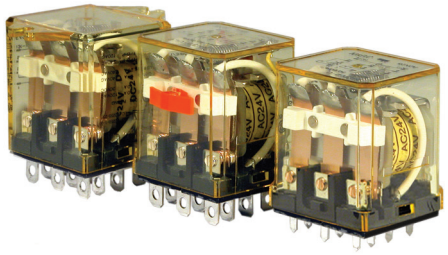
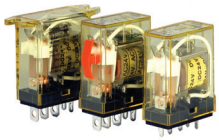
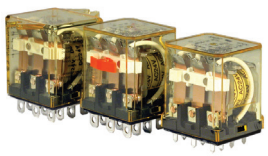
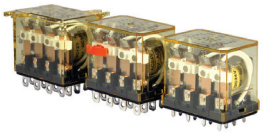
# RH Series Compact Power Relays

## Key features

- SPDT through 4PDT, 10A contacts
- Compact power type relays
- Miniature power relays with a large capacity
- 10A contact capacity
- Compact size saves space



## Part Number Selection

| Contact | Model | Part Number: Blade Terminal | Part Number: PCB Terminal | Coil Voltage Code (Standard Stock in bold) |
|---|---|---|---|---|
| SPDT  | Standard | RH1B-U ☐ | RH1V2-U ☐ | AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V |
| | With Indicator | RH1B-UL ☐ | — | |
| | With Check Button | RH1B-UC ☐ | — | |
| | With Indicator and Check Button | RH1B-ULC ☐ | — | |
| | Top Bracket Mounting | RH1B-UT ☐ | — | |
| | With Diode (DC coil only) | RH1B-UD ☐ | RH1V2-UD ☐ | DC6V, **DC12V**, **DC24V**, DC48V, DC110V |
| | With Indicator and Diode (DC coil only) | RH1B-ULD ☐ | — | **DC12V**, **DC24V**, DC48V, DC110V |
| DPDT  | Standard | RH2B-U ☐ | RH2V2-U ☐ | AC6V, AC12V, **AC24V**, **AC110-120V**, **AC220-240V** DC6V, **DC12V**, **DC24V**, DC48V, DC100-110V |
| | With Indicator | RH2B-UL ☐ | RH2V2-UL ☐ | |
| | With Check Button | RH2B-UC ☐ | — | |
| | With Indicator and Check Button | RH2B-ULC ☐ | — | |
| | Top Bracket Mounting | RH2B-UT ☐ | — | |
| | With Diode (DC coil only) | RH2B-UD ☐ | RH2V2-UD ☐ | DC6V, **DC12V**, **DC24V**, DC48V, DC100-110V |
| | With Indicator and Diode (DC coil only) | RH2B-ULD ☐ | RH2V2-ULD ☐ | |
| 3PDT  | Standard | RH3B-U ☐ | RH3V2-U ☐ | AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V |
| | With Indicator | RH3B-UL ☐ | RH3V2-UL ☐ | |
| | With Check Button | RH3B-UC ☐ | — | |
| | With Indicator and Check Button | RH3B-ULC ☐ | — | |
| | Top Bracket Mounting | RH3B-UT ☐ | — | |
| | With Diode (DC coil only) | RH3B-UD ☐ | — | DC6V, DC12V, DC24V, DC48V, DC110V |
| | With Indicator and Diode (DC coil only) | RH3B-ULD ☐ | — | |
| 4PDT  | Standard | RH4B-U ☐ | RH4V2-U ☐ | AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V |
| | With Indicator | RH4B-UL ☐ | RH4V2-UL ☐ | |
| | With Check Button | RH4B-UC ☐ | — | |
| | With Indicator and Check Button | RH4B-ULC ☐ | — | |
| | Top Bracket Mounting | RH4B-UT ☐ | — | |
| | With Diode (DC coil only) | RH4B-UD ☐ | RH4V2-UD ☐ | DC6V, DC12V, DC24V, DC48V, DC110V |
| | With Indicator and Diode (DC coil only) | RH4B-ULD ☐ | — | |

PCB terminal relays are designed to mount directly to a circuit board without any socket.

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

(example) **RH3B-U** **AC120V**
Part No. — Coil Voltage Code

## Sockets (for Blade Terminal Models)

| Relays | Standard DIN Rail Mount [1] | Finger-safe DIN Rail Mount [1] | Through Panel Mount | PCB Mount |
|---|---|---|---|---|
| RH1B | SH1B-05 | SH1B-05C | SH1B-51 | SH1B-62 |
| RH2B | SH2B-05 | SH2B-05C | SH2B-51 | SH2B-62 |
| RH3B | SH3B-05 | SH3B-05C | SH3B-51 | SH3B-62 |
| RH4B | SH4B-05 | SH4B-05C | SH4B-51 | SH4B-62 |
| |  |  |  |  |

1. DIN Rail mount socket comes with two horseshoe clips. Do not use unless you plan to insert pullover wire spring. Replacement horseshoe clip part number is Y778-011.

## Hold Down Springs & Clips

| Appearance | Item | Relay | For DIN Mount Socket | For Through Panel & PCB Mount Socket |
|---|---|---|---|---|
|  | Pullover Wire Spring | RH1B | SY2S-02F1 [2] | SY4S-51F1 |
| | | RH2B | SY4S-02F1 [2] | |
| | | RH3B | SH3B-05F1 [2] | |
| | | RH4B | SH4B-02F1 [2] | |
|  | Leaf Spring (side latch) | RH1B, RH2B, RH3B, RH4B | SFA-202 [3] | SFA-302 [3] |
|  | Leaf Spring (top latch) | RH1B, RH2B, RH3B, RH4B | SFA-101 [3] | SFA-301 [3] |

2. Must use horseshoe clip when mounting in DIN mount socket. Replacement horseshoe clip part number is Y778-011.
3. Two required per relay.

