

G5RL-U/-K

PCB Power Relay

16 A High Switching Current, General-purpose Latching Relay

- Creepage distance 8 mm between coil and contacts.
- 10 kV Impulse withstand voltage.
- Ambient Operating Temperature 85°C
- Suitable for TV-8 rating. (SPST-NO (1a))

RoHS Compliant



NEW

Model Number Legend

G5RL-□□□-□
1 2 3 4

1. Relay Function

U : Single-winding latching
K : Double-winding latching

3. Contact Form

None: SPDT (1c)
A : SPST-NO (1a)

2. Number of poles

1 : 1-Pole

4. Classification

E : High-capacity

Application Examples

- Housing equipments
- Building Automation
- UPS, FA equipment
- Electric power meter

G5RL-U/-K

Ordering Information

| Classification | Terminal Shape | Contact form | Enclosure rating | Single-winding latching | | Double-winding latching | | Minimum packing unit |
|----------------|----------------|--------------|------------------|-------------------------|-------------------------|-------------------------|---------------------------|----------------------|
| | | | | Model | Rated coil voltage | Model | Rated coil voltage | |
| High-capacity | PCB terminals | SPST-NO (1a) | Flux protection | G5RL-U1A-E | 3 VDC 5 VDC 6 VDC | G5RL-K1A-E | 5 VDC 12 VDC 24 VDC | 100 pcs/tray |
| | | SPDT (1c) | | G5RL-U1-E | 12 VDC 24 VDC | G5RL-K1-E | | |

Note. When ordering, add the rated coil voltage to the model number.

Example: G5RL-U1A-E 5 VDC

□□□□— Rated coil voltage

Ratings

Coil

Single-winding Latching Type

| Rated Voltage | Rated current (mA) | Coil resistance (Ω) | Must set voltage | Must reset voltage | Max voltage | Power consumption (W) |
|---------------|--------------------|---------------------|------------------|--------------------|-------------------|-----------------------|
| | | | | | | |
| 3 VDC | 200 | 15 | 70% max. | 70% max. | 130% (at 23°C) | Approx. 0.6 |
| 5 VDC | 120 | 41.7 | | | | |
| 6 VDC | 100 | 60 | | | | |
| 12 VDC | 50 | 240 | | | | |
| 24 VDC | 25 | 960 | | | | |

Double-winding Latching Type

| Rated Voltage | Rated current (mA) | | Coil resistance (Ω) | | Must set voltage | Must reset voltage | Max voltage | Power consumption (W) | |
|---------------|--------------------|------------|---------------------|------------|------------------|--------------------|-------------------|-----------------------|------------|
| | Set coil | Reset coil | Set coil | Reset coil | | | | Set coil | Reset coil |
| 5 VDC | 150 | | 33.3 | | 70% max. | 70% max. | 130% (at 23°C) | Approx. 0.75 | |
| 12 VDC | 62.5 | | 192 | | | | | Approx. 0.84 | |
| 24 VDC | 35 | | 686 | | | | | Approx. 0.84 | |

Note. The rated current and resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

●Contacts

| Load | Resistive load | |
|------------------------|-----------------------------------|--|
| Contact form | SPST-NO (1a) | SPDT (1c) |
| Contact type | Single | |
| Contact material | Ag Alloy (Cd free) | |
| Rated load | 16 A at 250 VAC 16 A at 24 VDC | 16 A at 250 VAC (N.O) 5 A at 250 VAC (N.C) 16 A at 24 VDC (N.O) 5 A at 24 VDC (N.C) |
| Rated carry current | 16 A | 16 A (N.O), 5A (N.C) |
| Max. switching voltage | 250 VAC, 24 VDC | |
| Max. switching current | 16 A | 16 A (N.O), 5 A (N.C) |

