

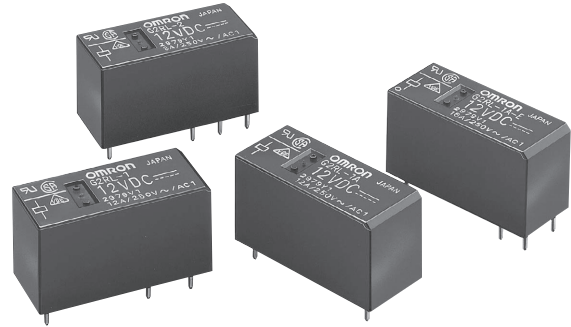
# G2RL

PCB Power Relay

## Low Profile Power Relay with 15.7 mm height, ideal for incorporation in miniature equipments



- A wide variety of single pole, double pole, high-capacity (16 A) type and high-sensitivity type (250 mW) Relays are available.
- Low profile; 15.7 mm max. in height.
- Conforms to VDE (EN61810-1), UL508 and CSA22.2.
- IEC/EN 60335-1 conformed. (-HA Model)
- Satisfies ambient operating temperature requirement of 85°C and 105°C (-CV Model).
- Clearance and creepage distance: 8 mm / 8 mm min.
- Coil insulation system: Class F (UL1446).



RoHS Compliant

### Model Number Legend

G2RL-□□□-□-□-□  
1 2 3 4 5 6

#### 1. Number of poles

- 1 : 1 pole
- 2 : 2 pole

#### 2. Contact Form

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

#### 3. Enclosure rating

- None : Flux protection
- 4 : Sealed

#### 4. Classification

- None : Standard
- E : High-capacity
- H : High-sensitivity

#### 5. Special Requirement

- None : Standard
- CV : 16 A, pinning 5 mm,; switching at 105°C

#### 6. Market Code

- None : General purpose
- HA : Home Appliance according to IEC/EN60335-1

### Application Examples

- Home appliances
- OA equipments
- Industrial machinery

G  
2  
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### Ordering Information

Terminal Shape	Market Code	Classification	Contact form	Enclosure rating	Model	Rated coil voltage	Minimum packing unit
PCB terminals	General purpose	Standard	SPST-NO (1a)	Flux protection	G2RL-1A	5 VDC 12 VDC 24 VDC 48 VDC	20 pcs/tube
				Sealed	G2RL-1A4		
			SPDT (1c)	Flux protection	G2RL-1		
				Sealed	G2RL-14		
			DPST-NO (2a)	Flux protection	G2RL-2A		
				Sealed	G2RL-2A4		
		DPDT (2c)	Flux protection	G2RL-2			
			Sealed	G2RL-24			
		High-capacity	SPST-NO (1a)	Flux protection	G2RL-1A-E		
				Sealed	G2RL-1A4-E		
			SPDT (1c)	Flux protection	G2RL-1-E		
				Sealed	G2RL-14-E		
	High-sensitivity		SPST-NO (1a)	Flux protection	G2RL-1A-E-CV		
			SPDT (1c)	Flux protection	G2RL-1A-H		
	Home Appliance	Standard	DPST-NO (2a)	Flux protection	G2RL-2A-HA	12 VDC 24 VDC	
				DPDT (2c)	G2RL-2-HA		
			SPST-NO (1a)	G2RL-1A-E-HA			
		High-capacity	SPST-NO (1a)	Flux protection	G2RL-1A-E-HA		
Sealed				G2RL-1-E-HA			
SPDT (1c)			Flux protection	G2RL-1-E-HA			

Note 1. When ordering, add the rated coil voltage to the model number.

Example: G2RL-1A 5 VDC

Rated coil voltage

Note 2. Place your order in tube (20 pcs/tube) units.

Note 3. Contact your OMRON sales representative for sealed models.

