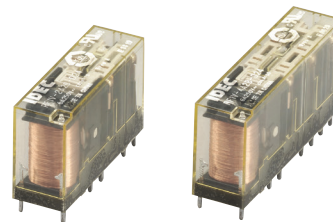





## RF1V Force Guided Relays/SF1V Relay Sockets

## Key features:

- Compact and EN compliant RF1V force guided relays
- Force guided contact mechanism (EN50205 Type A TÜV approved)
- Contact configuration  
4-pole (2NO-2NC, 3NO-1NC)  
6-pole (4NO-2NC, 5NO-1NC, 3NO-3NC)
- Built-in LED indicator model and Counter Electromotive force diode models
- Fast response time (8 ms maximum).
- High shock resistance (200 m/s<sup>2</sup> minimum)
- Finger-safe DIN rail mount socket and PC board mount soc





| Applicable Standard  | Marking   | Certification Organization/ File Number |
|----------------------|---|---|
| UL508                |  | UL recognized<br>File No. E55996        |
| CSA C22.2 No.14      |  | CSA File No. 253350                     |
| EN50205<br>EN61810-1 |  | TÜV SÜD                                 |





## Part Number Selection

|         |                    | Part Number           |                    |                             |                  |
|---------|--------------------|-----------------------|--------------------|-----------------------------|------------------|
| Contact | Rated Coil Voltage | Without LED Indicator | With LED Indicator | Counter-Electromotive Force |                  |
| 4-pole  | 2NO-2NC            | 12V DC                | RF1V-2A2B-D12      | RF1V-2A2BL-D12              | RF1V-2A2BLD1-D12 |
|         |                    | 24V DC                | RF1V-2A2B-D24      | RF1V-2A2BL-D24              | RF1V-2A2BLD1-D24 |
|         |                    | 48V DC                | RF1V-2A2B-D48      | RF1V-2A2BL-D48              | RF1V-2A2BLD1-D48 |
|         | 3NO-1NC            | 12V DC                | RF1V-3A1B-D12      | RF1V-3A1BL-D12              | RF1V-3A1BLD1-D12 |
|         |                    | 24V DC                | RF1V-3A1B-D24      | RF1V-3A1BL-D24              | RF1V-3A1BLD1-D24 |
|         |                    | 48V DC                | RF1V-3A1B-D48      | RF1V-3A1BL-D48              | RF1V-3A1BLD1-D48 |
| 6-pole  | 4NO-2NC            | 12V DC                | RF1V-4A2B-D12      | RF1V-4A2BL-D12              | RF1V-4A2BLD1-D12 |
|         |                    | 24V DC                | RF1V-4A2B-D24      | RF1V-4A2BL-D24              | RF1V-4A2BLD1-D24 |
|         |                    | 48V DC                | RF1V-4A2B-D48      | RF1V-4A2BL-D48              | RF1V-4A2BLD1-D48 |
|         | 5NO-1NC            | 12V DC                | RF1V-5A1B-D12      | RF1V-5A1BL-D12              | RF1V-5A1BLD1-D12 |
|         |                    | 24V DC                | RF1V-5A1B-D24      | RF1V-5A1BL-D24              | RF1V-5A1BLD1-D24 |
|         |                    | 48V DC                | RF1V-5A1B-D48      | RF1V-5A1BL-D48              | RF1V-5A1BLD1-D48 |
|         | 3NO-3NC            | 12V DC                | RF1V-3A3B-D12      | RF1V-3A3BL-D12              | RF1V-3A3BLD1-D12 |
|         |                    | 24V DC                | RF1V-3A3B-D24      | RF1V-3A3BL-D24              | RF1V-3A3BLD1-D24 |
|         |                    | 48V DC                | RF1V-3A3B-D48      | RF1V-3A3BL-D48              | RF1V-3A3BLD1-D48 |

## Sockets

| Style  | No. of Poles | Ordering Type No. |
|--|--------------|-------------------|
|  DIN Rail Mount Sockets | 4            | SF1V-4-07L        |
|  | 6            | SF1V-6-07L        |
|  PC Board Mount Sockets | 4            | SF1V-4-61         |
|  | 6            | SF1V-6-61         |