## AC Coil Ratings

| Voltage (V) | Rated Current (mA) ±15% at 20°C | | | | | | | | Coil Resistance (Ω) ±10% at 20°C | | | | Operation Characteristics (against rated values at 20°C) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AC 50Hz | | | | AC 60Hz | | | | | | | | | | |
| | SPDT | DPDT | 3PDT | 4PDT | SPDT | DPDT | 3PDT | 4PDT | SPDT | DPDT | 3PDT | 4PDT | Max. Continuous Applied Voltage | Pickup Voltage | Dropout Voltage |
| 6 | 170 | 240 | 330 | 387 | 150 | 200 | 280 | 330 | 18.8 | 9.4 | 6.4 | 5.4 | 110% | 80% maximum | 30% minimum |
| 12 | 86 | 121 | 165 | 196 | 75 | 100 | 140 | 165 | 76.8 | 39.3 | 25.3 | 21.2 | | | |
| **24** | 42 | 60.5 | 81 | 98 | 37 | 50 | 70 | 83 | 300 | 153 | 103 | 84.5 | | | |
| 110 | 9.6 | — | 18.1 | 21.6 | 8.4 | — | 15.5 | 18.2 | 6,950 | — | 2,200 | 1,800 | | | |
| **110-120** | — | 9.4-10.8 | — | — | — | 8.0-9.2 | — | — | — | — | — | — | | | |
| **120** | 8.6 | — | 16.4 | 19.5 | 7.5 | — | 14.2 | 16.5 | 8,100 | — | 10,800 | 7,360 | | | |
| 220 | 4.7 | — | 8.8 | 10.7 | 4.1 | — | 7.7 | 9.1 | 25,892 | — | 10,800 | 7,360 | | | |
| **220-240** | — | 4.7-5.4 | — | — | — | 4.0-4.6 | — | | — | 18,820 | — | — | | | |
| **240** | 4.9 | — | 8.2 | 9.8 | 4.3 | — | 7.1 | 8.3 | 26,710 | — | 12,100 | 9,120 | | | |

## DC Coil Ratings

| Voltage (V) | Rated Current (mA) ±15% at 20°C | | | | Coil Resistance (Ω) ±10% at 20°C | | | | Operation Characteristics (against rated values at 20°C) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SPDT | DPDT | 3PDT | 4PDT | SPDT | DPDT | 3PDT | 4PDT | Max. Continuous Applied Voltage | Pickup Voltage | Dropout Voltage |
| 6 | 128 | 150 | 240 | 250 | 47 | 40 | 25 | 24 | 110% | 80% maximum | 10% minimum |
| 12 | 64 | 75 | 120 | 125 | 188 | 160 | 100 | 96 | | | |
| **24** | 32 | 36.9 | 60 | 62 | 750 | 650 | 400 | 388 | | | |
| 48 | 18 | 18.5 | 30 | 31 | 2,660 | 2,600 | 1,600 | 1,550 | | | |
| 100-110 | — | 8.2-9.0 | — | — | — | 12,250 | — | — | | | |
| 110 | 8 | — | 12.8 | 15 | 13,800 | — | 8,600 | 7,340 | | | |

Standard coil voltages are in **BOLD**.

## Contact Ratings

| Model | Continuous Current | Maximum Contact Capacity: Allowable Contact Power: Resistive Load | Allowable Contact Power: Inductive Load | Rated Load: Voltage (V) | Rated Load: Res. Load | Rated Load: Ind. Load |
|---|---|---|---|---|---|---|
| SPDT | 10A | 1540VA 300W | 990VA 210W | 110 AC | 10A | 7A |
| | | | | 220 AC | 7A | 4.5A |
| | | | | 30 DC | 10A | 7A |
| DPDT 3PDT 4PDT | 10A | 1650VA 300W | 1100VA 225W | 110 AC | 10A | 7.5A |
| | | | | 220 AC | 7.5A | 5A |
| | | | | 30 DC | 10A | 7.5A |

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

## TÜV Ratings

| Voltage | RH1 | RH2 | RH3 | RH4 |
|---|---|---|---|---|
| 240V AC | 10A | 10A | 7.5A | 7.5A |
| 30V DC | 10A | 10A | 10A | 10A |

AC: cos ø = 1.0, DC: L/R = 0 ms

## UL Ratings

| Voltage | Resistive | | | General Use | | | Horsepower Rating | | |
|---|---|---|---|---|---|---|---|---|---|
| | RH1 RH2 | RH3 | RH4 | RH1 RH2 | RH3 | RH4 | RH1 RH2 | RH3 | RH4 |
| 240V AC | 10A | 7.5A | 7.5A | 7A | 6.5A | 5A | 1/3 HP | 1/3 HP | — |
| 120V AC | — | 10A | 10A | — | 7.5A | 7.5A | 1/6 HP | 1/6 HP | — |
| 30V DC | 10A | 10A | — | 7A | — | — | — | — | — |
| 28V DC | — | — | 10A | — | — | — | — | — | — |

## CSA Ratings

| Voltage | Resistive | | | | General Use | | | | Horse-power Rating |
|---|---|---|---|---|---|---|---|---|---|
| | RH1 | RH2 | RH3 | RH4 | RH1 | RH2 | RH3 | RH4 | RH1, 2, 3 |
| 240V AC | 10A | 10A | — | 7.5A | 7A | 7A | 7A | 5A | 1/3 HP |
| 120V AC | 10A | 10A | 10A | 10A | 7.5A | 7.5A | — | 7.5A | 1/6 HP |
| 30V DC | 10A | 10A | 10A | 10A | 7A | 7.5A | — | — | — |