## ■ Ratings

### ● Coil

Item	Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
				% of rated voltage			
Standard	5 VDC	80.0	62.5	70% max.	10% min.	130% (at 85°C)	Approx. 400
	12 VDC	33.3	360				
	24 VDC	16.7	1,440				
	48 VDC	8.96	5,358				
High-sensitivity	12 VDC	20.8	576	75% max.			Approx. 430
	24 VDC	10.42	2,304				

Note 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

Note 2. The operating characteristics are measured at a coil temperature of 23°C.

Note 3. The "Max. voltage" is the maximum voltage that can be applied to the relay coil.

### ● Contacts

Item	Classification Model	Standard Models (resistive load)				High-capacity Models (resistive load)		High-sensitivity Models (resistive load)	
		G2RL-1A	G2RL-1	G2RL-2A	G2RL-2	G2RL-1A-E	G2RL-1-E (-CV)	G2RL-1A-H	G2RL-1-H
Contact type		Single							
Contact material		Ag-alloy (Cd free)							
Rated load		12 A at 250 VAC 12 A at 24 VDC (See note)		8 A at 250 VAC 8 A at 30 VDC (See note)		16 A at 250 VAC 16 A at 24 VDC (See note)		10 A at 250 VAC (See note)	
Rated carry current		12 A (See note)		8 A (70°C)/5 A (85°C) (See note)		16 A (See note)		10 A (See note)	
Max. switching voltage		440 VAC, 300 VDC							
Max. switching current		12 A		8 A		16 A		10 A	
Failure rate (P level) (reference value*)		40 mA at 24 VDC							

\* This value was measured at a switching frequency of 120 operations/min.

Note: Contact your OMRON representative for the ratings on sealed models.

## ■ Characteristics

Item	Classification Number of poles	Standard Models		High-capacity Models	High-sensitivity Models
		1-pole	2-pole	1-pole	
Contact resistance *1		100 mΩ max.			
Operate (set) time		15 ms max.			
Release (reset) time		5 ms max.			
Insulation resistance *2		1,000 MΩ min.			
Dielectric strength	Between coil and contacts	5,000 VAC, 50/60 Hz for 1min			
	Between contacts of the same polarity	1,000 VAC, 50/60 Hz for 1min			
	Between contacts of different polarity	–	2,500 VAC, 50/60 Hz for 1min	–	
Impulse withstand voltage		10 kV (1.2 x 50 μs)			
Vibration resistance	Destruction	10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)			
	Malfunction	10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)			
Shock resistance	Destruction	1,000 m/s <sup>2</sup>			
	Malfunction	Energized: 100 m/s <sup>2</sup> , De-energized: 100 m/s <sup>2</sup>			
Durability	Mechanical	20,000,000 operations (at 18,000 operations/hr)			
	Electrical *3 (resistive load)	G2RL-1(A): 50,000 operations at 250 VAC, 12 A 30,000 operations at 24 VDC, 12 A	G2RL-2(A): 30,000 operations at 250 VAC, 8 A 30,000 operations at 30 VDC, 8 A	G2RL-1(A)-E: 30,000 operations at 250 VAC, 16 A 30,000 operations at 24 VDC, 16 A G2RL-1A-E-CV: 50,000 operations at 250 VAC, 16 A at 105°C	G2RL-1(A)-H: 50,000 operations at 250 VAC, 10 A
Ambient operating temperature		-40°C to 85°C (with no icing or condensation)			
Ambient operating humidity		-40°C to 105°C (with no icing or condensation) by G2RL-1A-E-CV			
Weight		5% to 85% (with no icing or condensation)			
		Approx. 12 g			

Note. Values in the above table are the initial values at 23°C.

\*1. Measurement conditions: 5 VDC, 1 A, voltage drop method

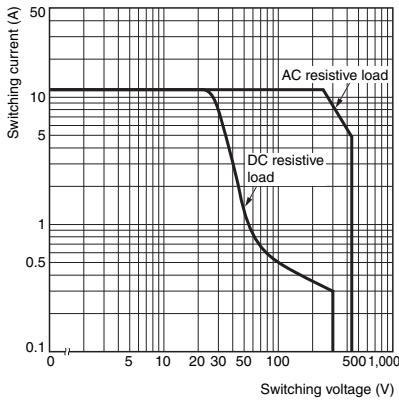
\*2. Measurement conditions: Measured at the same points as the dielectric strength using a 500 VDC ohmmeter.

