), gold-plated RY22, RY42: Ag-Pd alloy RM: Silver (Ag)
Contact Resistance	RY2, RY4: 50mΩ maximum RY22, RY42: 100mΩ maximum RM: 30mΩ maximum
Minimum Applicable Load	RY2, RY4: 5V DC, 10mA/24V DC, 5mA RM2: 24VDC/10mA, 5VDC/20mA (reference value) Bifurcated contacts: RY22, RY42: 1V DC, 100μA (reference value)
Operating Time	20ms maximum
Release Time	20ms maximum
Maximum Continuous Applied Voltage (AC/DC) at 20°C	110% of the rated voltage
Minimum Operating Voltage (AC/DC) at 20°C	80% of the rated voltage
Drop-Out Voltage (AC)	30% or more of the rated voltage
Drop-Out Voltage (DC)	10% or more of the rated voltage
Power Consumption	RY2, RY22: DC: approximately 0.8W AC: approximately 1.1VA (50Hz), 1VA (60Hz) RY4, RY42, RM2: DC: approximately 0.9W AC: approximately 1.4VA (50Hz), 1.2VA (60Hz)
Insulation Resistance	100MΩ minimum (measured with 500V DC megger)
Dielectric Strength	RY2, RY22: Between live and dead parts: 1,500V AC, 1 minute; Between contact and coil: 1,500V AC, 1 minute; Between contacts of different poles: 1,500V AC, 1 minute; Between contacts of the same pole: 1,000V AC, 1 minute RY4, RY42, RM2: Between live and dead parts: 2,000V AC, 1 minute; Between contact and coil: 2,000V AC, 1 minute; Between contacts of different poles: 2,000V AC, 1 minute; Between contacts of the same pole: 1,000V AC, 1 minute
Frequency Response	1,800 operations/hour
Temperature Rise	Coil: 85°C maximum Contact: 65°C maximum
Vibration Resistance	0 to 6G (55Hz maximum)
Shock Resistance	RY2, RY22: 100N (approximately 10G) RY4, RY42, RM2: 200N (approximately 20G)
Life Expectancy	Electrical RY2, RY4: over 200,000 operations (120V, 3A) RY22, RY42: over 200,000 operations (120V AC, 1A) RM2: over 500,00 operations (240V AC, 5A)
	Mechanical over 50,000,000 operations
Operating Temperature	-30 to +70°C
Weight	DPDT: 23g; 4PDT: 34g (approximately)



UL Recognized  
File No. E55996



CSA Certified  
File No. LR35144



File No. B020813332452



## Ordering Information

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

Basic Part No.

RY4S-U

Coil Voltage:

AC110-120V

## Part Numbers

### Part Numbers: RY/RM Series with Options

Termination	Contact Configuration	Basic Part No.	Indicator Light	Check Button	Indicator Light and Check Button	Top Bracket
S Solder/plug-in	DPDT small footprint	RY2S-U	RY2S-UL	RY2S-UC	RY2S-ULC	RY2S-UT
	DPDT (bifurcated contacts)	RY22S-U	RY22S-UL	—	—	RY22S-UT
	DPDT wide footprint	RM2S-U	RM2S-UL	RM2S-UC	RM2S-ULC	RM2S-UT
	4PDT	RY4S-U	RY4S-UL	RY4S-UC	RY4S-ULC	RY4S-UT
	4PDT (bifurcated contacts)	RY42S-U	RY42S-UL	RY42S-UC	RY42S-ULC	RY42S-UT
V PCB 0.031" (0.8mm) wide	DPDT small footprint	RY2V-U	RY2V-UL	RY2V-UC	RY2V-ULC	—
	DPDT (bifurcated contacts)	RY22V-U	RY22V-UL	—	—	—
	DPDT wide footprint	RM2V-U	RM2V-UL	RM2V-UC	RM2V-ULC	—
	4PDT	RY4V-U	RY4V-UL	RY4V-UC	RY4V-ULC	—
	4PDT (bifurcated contacts)	RY42V-U	RY42V-UL	RY42V-UC	RY42V-ULC	—

E

Relays

## Ratings

### Coil Ratings

Rated Voltage (V)		Rated Current ±15% at 20°C				Coil Resistance ±10% at 20°C		Coil Inrush (60Hz)		Coil Inductance			
		60Hz		50Hz						Energizing		De-Energizing	
AC		RY2, RY22	RM2, RY4, RY42	RY2, RY22	RM2, RY4, RY42	RY2, RY22	RM2, RY4, RY42	RY2, RY22	RM2, RY4, RY42	RY2, RY22	RM2, RY4, RY42	RY2, RY22	RM2, RY4, RY42
	6V	150mA	200mA	170mA	240mA	18.8Ω	9.4Ω	250mA	340mA	0.09H	0.08H	0.06H	0.04H
	12V	75mA	100mA	86mA	121mA	76.8Ω	39.3Ω	120mA	170mA	0.37H	0.30H	0.22H	0.16H
	24V	37mA	50mA	42mA	60.5mA	300Ω	153Ω	56mA	85mA	1.5H	1.2H	.9H	0.63H
	120V*	7.5mA	11mA	8.6mA	13.1mA	7,680Ω	4,170Ω	12mA	16mA	37H	33H	22H	15H
	240V †	3.2mA	5.5mA	3.7mA	6.6mA	31,200Ω	15,210Ω	7mA	8mA	130H	130H	77H	62H
DC		RY2, RY22		RM2, RY4, RY42		RY2, RY22	RM2, RY4, RY42	N/A					
	6V	128mA		150mA		47Ω	40Ω						
	12V	64mA		75mA		188Ω	160Ω						
	24V	32mA		36.9mA		750Ω	650Ω						
	48V	18mA		18.5mA		2,660Ω	2,600Ω						
	110V‡	—		9.1mA		—	12,100Ω						



\* For RY4/RY42/RM2 relays = AC110/120V AC.

† For RY4/RY42/RM2 relays = 220/240V AC.

‡ For RY4/RY42/RM2 relays = 100/110V DC.