## Socket Specifications

| | Sockets | Terminal | Electrical Rating | Wire Size | Torque |
|---|---|---|---|---|---|
| DIN Rail Mount Sockets | SH1B-05 | (Coil) M3 screws (contact) M3.5 screws with captive wire clamp | 250V, 10A | Maximum up to 2–#12AWG | 5.5 - 9 in•lbs 9 - 11.5 in•lbs |
| | SH2B-05 SH3B-05 SH4B-05 | M3.5 screws with captive wire clamp | 300V, 10A | Maximum up to 2–#12AWG | 9 - 11.5 in•lbs |
| Finger-safe DIN Rail Mount | SH1B-05C | (coil) M3 screws (contact) M3.5 screws with captive wire clamp, fingersafe | 250V, 10A | Maximum up to 2–#12AWG | 5.5 - 9 in•lbs 9 - 11.5 in•lbs |
| | SH2B-05C SH3B-05C SH4B-05C | M3.5 screws with captive wire clamp, fingersafe | 300V, 10A | Maximum up to 2–#12AWG | 9 - 11.5 in•lbs |
| Through Panel Mount Socket | SH1B-51 SH2B-51 SH3B-51 SH4B-51 | Solder | 300V, 10A | — | — |
| PCB Mount Socket | SH1B-62 | PCB mount | 250V, 10A | — | — |
| | SH2B-62 SH3B-62 SH4B-62 | PCB mount | 300V, 10A | — | — |

## Accessories

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

## Specifications

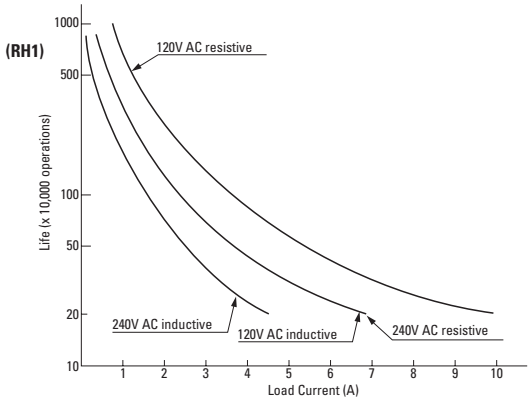
| | | | |
|---|---|---|---|
| Contact Material | | Silver cadmium oxide | |
| Contact Resistance [1] | | 50mΩ maximum | |
| Minimum Applicable Load | | 24V DC, 30 mA; 5V DC, 100 mA (reference value) | |
| Operating Time [2] | SPDT<br>DPDT | 20ms maximum | |
| | 3PDT<br>4PDT | 25ms maximum | |
| Release Time [2] | SPDT<br>DPDT | 20ms maximum | |
| | 3PDT<br>4PDT | 25ms maximum | |
| Power Consumption (approx.) | SPDT | AC: 1.1VA (50Hz), 1VA (60Hz) | DC: 0.8W |
| | DPDT | AC: 1.4VA (50Hz), 1.2VA (60Hz) | DC: 0.9W |
| | 3PDT | AC: 2VA (50Hz), 1.7VA (60Hz) | DC: 1.5W |
| | 4PDT | AC: 2.5VA (50Hz), 2VA (60Hz) | DC: 1.5W |
| Insulation Resistance | | 100MΩ minimum (500V DC megger) | |
| Dielectric Strength [3] | SPDT | Between live and dead parts:<br>Between contact and coil:<br>Between contacts of the same pole: | 2,000V AC, 1 minute<br>2,000V AC, 1 minute<br>1,000V AC, 1 minute |
| | DPDT<br>3PDT<br>4PDT | Between live and dead parts:<br>Between contact and coil:<br>Between contacts of different poles:<br>Between contacts of the same pole: | 2,000V AC, 1 minute<br>2,000V AC, 1 minute<br>2,000V AC, 1 minute<br>1,000V AC, 1 minute |
| Operating Frequency | | Electrical:<br>Mechanical: | 1,800 operations/hour maximum<br>18,000 operations/hour maximum |
| Vibration Resistance | | Damage limits:<br>Operating extremes: | 10 to 55Hz, amplitude 0.5 mm<br>10 to 55Hz, amplitude 0.5 mm |
| Shock Resistance | | Damage limits:<br>Operating extremes: | 1,000m/s$^2$ (100G)<br>200m/s$^2$ (20G - SPDT, DPDT)<br>100m/s$^2$ (10G - 3PDT, 4PDT) |
| Mechanical Life | | 50,000,000 operations minimum | |
| Electrical Life | DPDT | 500,000 operations minimum (120V AC, 10A) | |
| | SPDT<br>3PDT<br>4PDT | 200,000 operations minimum (120V AC, 10A) | |
| Operating Temperature [4] | SPDT<br>DPDT<br>3PDT<br>4PDT | –25 to +70°C (no freezing) | |
| Operating Humidity | | 45 to 85% RH (no condensation) | |
| Weight (approx.) | | SPDT: 24g, DPDT: 37g, 3PDT: 50g, 4PDT: 74g | |

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.