## Certification for Sockets

| Applicable Standard  | Marking   | Certification Organization/ File Number                   |
|----------------------|---|---|
| UL508                |  | UL recognized<br>File No. E62437                          |
| CSA C22.2 No.14      |  | CSA File No. 253350                                       |
| EN147000<br>EN147100 |  | TÜV SÜD   |
|                      |  | EC Low Voltage Directive<br>(DIN rail mount sockets only) |




## Coil Ratings

| Contact | Rated Coil Voltage (V) | Rated Current (mA) ±10% (at 20°C) <sup>1</sup> | Coil Resistance (Ω) ±10% (at 20°C) | Operating Characteristics (at 20°C) |                 |   | Power Consumption |             |      |              |
|---------|------------------------|--|------------------------------------|-------------------------------------|-----------------|---|-------------------|-------------|------|--------------|
|         |                        |  |                                    | Pickup Voltage                      | Dropout Voltage | Maximum Continuous Applied Voltage <sup>2</sup> |                   |             |      |              |
| 4-pole  | 2NO-2NC                | 12V DC   | 30                                 | 75% maximum                         | 10% minimum     | 110%  | Approx. 0.36W     |             |      |              |
|         |                        | 24V DC   | 15                                 |                                     |                 |   |                   |             |      |              |
|         |                        | 48V DC   | 7.5                                |                                     |                 |   |                   |             |      |              |
|         | 3NO-1NC                | 12V DC   | 30                                 |                                     |                 |   |                   |             |      |              |
|         |                        | 24V DC   | 15                                 |                                     |                 |   |                   |             |      |              |
|         |                        | 48V DC   | 7.5                                |                                     |                 |   |                   |             |      |              |
| 6-pole  | 4NO-2NC                | 12V DC   | 41.7                               |                                     |                 |   | 75% maximum       | 10% minimum | 110% | Approx. 0.5W |
|         |                        | 24V DC   | 20.8                               |                                     |                 |   |                   |             |      |              |
|         |                        | 48V DC   | 10.4                               |                                     |                 |   |                   |             |      |              |
|         | 5NO-1NC                | 12V DC   | 41.7                               |                                     |                 |   |                   |             |      |              |
|         |                        | 24V DC   | 20.8                               |                                     |                 |   |                   |             |      |              |
|         |                        | 48V DC   | 10.4                               |                                     |                 |   |                   |             |      |              |
|         | 3NO-3NC                | 12V DC   | 41.7                               |                                     |                 |   |                   |             |      |              |
|         |                        | 24V DC   | 20.8                               |                                     |                 |   |                   |             |      |              |
|         |                        | 48V DC   | 10.4                               |                                     |                 |   |                   |             |      |              |



- For relays with LED indicator, the rated current increases by approx. 2 mA.
- Maximum continuous applied voltage is the maximum voltage that can be applied to relay coils.

## Accessories

| Item     | Appearance  | Specifications                                   | Type No. | Remarks                    |
|----------|---|--|----------|----------------------------|
| DIN Rail |  | Aluminum<br>Weight: Approx. 250g                 | BNDN1000 | Length: 1m<br>Width: 35 mm |
| End Clip |  | Metal (zinc plated steel)<br>Weight: Approx. 15g | BNL5     | —                          |
|          |  |  | BNL6     |                            |