### Contact Ratings (gold plated) RY4, RY2

Voltage	Contact	Resistive		Inductive	
		UL	CSA	UL	CSA
30V DC	DPDT	3A	3A	3A	1.5A
	4PDT	5A	5A	5A	1.5A
100V DC	DPDT	0.2A	—	0.2A	0.2A
	4PDT	0.2A	—	0.2A	0.2A
120V AC	DPDT	3A	3A	1.5A	1.5A
	4PDT	5A	5A	5A	5A
240V AC	DPDT	3A	3A	0.8A	0.8A
	4PDT	5A	5A	5A	5A

### Contact Ratings (bifurcated) RY42, RY22

Voltage	Resistive UL/CSA	Inductive UL/CSA
30V DC	1A	0.5A
120V AC	1A	0.5A
240V AC	0.8A	0.4A

### Contact Ratings RM2

Voltage	Resistive			Inductive		
	Nominal	UL	CSA	Nominal	UL	CSA
30V DC	5A	5A	5A	2.5A	—	2.5A
110V DC	0.4A	0.4A	—	0.4A	—	0.4A
120V AC	5A	5A	5A	2.5A	2.5A	2.5A
240V AC	5A	5A	5A	2A	2A	2A

Applicable Sockets

Part Numbers: Sockets

Relay	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel Mount	PC Mount
RY2S RY22S	SY2S-05	SY2S-05C	SY2S-51	SY2S-61
RM2	SM2S-05	SM2S-05C	SM2S-51	SY4S-61 SY4S-62
RY4S RY42S	SY4S-05	SY4S-05C	SY4S-51	

Springs (optional)	
Part Number	Use With
SY2S-02F1③ SFA-101① SFA-202②	SY2S-05, -05C
SFA-301① SFA-302② SY4S-51F1③	SY2S-51, -61
SY4S-02F1③ SFA-101① SFA-202②	SY2S-05, -05C
SFA-301① SFA-302② SY4S-51F1③	SY4S-51, -61



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



- ① Top latch
- ② Side latch
- ③ Pullover spring

E

Relays

Internal Circuits

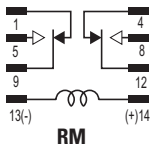
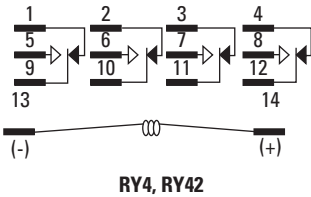
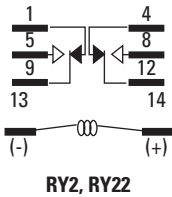
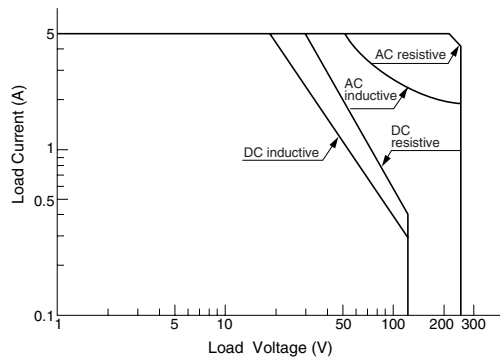


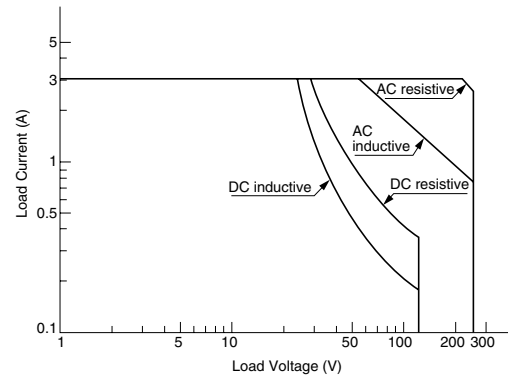
Image as viewed from bottom of relay. Refer to socket for exact wiring layout (Section F).