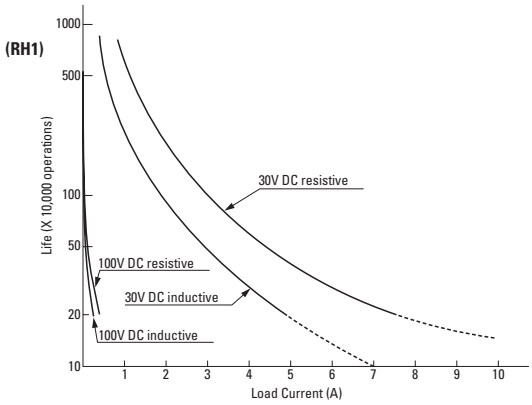
# Characteristics (Reference Data)

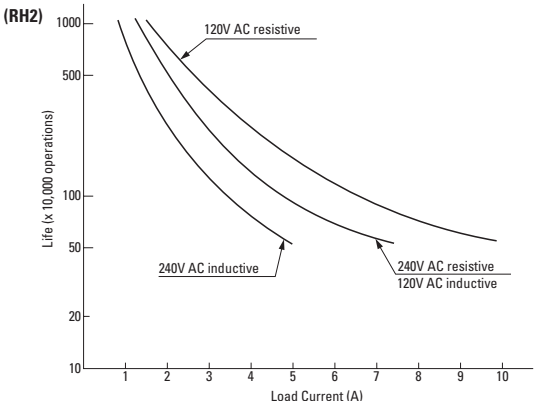
## Electrical Life Curves

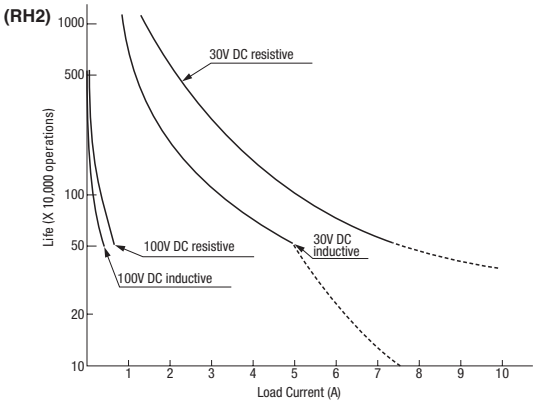
AC Load

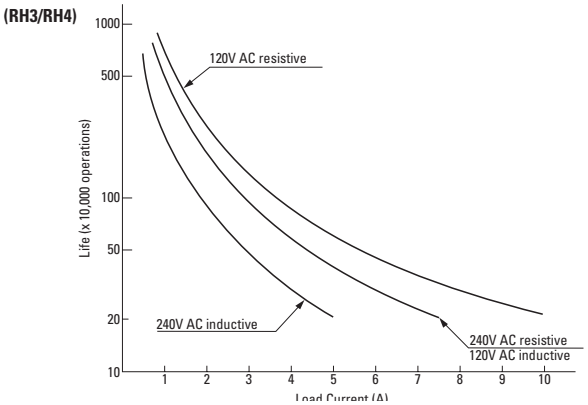


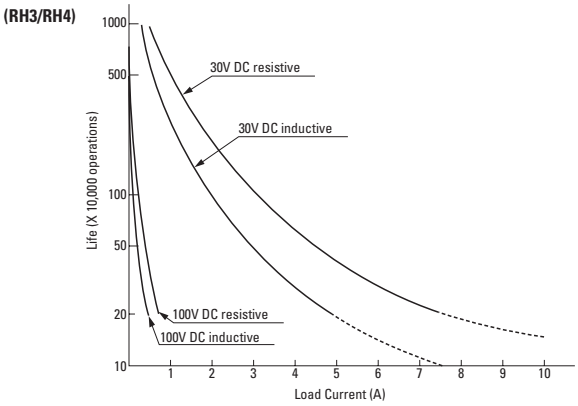

DC Load



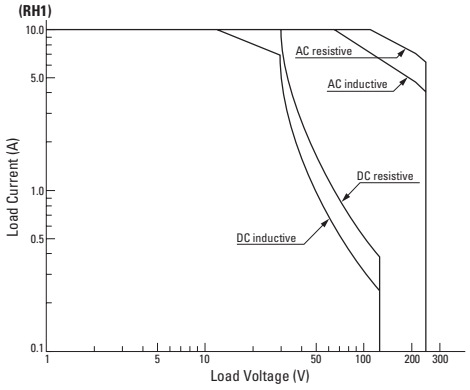



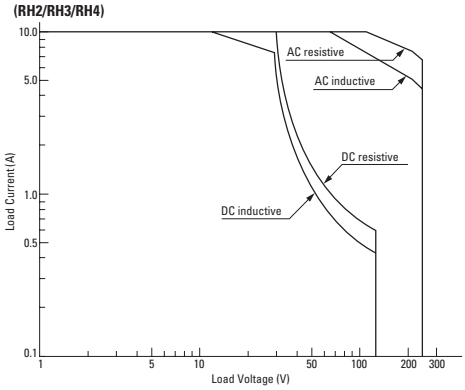



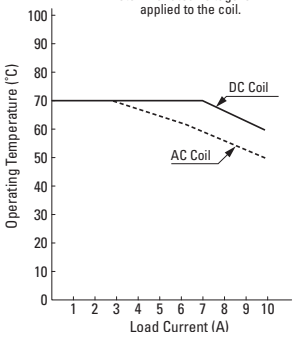

## Maximum Switching Capacity



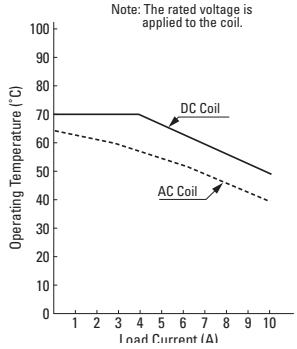



## Continuous Load Current vs. Operating Temperature Curve (Basic Type, With Check Button, and Top Bracket Mounting Type)