## Specifications

|   |   |   |  |         |         |
|---|---|---|--|---------|---------|
| Number of Poles                                 | 4-pole  |   | 6-pole   |         |         |
| Contact Configuration                           | 2NO-2NC   | 3NO-1NC   | 4NO-2NC  | 5NO-1NC | 3NO-3NC |
| Contact Resistance (initial value) <sup>1</sup> | 100 mΩ maximum  |   |  |         |         |
| Contact Material                                | AgSnO <sub>2</sub> (Au flashed)   |   |  |         |         |
| Rated Load (resistive load)                     | 6A 250V AC, 6A 30V DC   |   |  |         |         |
| Allowable Switching Power (resistive load)      | 1500 VA, 180W   |   |  |         |         |
| Allowable Switching Voltage                     | 250V AC, 30V DC   |   |  |         |         |
| Allowable Switching Current                     | 6A  |   |  |         |         |
| Minimum Applicable Load <sup>2</sup>            | 5V DC, 1 mA (reference value)   |   |  |         |         |
| Power Consumption (approx.)                     | 0.36W   |   | 0.5W   |         |         |
| Insulation Resistance                           | 1000 MΩ minimum (500V DC megger, same measurement positions as the dielectric strength)   |   |  |         |         |
| Dielectric Strength                             | Between contact and coil  | 4000V AC, 1 minute  |  |         |         |
|   | Between contacts of different poles   | 2500V AC, 1 minute<br>Between contacts 7-8 and 9-10   | 2500V AC, 1 minute<br>Between contacts 7-8 and 11-12<br>Between contacts 9-10 and 13-14<br>Between contacts 11-12 and 13-14                        |         |         |
|   |   | 4000V AC, 1 min.<br>Between contacts 3-4 and 5-6<br>Between contacts 3-4 and 7-8<br>Between contacts 5-6 and 9-10 | 4000V AC, 1 min.<br>Between contacts 3-4 and 5-6<br>Between contacts 3-4 and 7-8<br>Between contacts 5-6 and 9-10<br>Between contacts 7-8 and 9-10 |         |         |
|   | Between contacts of the same pole   | 1500V AC, 1 minute  |  |         |         |
| Operating Time (at 20°C)                        | 20 ms maximum (at the rated coil voltage, excluding contact bounce time)  |   |  |         |         |
| Response Time (at 20°C) <sup>3</sup>            | 8 ms maximum (at the rated coil voltage, excluding contact bounce time)   |   |  |         |         |
| Release Time (at 20°C)                          | 20 ms maximum (at the rated coil voltage, excluding contact bounce time)  |   |  |         |         |
| Vibration Resistance                            | Operating Extremes  | 10 to 55 Hz, amplitude 0.75 mm  |  |         |         |
|   | Damage Limits   | 10 to 55 Hz, amplitude 0.75 mm  |  |         |         |
| Shock Resistance                                | Operating Extremes (half sine-wave pulse: 11 ms)  | 200 m/s <sup>2</sup> , when mounted on DIN rail mount socket: 150 m/s <sup>2</sup>                                |  |         |         |
|   | Damage Limits (half sine-wave pulse: 6 ms)  | 1000 m/s <sup>2</sup>   |  |         |         |
| Electrical Life                                 | 250V AC 6A resistive load: 100,000 operations minimum (operating frequency 1200 per hour)<br>30V DC 6A resistive load: 100,000 operations minimum (operating frequency 1200 per hour)<br>250V AC 1A resistive load: 500,000 operations minimum (operating frequency 1800 per hour)<br>30V DC 1A resistive load: 500,000 operations minimum (operating frequency 1800 per hour)<br>[AC 15] 240V AC 2A inductive load: 100,000 operations minimum (operating frequency 1200 per hour, cos φ = 0.3)<br>[DC 13] 24V DC 1A inductive load: 100,000 operations minimum (operating frequency 1200 per hour, L/R = 48 ms) |   |  |         |         |
| Mechanical Life                                 | 10 million operations minimum (operating frequency 10,800 operations per hour)  |   |  |         |         |
| Operating Temperature <sup>4</sup>              | -40 to +85°C (no freezing)  |   |  |         |         |
| Operating Humidity                              | 5 to 85%RH (no condensation)  |   |  |         |         |
| Storage Temperature                             | -40 to +85°C  |   |  |         |         |
| Operating Frequency (rated load)                | 1200 operations per hour  |   |  |         |         |
| Weight (approx.)                                | 20g   |   | 23g  |         |         |




1. Measured using 6V DC, 1A voltage drop method.
2. Failure rate level P (reference value)

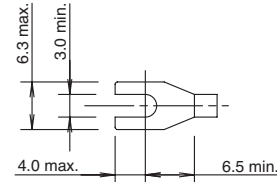
3. Response time is the time until NO contact opens, after the coil voltage is turned off.
4. When using at 70 to 85°C, reduce the switching current by 0.1A/°C.