## Maximum Switching Capacity

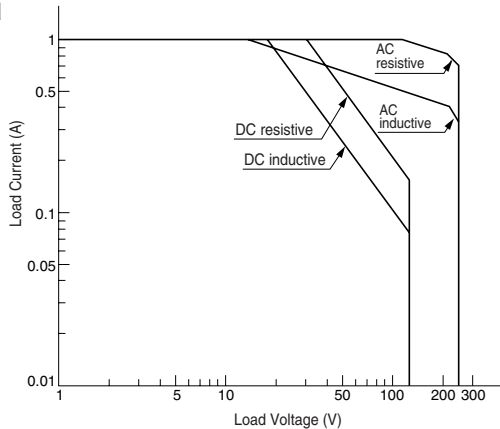
RY4/RM2



RY2

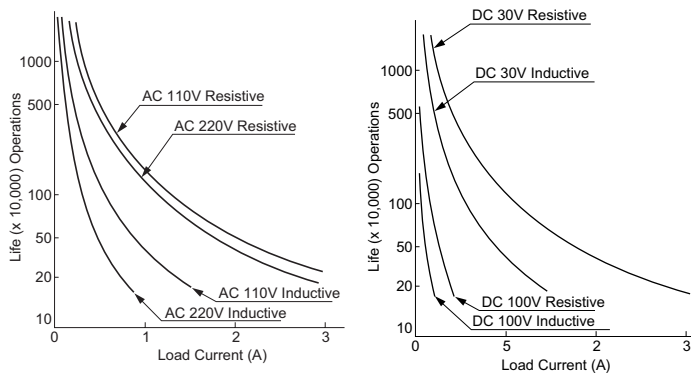


RY Bifurcated

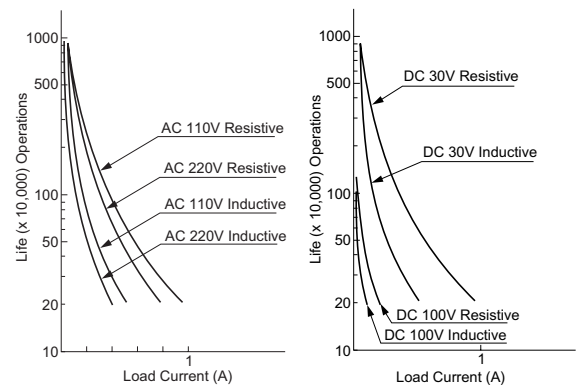


## Electrical Life Curves

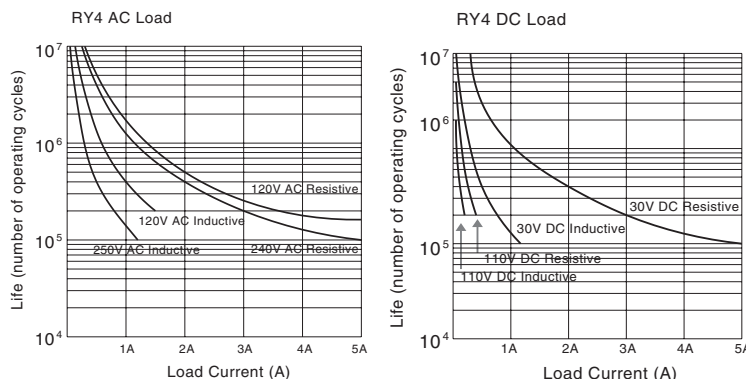
RY2



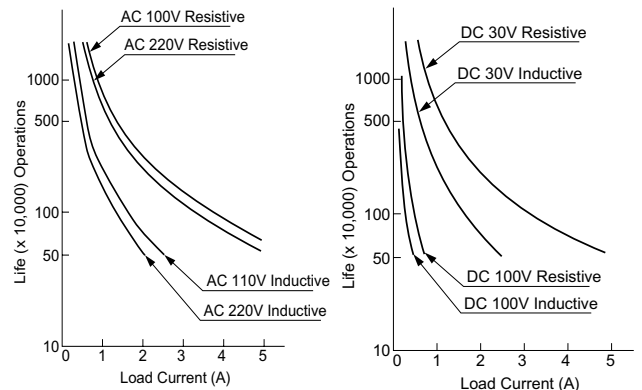
Bifurcated Contacts RY42, RY22



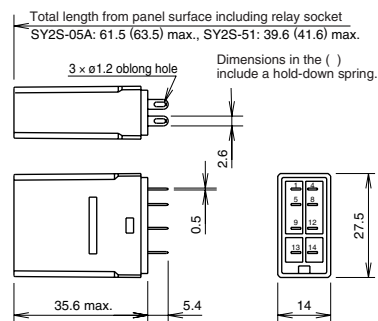
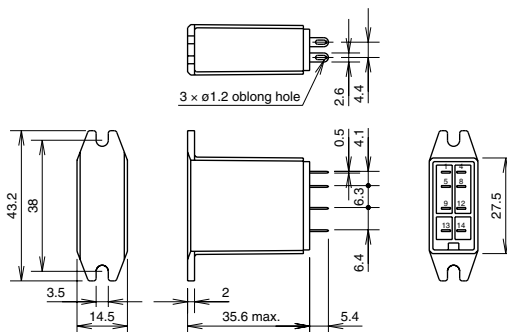
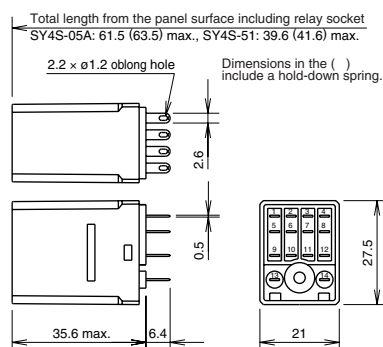
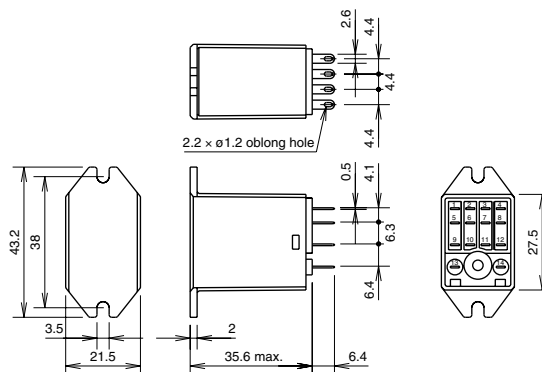
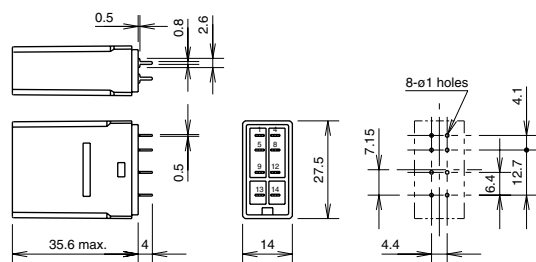
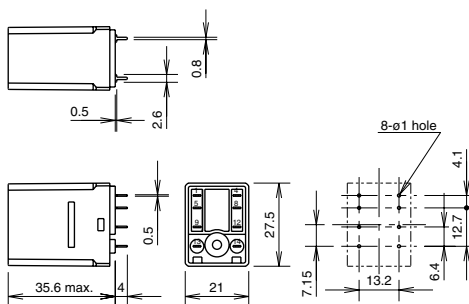
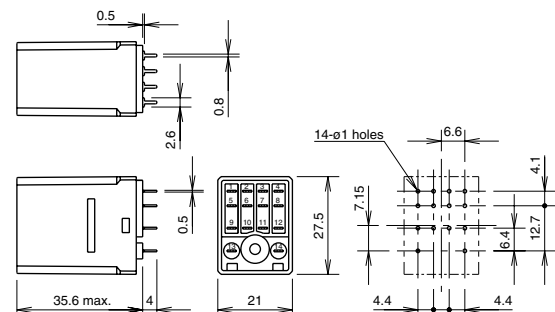
RY4



RM2



## Dimensions

**Solder Terminal  
Plug-in  
RY2S  
RY22S****With Top Bracket  
Plug-in  
RY2S-UT, RY22S-UT****RY4S  
RY42S****RY4S-UT  
RY42S-UT****PCB Terminal  
RY2V  
RY22V****PCB Terminal  
RM2S, RM2V****PCB Terminal  
RY4V, RY42V**

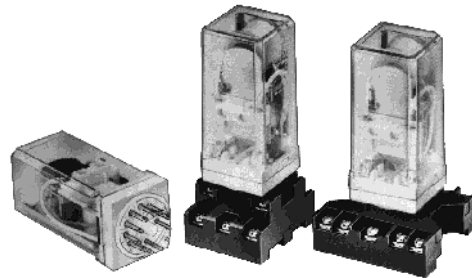
All dimensions in mm.