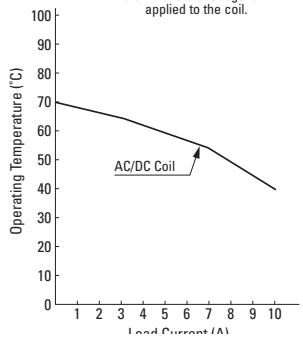
**(RH1)**




**(RH2)**



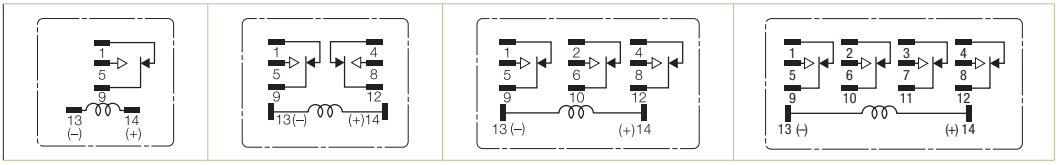

**(RH3/RH4)**



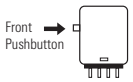

## Internal Connection (View from Bottom)

Basic Type

SPDT DPDT 3PDT 4PDT



With Check Button

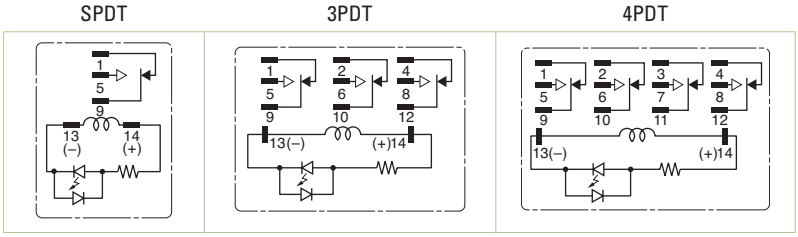



Contacts can be operated by pressing the check button.

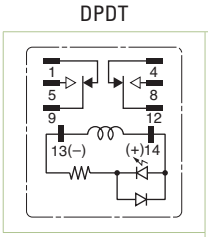
## With Indicator (-L type)

SPDT 3PDT 4PDT DPDT

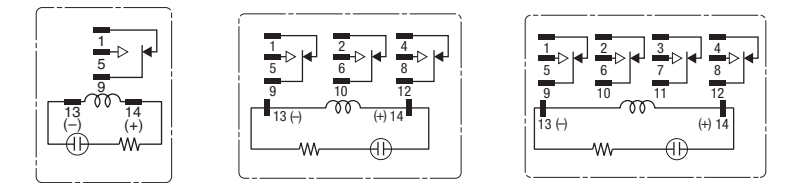
Below 100V AC/DC



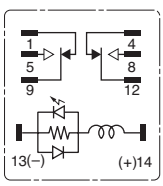
Below 24V AC/ DC



100V AC/DC and over



24V AC/ DC and over

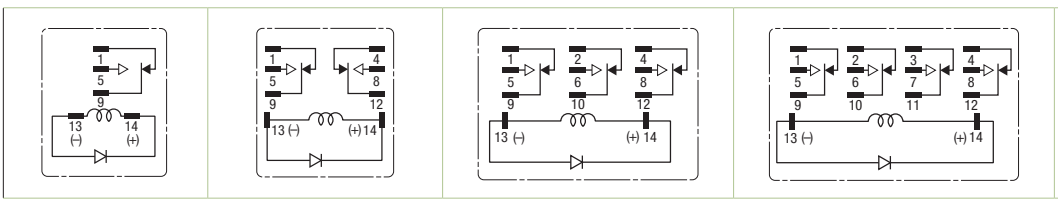


When the relay is energized, the indicator goes on.

- Relay coils less than 100V DC do not contain a protection diode (except DPDT).
- Relay coils below 100V use LED indicator, coils above 100V use neon lamp indicator.
- LED color of DPDT model is green

## With Diode (-D type)

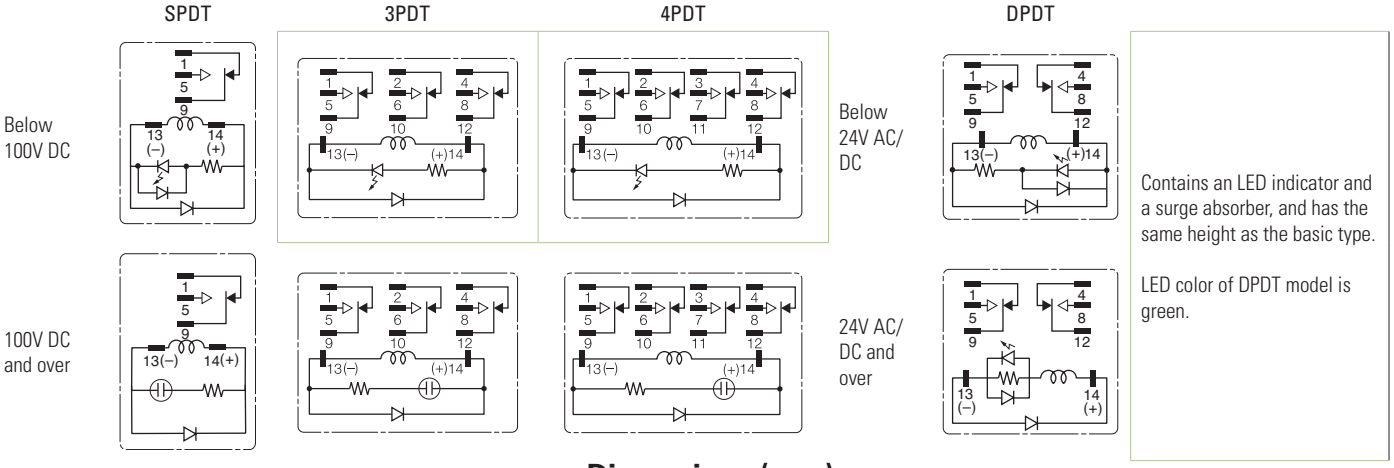
SPDT DPDT 3PDT 4PDT



Contains a diode to absorb the back emf generated when the coil is de-energized. The release time is slightly longer. Available for DC coil only.