■Characteristics

| Item | Classification Relay function | SPST-NO (1a), SPDT (1c) |
|-------------------------------|---------------------------------------|---|
| | | Single-winding Latching, Double-winding Latching |
| Contact resistance *1 | | 100 mΩ max. |
| Set time | | 15 ms max. |
| Reset time | | 15 ms max. |
| Minimum pulse width *2 | | 30 ms |
| Maximum pulse width *2 | | 1 min |
| Insulation resistance *3 | | 1,000 MΩ min. |
| Dielectric strength | Between coil and contacts | 6,000 VAC, 50/60 Hz for 1 min |
| | Between contacts of the same polarity | 1,000 VAC, 50/60 Hz for 1 min |
| Impulse withstand voltage | Between coil and contacts | 10 kV (1.2 × 50 μs) |
| Vibration resistance | Destruction | 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) |
| | Malfunction | 10 to 45 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) at Set status 10 to 32 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) at Reset status (Except SPST-NO) |
| Shock resistance | Destruction | 1,000 m/s ² |
| | Malfunction | 150 m/s ² at Set status 50 m/s ² at Reset status (Except SPST-NO) |
| Durability | Mechanical *4 | 5,000,000 operations min. |
| | Electrical *4 | 50,000 operations min. |
| Ambient operating temperature | | -40° to 85°C (with no icing or condensation) |
| Ambient operating humidity | | 5% to 85% |
| Weight | | Approx. 10 g |

Note. Values in the above table are initial values.

*1. The contact resistance is measured with 1 A applied at 5 VDC using a fall-of-potential method.

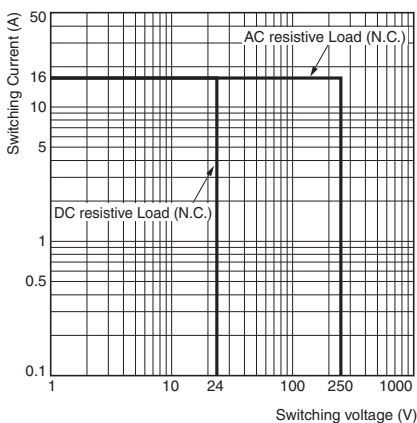
*2. These are measured at a coil temperature of 23°C and rated coil voltage.
Pulse duty factor should be 10% MAX.

*3. The insulation resistance is measured between coil and contacts and between contacts of same polarity at 500 VDC.

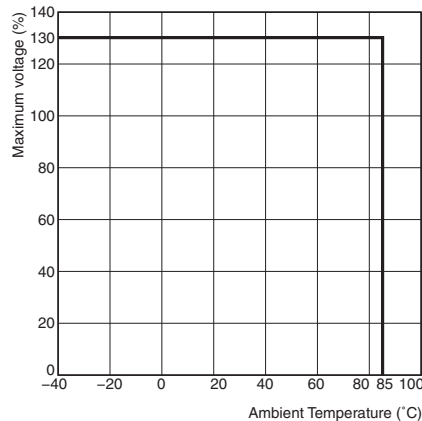
*4. Operated with input pulse width "30 ms".

■Engineering Data

●Maximum Switching Power

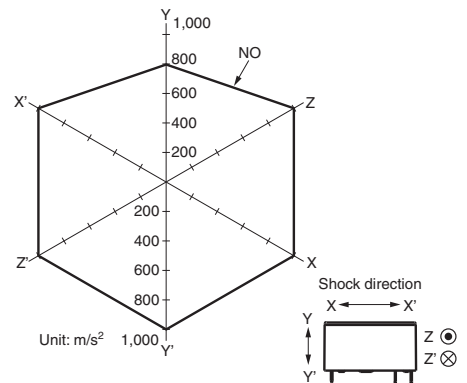


●Ambient Temperature vs. Maximum Coil Voltage



Note. Maximum voltage of Set pulse and Reset pulse at duty factor 10%.

●Malfunction Shock



Sample: G5RL-K1A-E 12VDC

No. of relays: 5 pcs

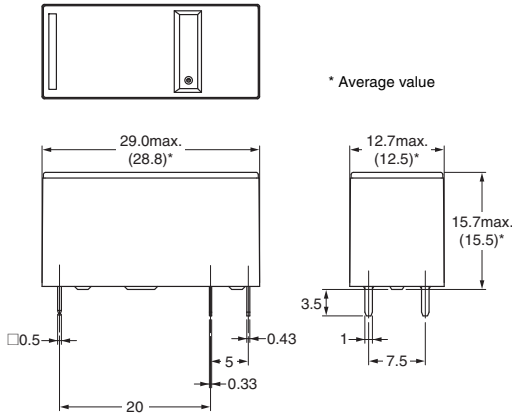
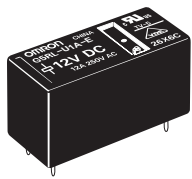
Test Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with Set and Reset status to check the number of contact malfunctions.