## RR2KP Series — Magnetic Latching Relays

### Key features of the RR2KP series include:

- Standard octal base (11-pin) termination
- Operates by pulse input and maintains condition even during power failure
- Coils rated for continuous duty
- High vibration and shock resistance
- Excellent self-holding performance (magnetic latch)
- Optional manual check button for circuit testing
- DIN rail, surface, and panel mount sockets available for a wide range of mounting applications



Specifications	Contact Material	Silver
	Contact Resistance	30mΩ maximum (initial value)
	Minimum Applicable Load	5V DC, 100mA
	Operating Time	25ms maximum
	Maximum Continuous Applied Voltage (AC/DC) at 20°C	110% of the rated voltage without overheating
	Minimum Set and Reset Voltage at 20°C	80% of the rated voltage
	Power Consumption	AC: approximately 2.4VA (50Hz), 2.2VA (60Hz) DC: approximately 1.5W
	Insulation Resistance	100MΩ minimum (with 500V DC megger)
	Dielectric Strength	Between live and dead parts: 1,500V AC, 1 minute Between contact circuit and opposite coil: 1,500V AC, 1 minute Between contact circuits: 1,500V AC, 1 minute (1,000V between NO-NC contacts)
	Frequency Response	1,800 operations/hour
	Temperature Rise	Coil: 85°C maximum; Contact: 65°C maximum
	Vibration Resistance	0 to 6G (55Hz maximum)
	Shock Resistance	100N (approximately 10G)
	Life Expectancy	Electrical: over 500,000 operations (120V, 10A) Mechanical: over 5,000,000 operations
	Operating Temperature	−30 to +70°C
	Weight	170g (approximately)


 UL Recognized  
File No. E66043

 CSA Certified  
File No. LR35144

### Ordering Information

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

**Basic Part No.**
**RR2KP-U**
**Coil Voltage:**
**AC120V**
**E**

Relays

## Part Numbers

## Part Numbers: RR2KP Series

Termination	Contact Configuration	Standard	With Check Button
P: 11-Pin	DPDT	RR2KP-U	RR2KP-UC

## Ratings

## Coil Ratings

		Rated Current $\pm 15\%$ at 20°C		
Rated Voltage		60Hz	50Hz	Coil Resistance $\pm 10\%$ at 20°C
AC	6V	429mA	467mA	3.5Ω
	12V	184mA	200mA	23.8Ω
	24V	92mA	100mA	95Ω
	120V	22mA	24mA	2,200Ω
	240V	10.6mA	11.5mA	9,190Ω
DC	6V	240mA		25Ω
	12V	120mA		100Ω
	24V	60mA		400Ω
	48V	30mA		1,600Ω
	110V	13.8mA		7,960Ω

## Contact Ratings

Voltage	Resistive			Inductive		
	Nominal	UL	CSA	Nominal	UL	CSA
30V DC	10A	10A	10A	7.5A	7A	7.5A
100V DC	0.5A	—	—	0.5A	—	0.5A
120V AC	10A	10A	10A	7.5A	7.5A	7.5A
240V AC	7.5A	10A	10A	5A	7A	7A



2. Inductive load  $\cos \phi = 0.3$ ,  $L/R = 7\text{ms}$ .

3. UL/CSA motor load rating 1/4 HP at 120V AC and 1/3 HP at 240V AC.

## Applicable Sockets

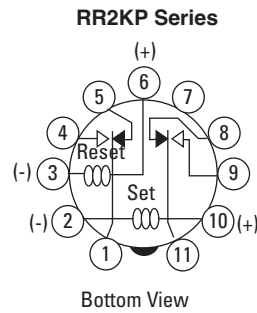
## Part Numbers: Sockets

Relay	Snap DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel	Springs (optional)
RR2KP	SR3P-05 SR3P-06	SR3P-05C	SR3P-51	SR3P-06F3 SR3P-51F3



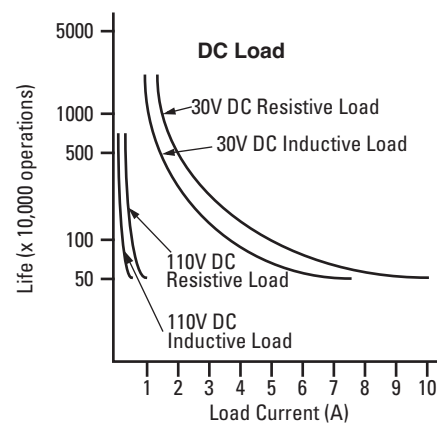
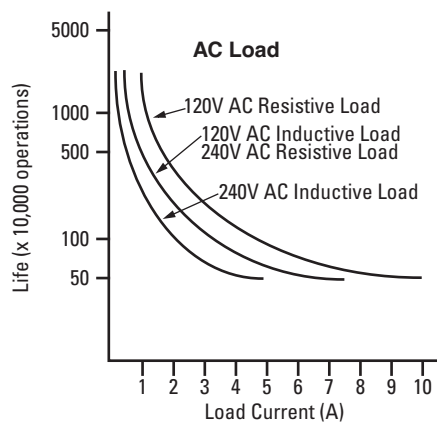
1. See Section F for details on sockets. All DIN rail mount sockets shown above can be mounted using DIN rail BNDN1000.