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

## With Indicator LED & Diode (-LD type)

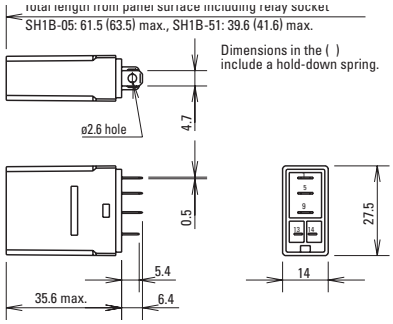



Contains an LED indicator and a surge absorber, and has the same height as the basic type.

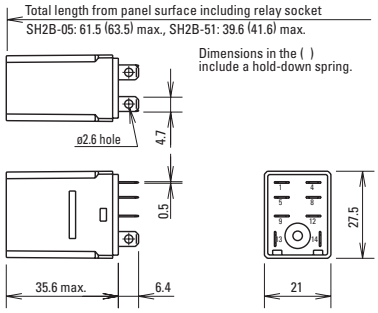
LED color of DPDT model is green.

## Dimensions (mm)

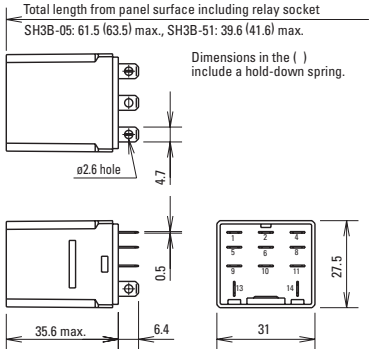
### RH1B-U/RH1B-UL/RH1B-UD/RH1B-ULD



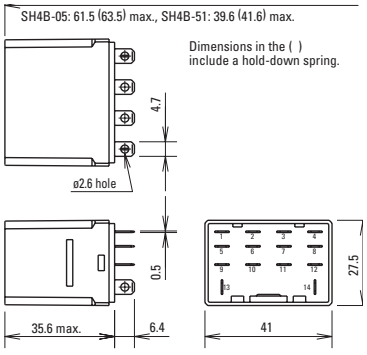

### RH2B-U/RH2B-UL/RH2B-UD/RH2B-ULD



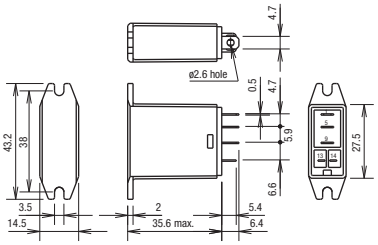

### RH3B-U/RH3B-UL/RH3B-UD/RH3B-ULD



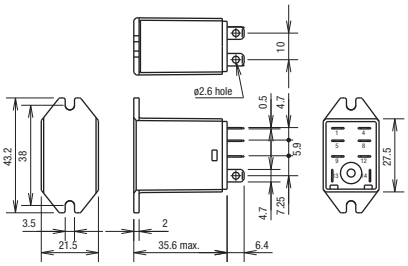

### RH4B-U/RH4B-UL/RH4B-UD/RH4B-ULD



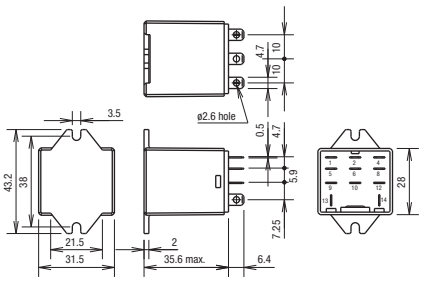

### RH1B-UT



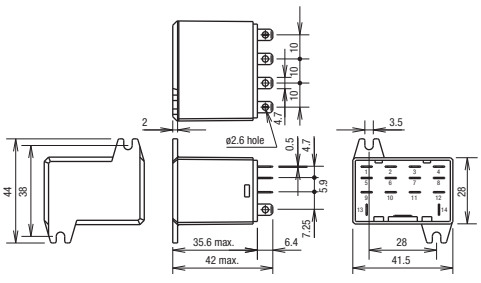