Standard value: 50 m/s² with Set status
100 m/s² with Reset status

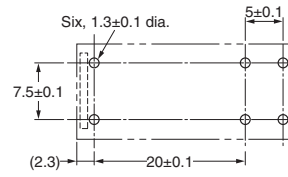
■Dimensions

(Unit: mm)

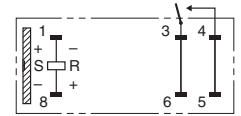
G5RL-U1A-E



PCB Mounting Holes (BOTTOM VIEW)

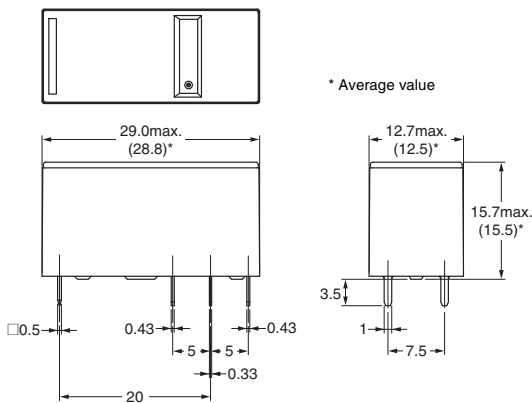
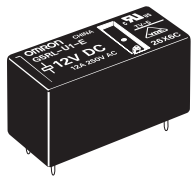


Terminal Arrangement/ Internal Connections (BOTTOM VIEW)

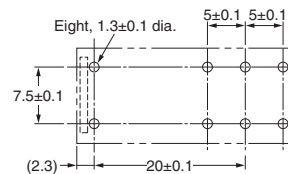


Note. Orientation marks are indicated as follows:

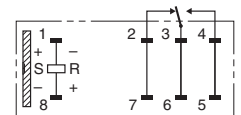
G5RL-U1-E



PCB Mounting Holes (BOTTOM VIEW)

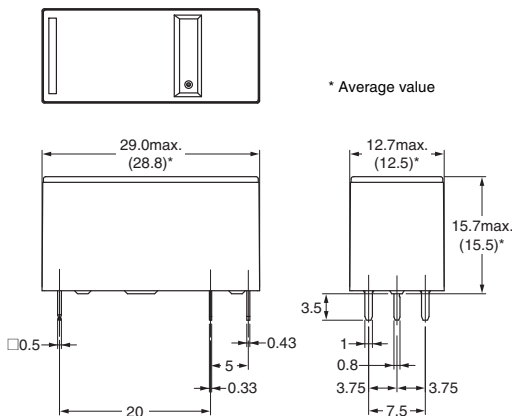
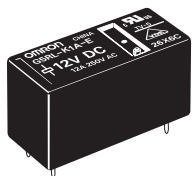


Terminal Arrangement/ Internal Connections (BOTTOM VIEW)

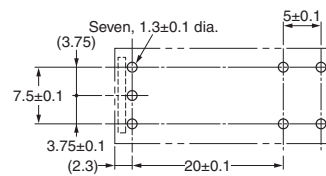


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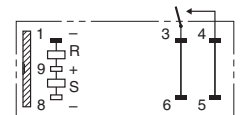
G5RL-K1A-E



PCB Mounting Holes (BOTTOM VIEW)

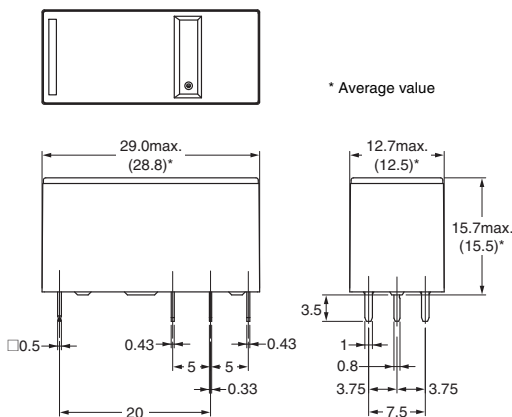
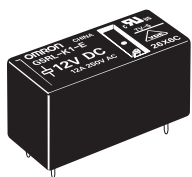


Terminal Arrangement/ Internal Connections (BOTTOM VIEW)