## **Internal Circuit**



Shown in reset (unlatched) position.

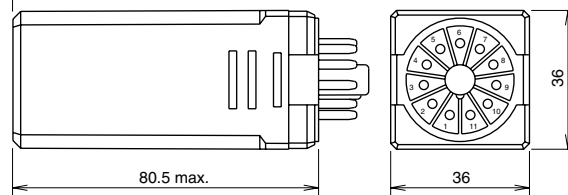
## **Electrical Life Curves**



## **Dimensions**

**Plug-in  
RR2KP**

Total length from panel surface including relay socket  
SR3P-05A: 105 (108.5) max., SR3P-511: 87.5 (92) max.

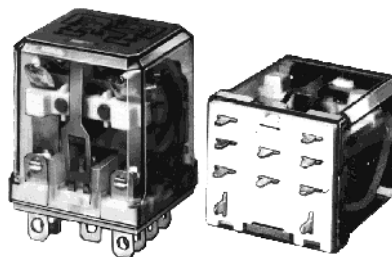


All dimensions in mm.

**RH2L Series — Magnetic Latching Relays**

Key features of the RH2L series include:

- Compact miniature size saves board space
- Power-saving operation by pulse inputs eliminates the need for continuous control voltage
- Coils rated for continuous duty
- Built-in mechanical indicator to show set/reset condition
- Available with blade and PC mount terminals
- DIN rail, surface, panel, and PCB type sockets available for a wide range of mounting applications
- Excellent self-holding performance (magnetic latching)

**E****Relays****Specifications**

<b>Contact Material</b>	Silver cadmium oxide
<b>Contact Resistance</b>	50mΩ or less (initial value)
<b>Minimum Applicable Load</b>	5V DC, 100mA
<b>Operating Time</b>	30ms (AC); 20 ms (DC)
<b>Maximum Continuous Applied Voltage (AC/DC)</b>	110% of rated voltage
<b>Minimum Set and Reset Voltage at 20°C</b>	80% of rated voltage
<b>Set Time</b>	30ms or less (AC); 20ms or less (DC)
<b>Reset Time</b>	30ms or less (AC); 20ms or less (DC)
<b>Power Consumption</b>	Set coil: AC: approximately 1.2V; DC: approximately 2W Reset coil: approximately 0.5VA; DC: approximately 0.9W
<b>Insulation Resistance</b>	100MΩ minimum
<b>Dielectric Strength</b>	Between live and dead parts: 2,000V AC, 1 minute Between contact circuit and opposite coil: 2,000V AC, 1 minute Between contact circuits: 1,500V AC, 1 minute Between contacts of same pole: 1,000V AC, 1 minute
<b>Frequency Response</b>	1,800 operations/hour
<b>Vibration Resistance</b>	60N (approximately 6G) Maximum frequency 55Hz
<b>Shock Resistance</b>	100N or more (approximately 10G)
<b>Life Expectancy</b>	Electrical: over 200,000 operations Mechanical: over 10,000,000 operations
<b>Operating Temperature</b>	–30 to +70°C
<b>Weight</b>	50g



UL Recognized  
File No. E66043



CSA Certified  
File No. LR35144

**Ordering Information**

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

**Basic Part No.**  
**RH2LB-U**

**Coil Voltage:**  
**AC120V**

## Part Numbers

### Part Numbers: RH2L Series

Termination	Contact Configuration	Part No.
B: Blade	DPDT	RH2LB-U
V2: PCB - 0.079" (2mm)	DPDT	RH2LV2-U

## Ratings

### Coil Ratings

Rated Voltage	Set Coil				Reset Coil		
	Rated Current $\pm 15\%$ at 20°C		Coil Resistance $\pm 10\%$ at 20°C		Rated Current $\pm 15\%$ at 20°C		Coil Resistance $\pm 10\%$ at 20°C
	60Hz	50Hz			60Hz	50Hz	
AC	6V	220mA	227mA	8.8 $\Omega$	68mA	68.7mA	6.9 $\Omega$
	12V	100mA	103mA	41.6 $\Omega$	34mA	34.2mA	30.2 $\Omega$
	24V	50mA	51.2mA	182 $\Omega$	17.1mA	17.1mA	105 $\Omega$
	120V	10mA	10.3mA	4,670 $\Omega$	4.2mA	4.2mA	2,680 $\Omega$
DC	6V	333mA		18 $\Omega$	150mA		40 $\Omega$
	12V	167mA		72 $\Omega$	75mA		160 $\Omega$
	24V	83mA		288 $\Omega$	37.5mA		640 $\Omega$
	48V	42mA		1,150 $\Omega$	18.8mA		2,560 $\Omega$

### Contact Ratings

Voltage	Resistive		Inductive		Motor Load	
	UL	CSA	UL	CSA	UL	CSA
30V DC	10A	10A	—	7.5A	—	—
120V AC	10A	10A	7.5A	7.5A	1/6HP	1/6HP
240V AC	7.5A	7.5A	6.5A	5A	1/3HP	1/3HP

## Applicable Sockets

### Part Numbers: Sockets

Relay	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel Mount	PC Mount	Springs (optional)
RH2LB	SH3B-05	SH3B-05C	SH3B-51	SH3B-62	SFA-101 SY4S-51F1



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

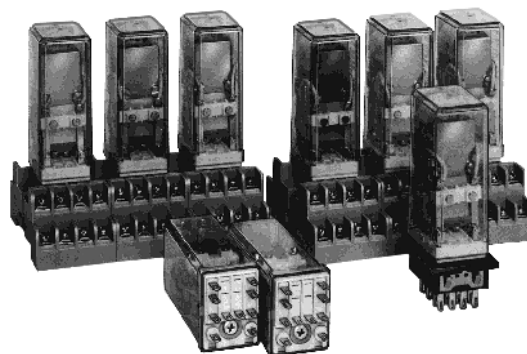




## RY2KS Series — Miniature Magnetic Latching Relays

Key features of the RY2KS series include:

- Standard “ice cube” base, solder lug (14-pin) termination
- Operates by pulse input and maintains condition even during power failure
- High vibration and shock resistance
- Excellent self-holding performance
- Optional manual check button for circuit testing
- DIN rail, surface, and panel mount sockets available for a wide range of mounting applications



Specifications	Contact Material	Silver, gold-plated
	Contact Resistance	50mΩ maximum (initial value)
	Minimum Applicable Load	5V DC, 100mA
	Operating Time	25ms maximum
	Release Time	25ms maximum
	Maximum Continuous Applied Voltage (AC/DC) at 20°C	110% of the rated voltage
	Set and Reset Voltages (AC/DC) at 20°C	80% of the rated voltage
	Power Consumption	AC: approximately 1.6V (50Hz), 1.5VA (60Hz) DC: approximately 1.2W
	Insulation Resistance	100MΩ minimum (with 500V DC megger)
	Dielectric Strength	Between live and dead parts: 1,500V AC, 1 minute Between contact circuit and opposite coil: 1,000V AC, 1 minute Between contact circuits: 1,000V AC, 1 minute (700V between NO-NC contacts)
	Frequency Response	1,800 operations/hour
	Temperature Rise	Coil: 85°C maximum Contact: 65°C maximum
	Vibration Resistance	0 to 6G (55Hz maximum)
	Shock Resistance	20G minimum
	Life Expectancy	Electrical: over 200,000 operations (240V AC, 3A) Mechanical: over 5,000,000 operations
	Operating Temperature	–30 to +70°C
	Weight	67g (approximately)



UL Recognized  
File No. E55996



CSA Certified  
File No. LR35144

**E**  
Relays

### Ordering Information

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

Basic Part No.	Coil Voltage:
RY2KS-U	AC120V

**Part Numbers**
**Part Numbers: RY2KS Series**

Termination	Contact Configuration	Standard	With Check Button
S: Solder/plug-in	DPDT	RY2KS-U	RY2KS-UC

**Ratings**
**Coil Ratings**

Rated Voltage		Rated Current $\pm 15\%$ at 20°C		Coil Resistance $\pm 10\%$ at 20°C
		60Hz	50Hz	
AC	6V	250mA	260mA	6.3Ω
	12V	115mA	120mA	30.3Ω
	24V	56mA	58mA	132Ω
	120V	10.8mA	11.2mA	3,840Ω
DC	6V	200mA		30Ω
	12V	100mA		120Ω
	24V	50mA		480Ω
	48V	25mA		1,920Ω
	110V	11mA		10,000Ω

**Contact Ratings**

Voltage	Resistive			Inductive		
	Nominal	UL	CSA	Nominal	UL	CSA
30V DC	3A	3A	3A	1.5A	—	1.5A
100V DC	0.2A	—	—	0.12A	—	0.2A
120V AC	3A	3A	3A	1.5A	1.5A	1.5A
240V AC	3A	3A	3A	0.8A	0.8A	0.8A

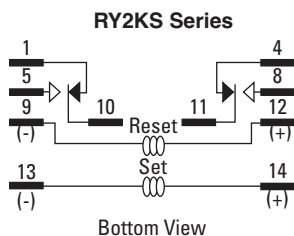
2. Inductive load  $\cos \phi = 0.3$ ,  $L/R = 7ms$ .

**Applicable Sockets**
**Part Numbers: Sockets**

Relay	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel Mount	PC Mount	Spring (optional)
RY2KS	SY4S-05	SY4S-05C	SY4S-51	SY4S-61 SY4S-62	SFA-202 SY4S-51F3

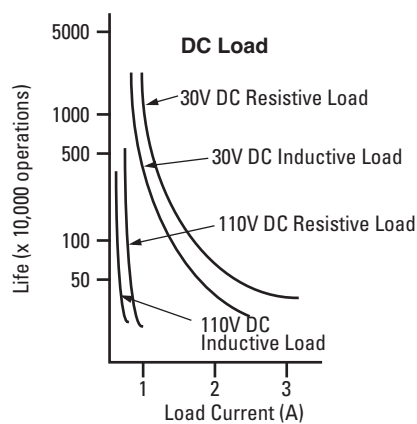
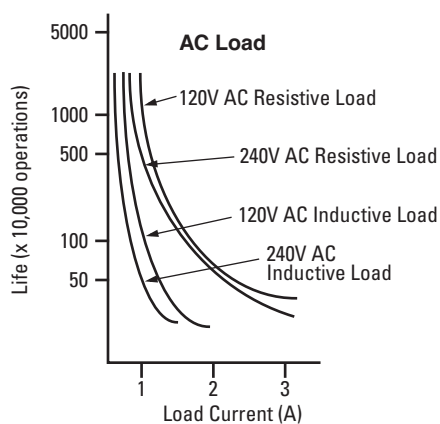
1. See Section F for details on sockets. All DIN rail mount sockets shown above can be mounted using DIN rail BNDN1000.

## Internal Circuits



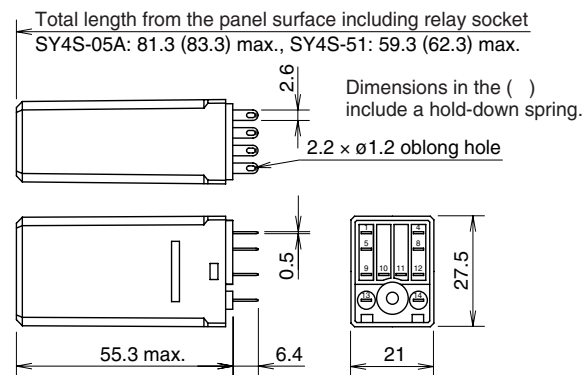
Shown in reset (unlatched) position.

## Electrical Life Curves



## Dimensions

### Plug-in RY2KS



All dimensions in mm.