### RH2B-UT




### RH3B-UT

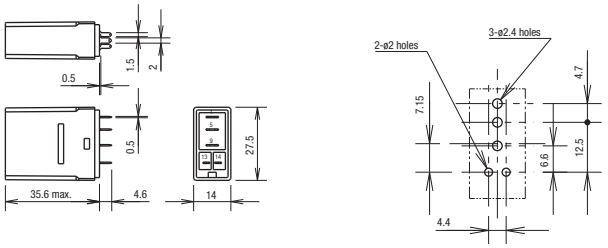



### RH4B-UT

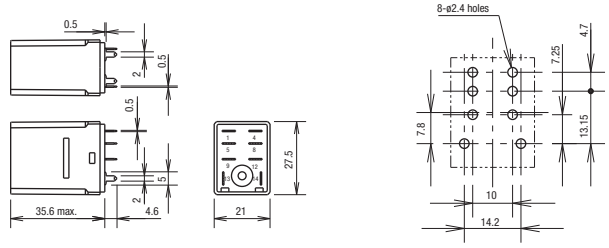


## Dimensions con't (mm)

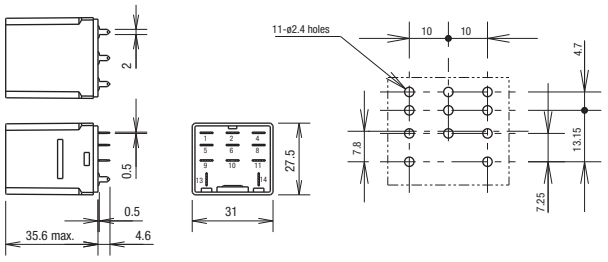
### RH1V2-U/RH1V2-UD



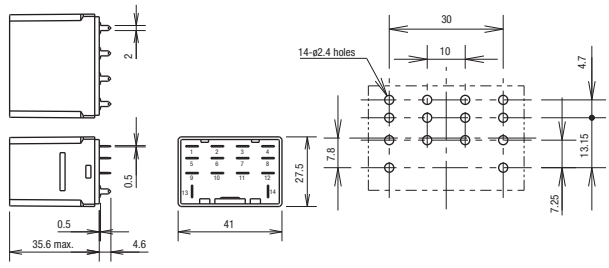

### RH2V2-U/RH2V2-UL/RH2V2-UD




### RH3V2-U/RH3V2-UL/RH3V2-D

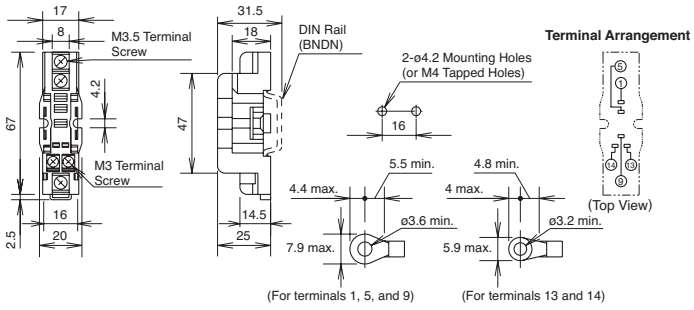



### RH4V2-U/RH4V2-UL/RH4V2-UD

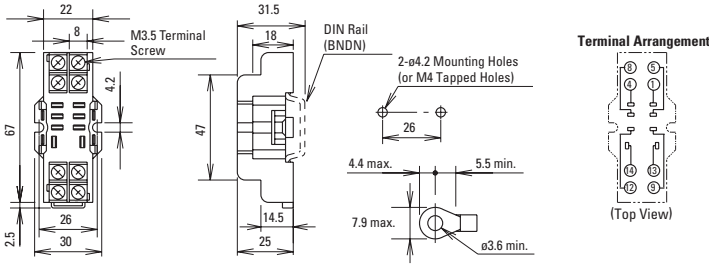



## Standard DIN Rail Mount Sockets

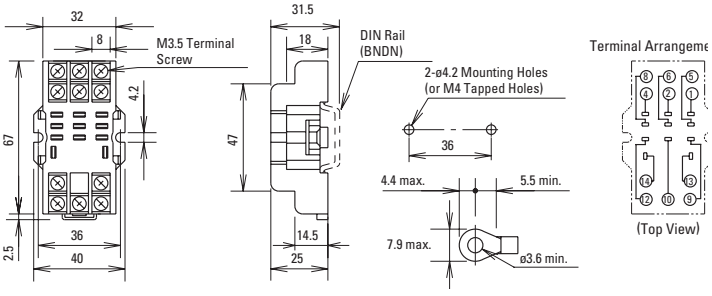
### SH1B-05



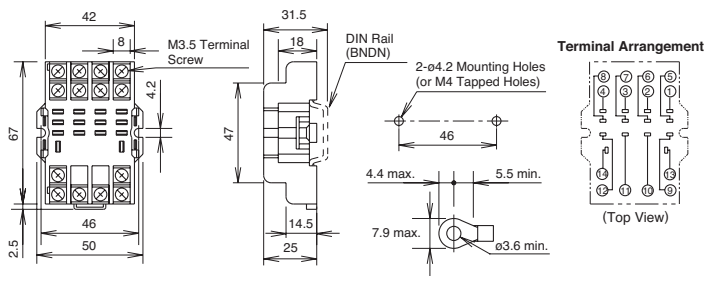

### SH2B-05




### SH3B-05



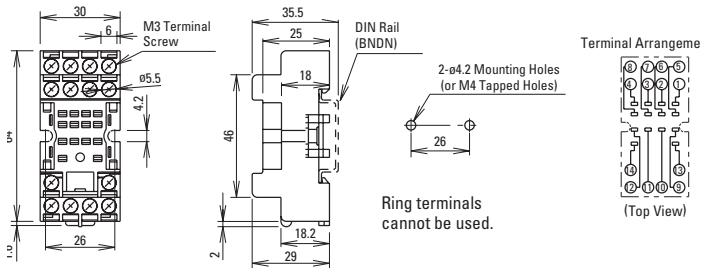

### SH4B-05



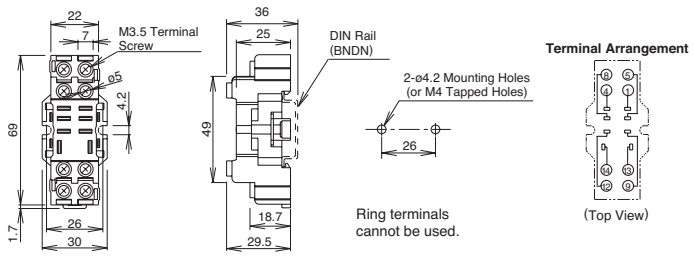
# Dimensions con't (mm)