\*3. 1,800 operations per hour.

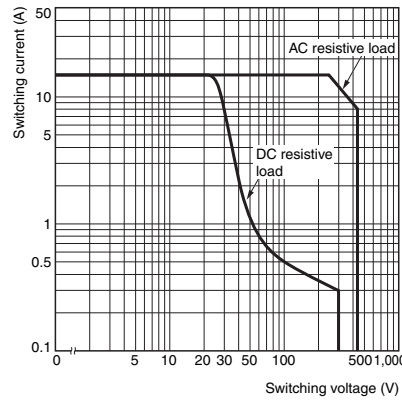
## Engineering Data

### Maximum Switching Capacity

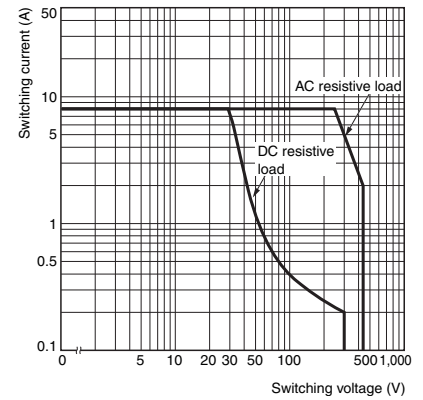
#### G2RL-1A, G2RL-1



#### G2RL-1A-E, G2RL-1-E

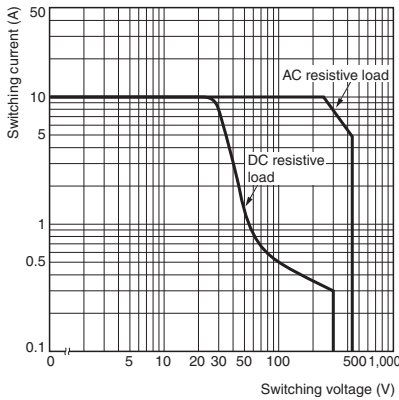


#### G2RL-2A, G2RL-2

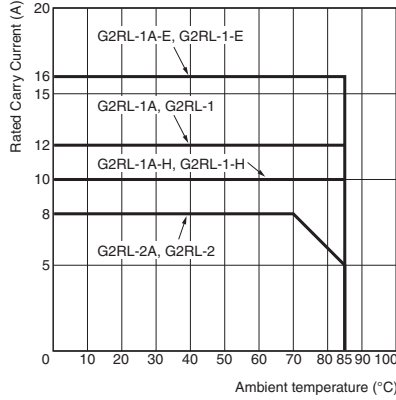


### High-sensitivity models

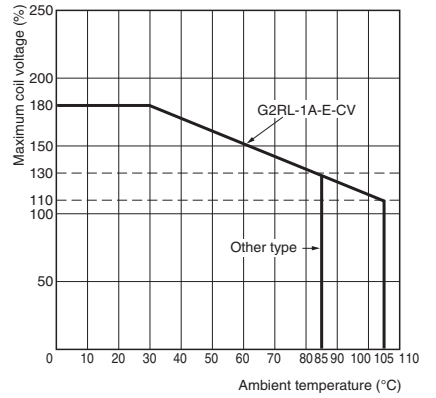
#### G2RL-1A-H, G2RL-1-H



### Ambient Temperature vs. Rated Carry Current

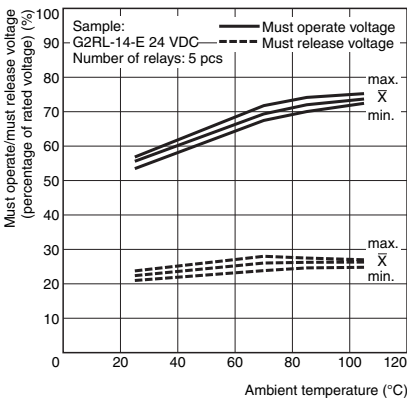


### Ambient Temperature vs. Maximum Coil Voltage



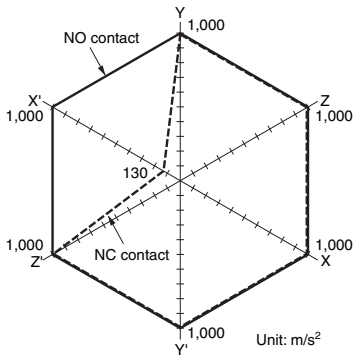
Note. The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

### Ambient Temperature vs. Must Operate and Must Release Voltages

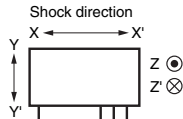


## ● Shock Malfunction

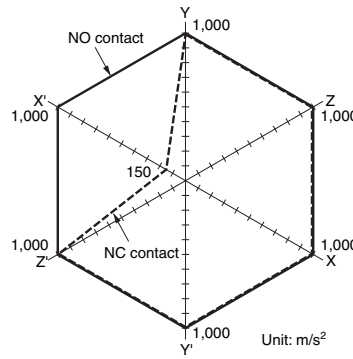
### G2RL-1 (A)-E



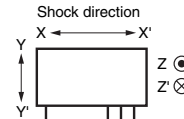
Sample: G2RL-14 12 VDC  
 Number of Relays: 5 pcs  
 Test conditions: Shock is applied in  $\pm X$ ,  $\pm Y$ , and  $\pm Z$  directions three times each with without energizing the Relays to check the number of malfunctions.  