## Socket Specifications

| Part Number                         | SF1V-4-07L   | SF1V-6-07L | SF1V-4-61 | SF1V-6-61 |
|-------------------------------------|--|------------|-----------|-----------|
| Rated Current                       | 6A   |            |           |           |
| Rated Voltage                       | 250V AC/DC   |            |           |           |
| Insulation Resistance               | 1000 MΩ minimum<br>(500V DC megger, between terminals)                                     |            |           |           |
| Dielectric Strength                 | 2500V AC, 1 minute (between terminals)   |            |           |           |
| Screw Terminal Style                | M3 slotted Phillips screw  |            | —         |           |
| Applicable Wire                     | 0.7 to 1.65 mm <sup>2</sup> (18 AWG to 14 AWG)   |            | —         |           |
| Recommended Screw Tightening Torque | 0.5 to 0.8 N·m   |            | —         |           |
| Terminal Strength                   | Wire tensile strength: 50N min.  |            | —         |           |
| Vibration Resistance                | Damage limits: 10 to 55 Hz, amplitude 0.75 mm<br>Resonance: 10 to 55 Hz, amplitude 0.75 mm |            |           |           |
| Shock Resistance                    | 1000 m/s <sup>2</sup>  |            |           |           |
| Operating Temperature <sup>1</sup>  | -40 to +85°C (no freezing)   |            |           |           |
| Operating Humidity                  | 5 to 85% RH (no condensation)  |            |           |           |
| Degree of Protection                | IP20 (finger-safe screw terminals)   |            | —         |           |
| Weight (approx.)                    | 40g  | 55g        | 9g        | 10g       |

 1. When using at 70 to 85°C, reduce the switching current by 0.1A/°C.

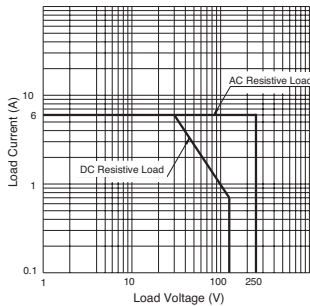
## Applicable Crimping Terminals Specifications



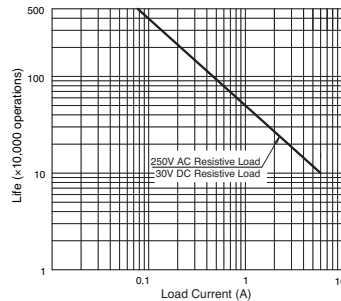
 Note: Ring tongue terminals cannot be used.

## Characteristics

### Maximum Switching Capacity

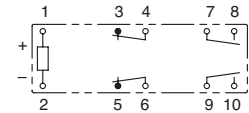


### Electrical Life Curve



## Notes on Contact Gaps except Welded Contacts

Example: RF1V-2A2B-D24



- If the NO contact (7-8 or 9-10) welds, the NC contact (3-4 or 5-6) remains open even when the relay coil is de-energized, maintaining a gap of 0.5 mm. The remaining unwelded NO contact (9-10 or 7-8) is either open or closed.
- If the NC contact (3-4 or 5-6) welds, the NO contact (7-8 or 9-10) remains open even when the relay coil is energized, maintaining a gap of 0.5 mm. The remaining unwelded NC contact (5-6 or 3-4) is either open or closed.