## Finger-safe DIN Rail Mount Sockets

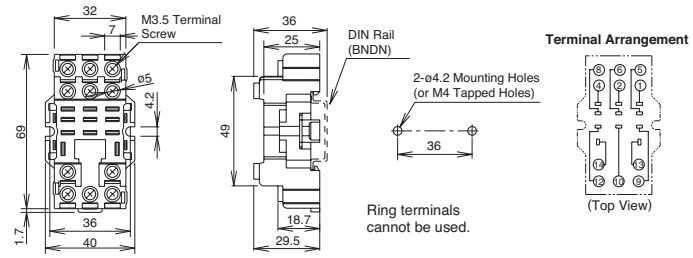
### SH1B-05C



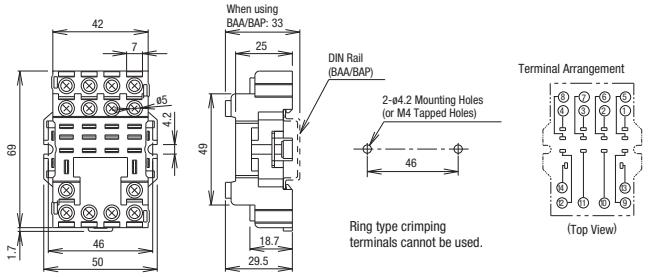

### SH2B-05C




### SH3B-05C

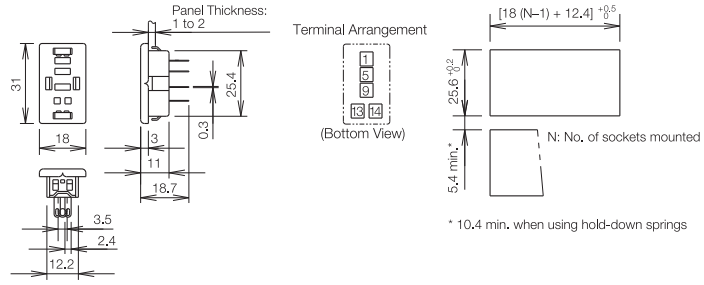



### SH4B-05C

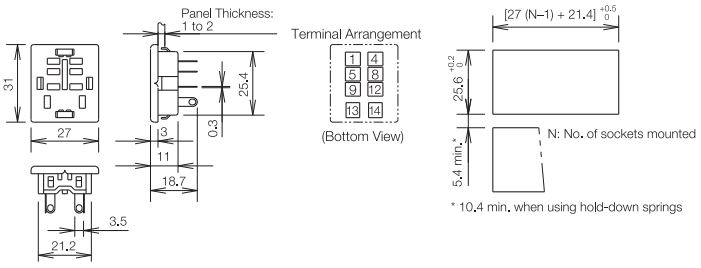



## Through Panel Mount Socket

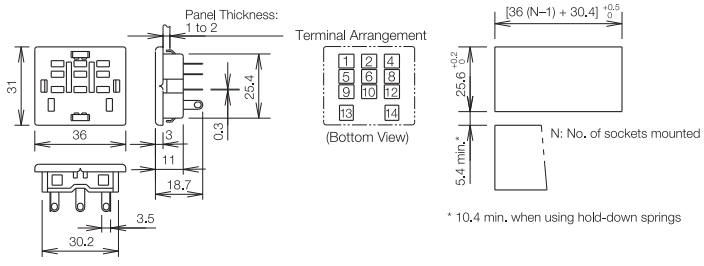
### SH1B-51



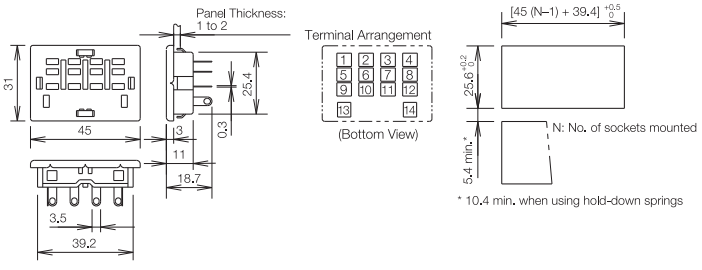

### SH2B-51




### SH3B-51



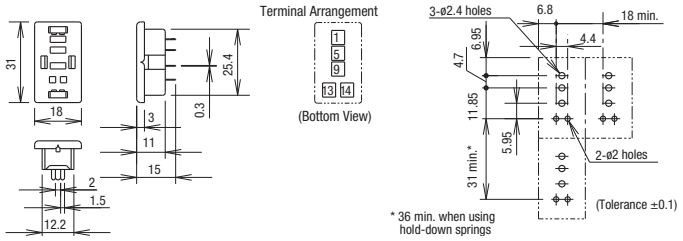

### SH4B-51



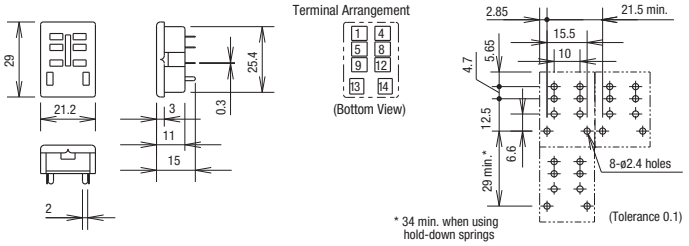
## Dimensions con't (mm)

### PCB Mount Sockets

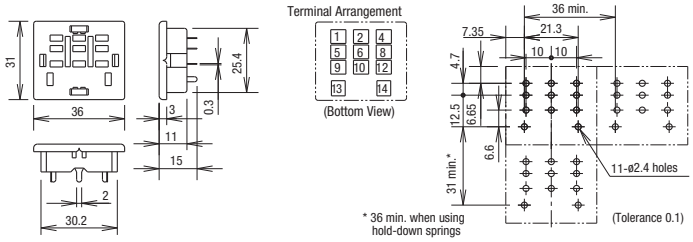
#### SH1B-62




#### SH2B-62




#### SH3B-62




#### SH4B-62