 Requirement: None malfunction  
 100 m/s<sup>2</sup>



### G2RL-2 (A)



Sample: G2RL-24 12 VDC  
 Number of Relays: 5 pcs  
 Test conditions: Shock is applied in  $\pm X$ ,  $\pm Y$ , and  $\pm Z$  directions three times each with without energizing the Relays to check the number of malfunctions.  
 Requirement: None malfunction  
 100 m/s<sup>2</sup>



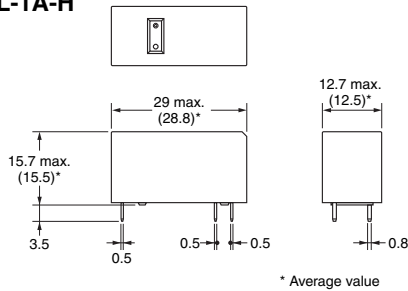
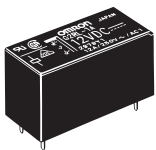
## ■ Electrical Endurance Data (Reference Value)

G2RL-1	5 A 250 VAC (cosφ=1)	150,000 operations nim. (N.O.)
	5 A 24 VDC (L/R=7 ms)	20,000 operations nim. (N.O.)
G2RL-1-E	8 A 250 VAC (cosφ=1)	200,000 operations nim. (N.O.)
	8 A 24 VDC (L/R=7 ms)	10,000 operations nim. (N.O.)
	Pilot duty (A300), 250 VAC	250,000 operations nim. (N.O.)
	Pilot duty (A300), 125 VAC	150,000 operations nim. (N.O.)

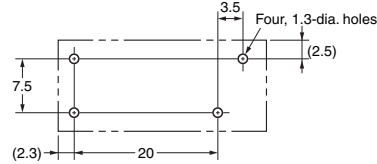
Note. The results shown reflect values at ambient temperature 23°C. Electrical endurance will vary depending on the test conditions.  
 Contact your OMRON representative if you require more detailed information for the electrical endurance under your test condition.