## RSS Series — Panel Mount Solid State Relays

Key features of the RSS series include:

- Input status LED Indicator
- Dual SCR output
- Direct bond copper substrate
- Internal transient protection – built-in snubber
- EMC compliant (level 3)
- Photo isolation
- 1200 volt blocking voltage
- 4000 volt optical isolation
- Zero voltage turn-on
- 100% tested at rated current
- High surge capability
- Optional finger-safe terminal cover (RSS-CVR)



**10, 25, 50, 75, 90A Current Ratings**  
**48V AC to 660V AC Output Ratings**

Relays

**cULus** UL Recognized  
 File No. E194577



Input Specifications	Series	RSSDN	RSSAN
	Voltage Range	4 to 32V DC	90 to 280V AC
	Input Current	current regulated (10mA)	
	Pick Up Voltage	4V DC	90V AC
	Drop Out Voltage	1V DC	10V AC
	Dielectric Strength (Input-Output-Base)	4000 RMS (min)	4000 RMS (min)
	Capacitance (Input to Output)	8pF	8pF
	Rev. Voltage Protection	Yes (-32VDC)	N/A

Output Specifications	Current (continuous)	10A	25A	50A	75A	90A
	1-Cycle Surge Current	150A	300A	750A	1000A	1200A
	1-Second Surge Current	30A	75A	150A	225A	300A
	Minimum Holding Current	50mA	50mA	100mA	100mA	100mA
	Voltage Drop at Rated Current	1.6V (maximum)				
	Voltage Range	48 - 660V AC				
	Contact	1 Form A (SPST-NO)				
	Over Voltage Rating	1200 PIV				
	Frequency Range	47 to 80Hz				
	Off-State Leakage at Rated Voltage	20mA (maximum)				
	Turn-On Time	1/2 cycle @ 60Hz				
	Turn-Off Time	1/2 cycle @ 60Hz				
	Zero Voltage Switching	Yes				
	Static DV/DT	200V/μsec				
	Commutating DV/T	Snubbed for 0.5 power factor at rated load				
	Weight	10g (approx.)				

## Part Numbers

## Part Numbers: RSS Series

Continuous Output Current	DC Input	AC Input
10A	RSSDN-10A	RSSAN-10A
25A	RSSDN-25A	RSSAN-25A
50A	RSSDN-50A	RSSAN-50A
75A	RSSDN-75A	RSSAN-75A
90A	RSSDN-90A	RSSAN-90A



The fingersafe cover is part no. RSS-CVR.

## **Recommended Loads**

### **Transformer Loads**

Transformer loads sometimes result in severe inrush current when the transformer saturates during the first cycle. Use a relay rated for this surge, which has a 1/2 cycle surge current greater than the maximum applied line voltage ÷ the transformer's primary resistance (approximately 10x rated current).

#### **Recommended Loads**

SSR Rating	at 120V AC	at 240V AC
2A	150VA	300VA
4A	200VA	400VA
10A	500VA	1KVA
25A	1KVA	2KVA
50A	2KVA	4KVA

### **Heater Loads**

When using solid state relays for driving heaters where the load is switched on and off rapidly and continuously, severe thermal stress will result. In such cases, use an SSR relay at no more than 75% of the rating.

#### **Recommended Loads**

SSR Rating	at 120V AC	at 240V AC
2A	250W	500W
4A	400W	800W
10A	1KW	2KW
25A	2KW	4KW
50A	3KW	6KW

### **Solenoid Valves and Contactors**

RSS relays use high-noise immunity circuitry with a snubber to handle the electrical noise generated by inductive loads.

#### **Recommended Loads**

SSR Rating	at 120V AC	at 240V AC
2A	250W	500W
4A	400W	800W
10A	900W	1,800W
25A	2,100W	4,200W
50A	3,800W	7,500W

RSS series relays provide a highly reliable means of switching AC loads when applied properly. Read the following technical notes prior to installing IDEC's quality solid state relays.

### **UL Motor Load Ratings (HP Ratings)**

Part Number	120V	240V	480V
10A	1/2	3/4	3/4
25A	1/2	3/4	3/4
50A	3/4	1 1/2	1 1/2
75A	3/4	5	5
90A	3/4	5	5

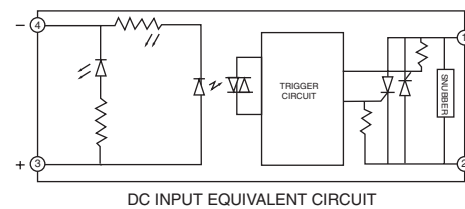
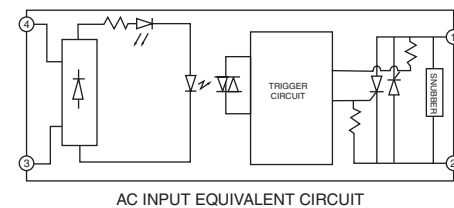
### **Lamp Loads**

Zero voltage switching is ideal for driving incandescent lamps, since the cold filament will not be subjected to a large inrush current. Using a zero-switched SSR will reduce inrush current and prolong lamp life.

#### **Recommended Loads**

SSR Rating	at 120V AC	at 240V AC
2A	2A	2A
4A	3A	3A
10A	1KW	2KW
25A	2KW	4KW
50A	3KW	6KW

### **Internal Circuit Block Diagram**



Technical Notes

Environment

Do not install SSRs near sources of excessive heat. Make sure applications are dry and well ventilated.

If SSRs must be installed in an environment subject to high temperatures or poor ventilation, or if SSRs are mounted collectively, reduce the load current so that it does **not** approach the ambient temperature-load current recommendation. (See the Temperature Derating Curves on the following page.)

When SSRs are used with inductive loads, suppress the inrush current to half of the peak surge current.

Heat Sinks

Heat sinks are recommended for 10, 25, 50, 75, and 90 amp rated solid state relays depending on ambient temperature and mounting position. The recommended heat sink dimensions and material are shown in the table:

Output Rating	Dimensions	Material
10A	12" x 12" x 1/8"	Aluminum (black anodized)
25A	12" x 12" x 1/8" (DC/AC)	Aluminum (black anodized)
25A	15" x 15" x 1/8" (AC/AC)	Aluminum (black anodized)
50A	15" x 15" x 1/8"	Aluminum (black anodized)
75A	17" x 17" x 1/8"	Aluminum (black anodized)
90A	17" x 17" x 1/8"	Aluminum (black anodized)

Using a thermal compound between the base of the SSR and the heat sink for heat dissipation is recommended.