Switches & Pilot Lights

Signaling Lights

Relays & Sockets

Timers

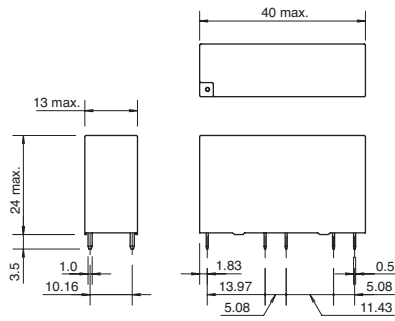
Contactors

Terminal Blocks

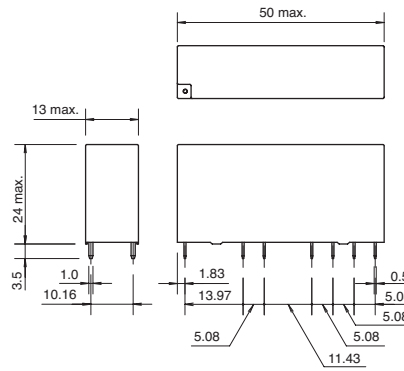
Circuit Breakers

RF1V Dimensions (mm)

RF1V (4-pole)

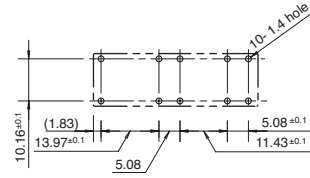


RF1V (6-pole)

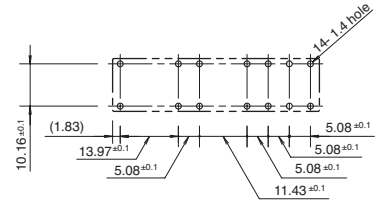


PC Board Terminal type Mounting Hole Layout (Bottom View)

RF1V (4-pole)



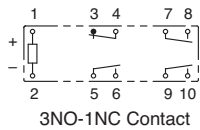
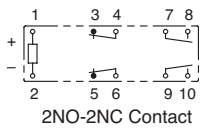
RF1V (6-pole)



Internal Connection (View from Bottom)  
With Indicator and Diode (-LD type)

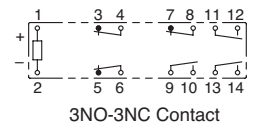
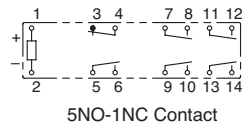
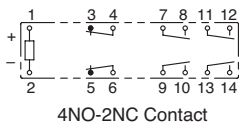
RF1V (4-pole)

Without LED Indicator

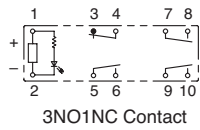
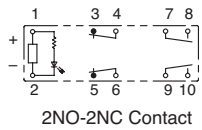


RF1V (6-pole)

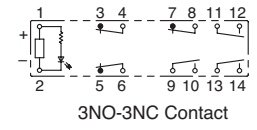
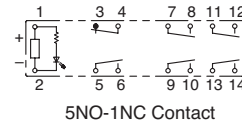
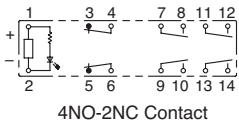
Without LED Indicator



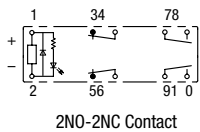
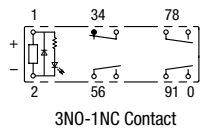
With LED Indicator



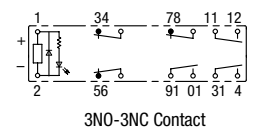
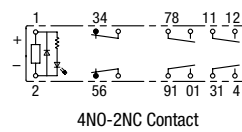
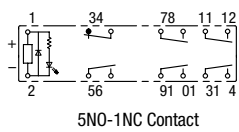
With LED Indicator



With Counter-electromotive Force Diode



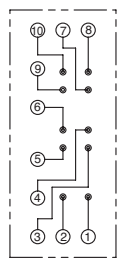
With Counter-electromotive Force Diode



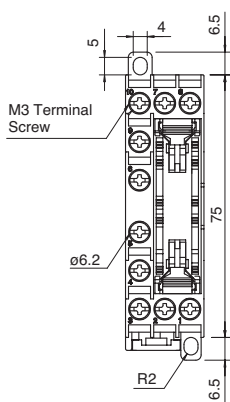
SF1V DIN Rail Mount Socket Dimensions (mm)

SF1V-4-07L (4-pole)

(Internal Connection)

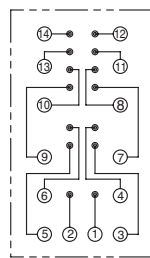


(Top View)