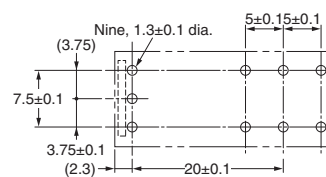


Note. Orientation marks are indicated as follows:

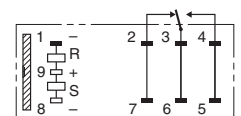
G5RL-K1-E



PCB Mounting Holes (BOTTOM VIEW)



Terminal Arrangement/ Internal Connections (BOTTOM VIEW)



Note. Orientation marks are indicated as follows:

Approved Standards

● UL Recognized (File No. E41643) and CSA Certified (File No. LR31928)

| Model | Contact form | Coil ratings | Contact ratings | Number of test operations |
|--------------------------|--------------|--------------|-------------------------------|---------------------------|
| G5RL-U1A-E G5RL-K1A-E | SPST-NO (1a) | 5 to 24 VDC | 16 A 277 VAC (Resistive) - NO | 50,000 |
| | | | TV-5 - NO | 25,000 |
| | | | TV-8 - NO | 25,000 |
| | | | 8 A 250 VAC (Ballast) - NO | 6,000 |
| | | | 2,000 W 250 VAC (Tungsten) | 6,000 |
| G5RL-U1-E G5RL-K1-E | SPDT (1c) | 5 to 24 VDC | 16 A 277 VAC (Resistive) - NO | 50,000 |
| | | | 8 A 250 VAC (Ballast) - NO | 6,000 |
| | | | 2,000 W 250 VAC (Tungsten) | 6,000 |
| | | | 5 A 250 VAC (General) - NC | 50,000 |

● VDE Certified (EN61810-1) (License No. 40007172)

| Model | Contact form | Coil ratings | Contact ratings | Number of test operations |
|--------------------------|--------------|---------------|--|---------------------------|
| G5RL-U1A-E G5RL-K1A-E | SPST-NO (1a) | 5, 12, 24 VDC | 16 A 250 VAC (cosφ=1) - NO | 30,000 |
| | | | 240 VAC 100 A (0-P) Steady 10 A (rms) - NO | 50,000 |
| G5RL-U1-E G5RL-K1-E | SPDT (1c) | 5, 12, 24 VDC | 16 A 250 VAC (cosφ=1) - NO | 30,000 |
| | | | 5 A 250 VAC (cosφ=1) - NC | 30,000 |

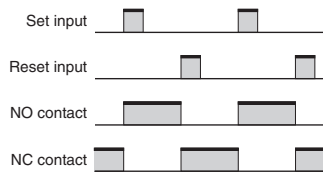
Precautions

● Please refer to “PCB Relays Common Precautions” for correct use.

Correct Use

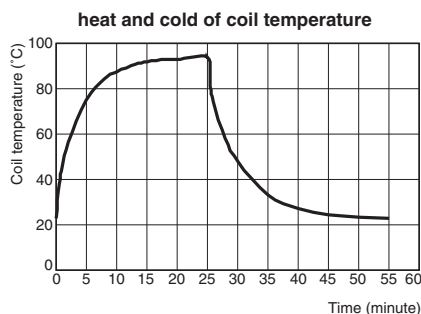
Basic Operation of Latching Relays

- In these Relays, the input pulse of the set coil causes the operating condition to be maintained magnetically or mechanically, whereas the input pulse to the reset coil side puts the Relay into the reset condition.



Coil Temperature Rise of long time continuous current to the coil

- When the coil is applied continuous current for a long time, the coil would be heat too much. Please decide the coil Input pulse width by “heat and cold of coil temperature”



Wiring of High-capacity Models (-E)

- High-capacity models (-E) have a structure that connects two terminals from one contact. When designing the circuit, use both terminals. If you use only one terminal, the Relay may be unable to satisfy specified performance.

Precautions for Correct Use

- This product is not suitable for vehicles such as automobiles (including two-wheeled vehicles).
- If the product is used in the following applications, consult your OMRON sales representative to check the necessary items according to the specification sheets. Also make sure the product is used within the specified ratings and performance ranges with an ample margin and implement safety measures, such as designing a safety circuit, to minimize danger should the product fail.
 - Outdoor use, uses involving potential chemical contamination or electrical interference.
 - Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, safety equipment, and equipment that could present a risk to human life or body.
 - Equipment requiring a high level of reliability, such as gas, water, or electrical supply systems.

● Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
 ● Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.