Wiring

Locate SSRs as far from motor leads as possible to prevent malfunction from induced current.

Use shielded wires for input leads when they are exposed to a source of induced current.

Mounting

Provide sufficient ventilation.

Use #6 – 32 screws, flat washers, and lock washers to secure mounting on heat sinks.

Vertical mounting is recommended to allow air to flow unimpeded. Horizontal or inverted mounting is possible, but the SSR must be derated according to the derating curves on the following page.

Additional Information

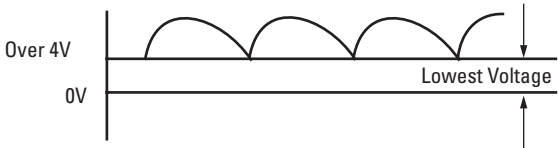
Do not exceed the load voltage and current specifications.

A small-capacity load may not turn off due to the leakage current present after the SSR has turned off. If this is the case, use a resistor in parallel with the load to shunt the leakage current.

Observe the polarity of input terminals. Failure to do so may cause damage to the SSR.

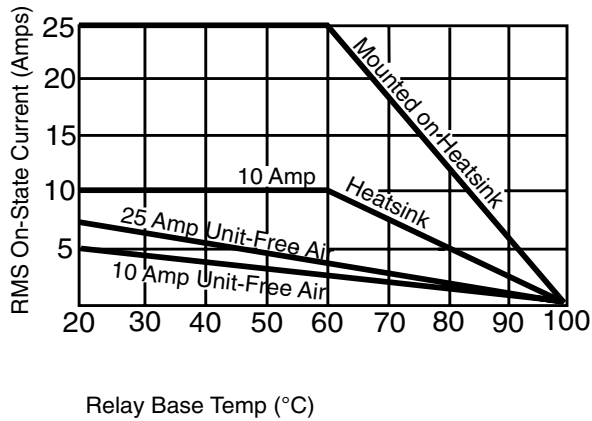
When the SSR output is subjected to a higher than rated voltage, a varistor or other element should be connected to the output terminals to absorb the over-voltage.

When the input signal contains a ripple voltage, the lowest ripple amplitude should exceed the minimum pick-up voltage of 4V.

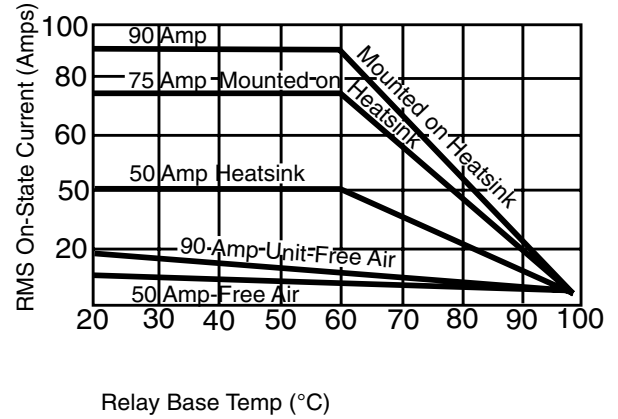


## Temperature Derating Curves: RSS Series

Derating Curve  
10-Amp and 25-Amp



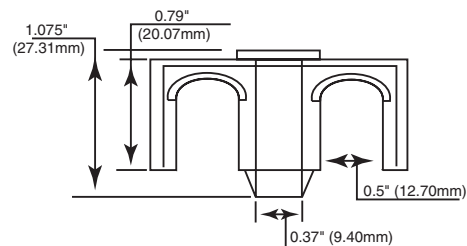
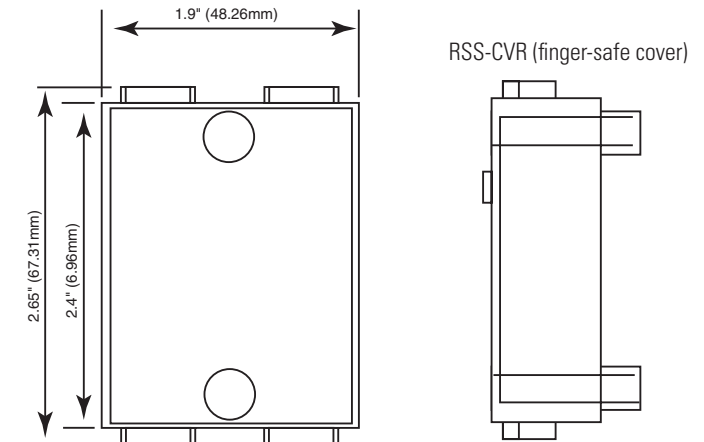
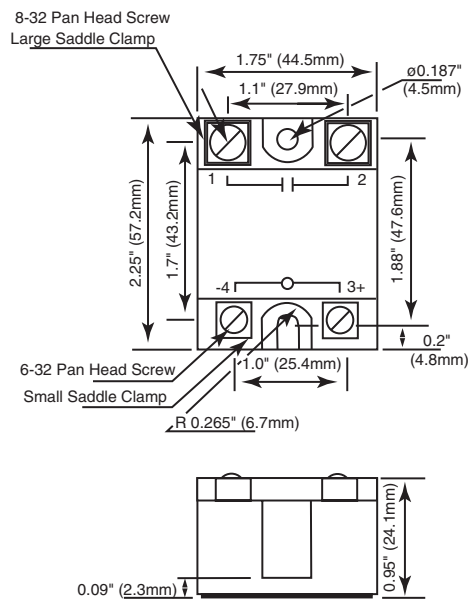
Derating Curve  
50-Amp, 75-Amp, and 90-Amp



For information on heat sink size, refer to the Technical Notes on the previous page.

## RSS Dimensions

### RSS Series



Material: Polycarbonate-Clear

All dimensions in mm.