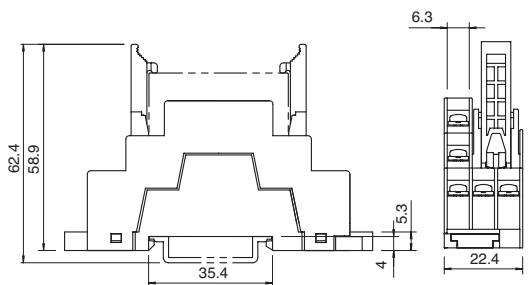
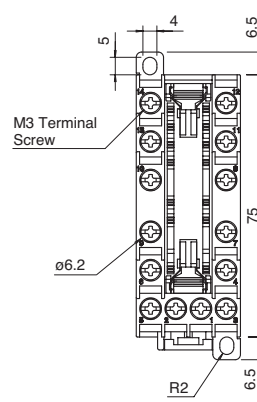


SF1V-6-07L (6-pole)

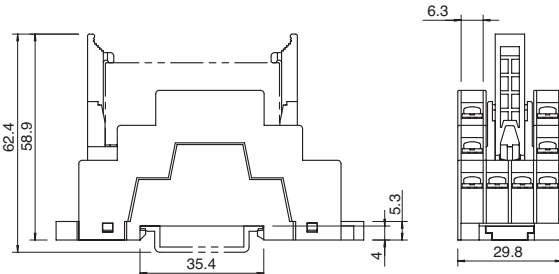
(Internal Connection)



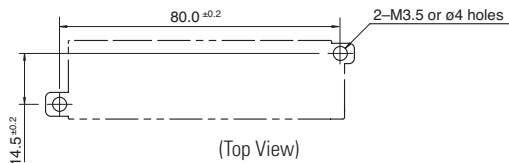
(Top View)



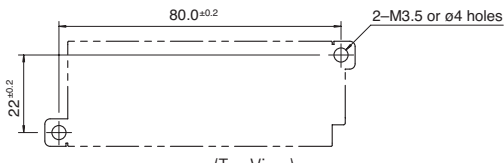
(Panel Mounting Hole Layout)



(Panel Mounting Hole Layout)



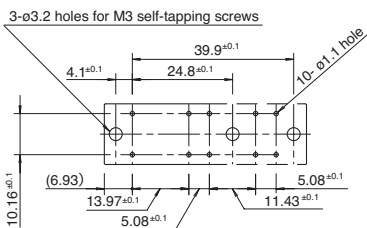
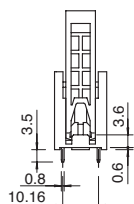
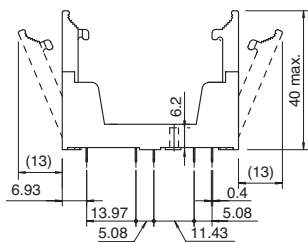
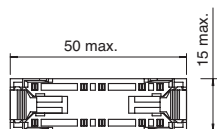
(Top View)



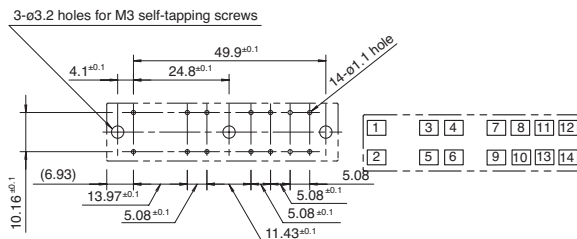
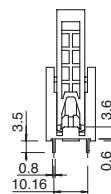
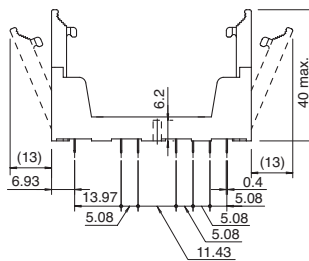
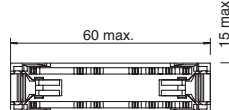
(Top View)

SF1V PC Board Mount Sockets

SF1V-4-07L (4-pole)



SF1V-6-07L (6-pole)



Switches & Pilot Lights

Signaling Lights

Relays & Sockets

Timers

Contactors

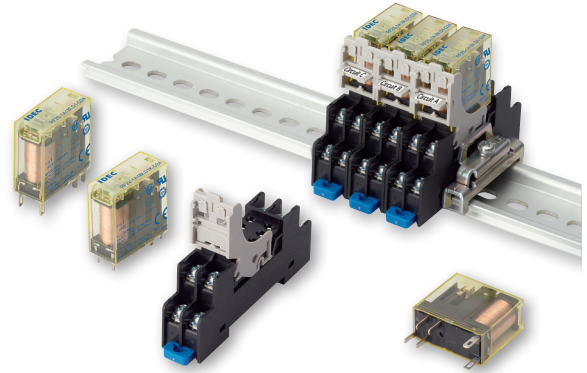
Terminal Blocks

Circuit Breakers

RF2V 2-Pole Force Guided Relays/SJ Series Relay Sockets

Key features:

- 2-pole force guided relay to reduce cost and installation space.
- Force guided contact mechanism (EN50205 Type A TÜV approved).
- Reinforced insulation between coil and contact and contacts of different poles.
- Mechanical indicator shows contact status.
- Two terminal styles - socket mounting and PC board mounting.
- RTIII degree of protection, LED, diode models available.
- Can be used with SJ series relay socket.
- Applicable Standards Mark Certification



| Applicable Standard  | Marking | Certification Organization/ File Number |
|----------------------|---------|---|
| UL60947-4-1a         |         | UL/Recognition File No. E55996          |
| CSA C22.2 No.14      |         | CSA File No. LR35144                    |
| EN50205<br>EN61810-1 |         | TÜV SÜD                                 |
|                      |         | EU Low Voltage Directive                |

Part Numbers

| Contact Configuration          | Terminal Style | LED Indicator | w/Diode | Degree of Protection (Note) |                | Rated Coil Voltage | Part No.          |                   |
|--------------------------------|----------------|---------------|---------|-----------------------------|----------------|--------------------|-------------------|-------------------|
|                                |                |               |         | Flux-tight (RTII)           | Sealed (RTIII) |                    |                   |                   |
| 2-pole<br>SPST-NO +<br>SPST-NC | Plug-in        | With          | √       | √                           |                | 12V DC             | RF2S-1A1BLD1-D12  |                   |
|                                |                | Without       | —       | √                           |                |                    | RF2S-1A1B-D24     |                   |
|                                |                | With          | √       | √                           |                | 24V DC             | RF2S-1A1BD1-D24   |                   |
|                                |                |               | √       |                             | √              |                    | RF2S-1A1BLD1K-D24 |                   |
|                                |                | Without       | —       | √                           |                |                    | RF2S-1A1B-D48     |                   |
|                                |                | With          | √       | √                           |                | 48V DC             | RF2S-1A1BLD1-D48  |                   |
|                                | √              |               |         | √                           |                | RF2S-1A1BLD1K-D48  |                   |                   |
|                                | PC Board       | Without       | —       | —                           | √              |                    | 12V DC            | RF2V-1A1B-D12     |
|                                |                |               | —       | —                           | √              |                    |                   | RF2V-1A1B-D24     |
|                                |                |               | —       | —                           |                | √                  |                   | RF2V-1A1BK-D24    |
|                                |                |               | √       | √                           |                | 24V DC             | RF2V-1A1BD1-D24   |                   |
|                                |                | With          | √       |                             | √              |                    |                   | RF2V-1A1BD1K-D24  |
|                                |                |               | √       |                             | √              |                    |                   | RF2V-1A1BLD1K-D24 |
|                                |                | Without       | —       | —                           | √              |                    | 48V DC            | RF2V-1A1B-D48     |
| Without                        |                | —             | —       | √                           |                | 24V DC             | RF2V-2C-D24       |                   |

Switches & Pilot Lights

Signalng Lights

Relays & Sockets

Timers

Contactors

Terminal Blocks

Circuit Breakers