## ■ Dimensions (Unit: mm)

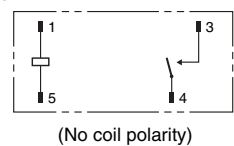
### G2RL-1A, G2RL-1A4, G2RL-1A-H



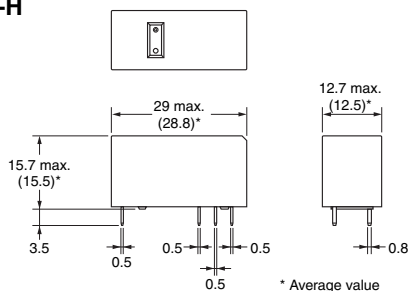
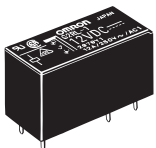
#### PCB Mounting Holes (Bottom View)



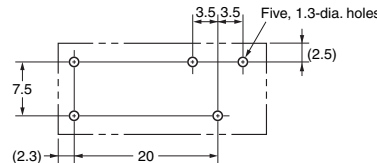
#### Terminal Arrangement/ Internal Connections (Bottom View)



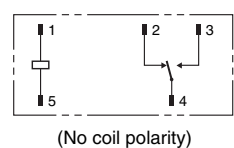
### G2RL-1, G2RL-14, G2RL-1-H



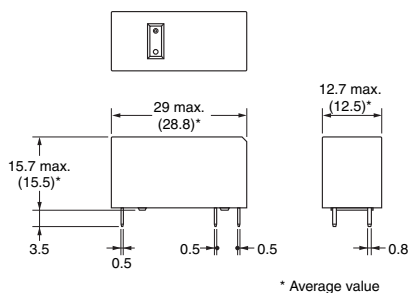
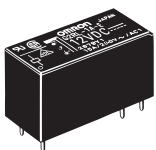
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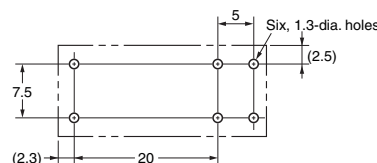
#### Terminal Arrangement/ Internal Connections (Bottom View)



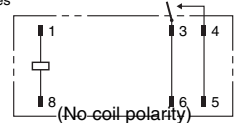
### G2RL-1A-E (-HA), G2RL-1A4-E, G2RL-1A-E-CV



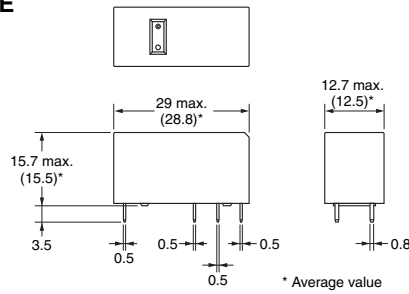
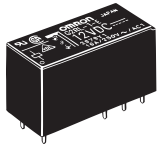
#### PCB Mounting Holes (Bottom View)



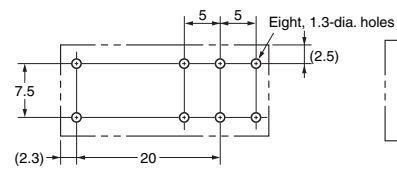
#### Terminal Arrangement/ Internal Connections (Bottom View)



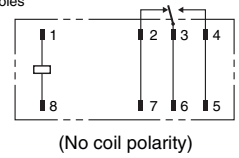
## G2RL-1-E (-HA), G2RL-14-E



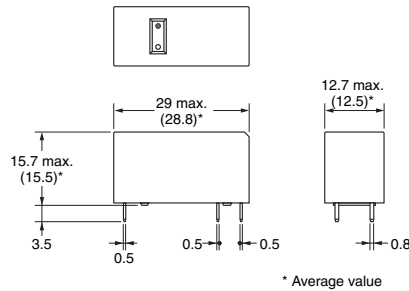
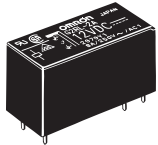
### PCB Mounting Holes (Bottom View)



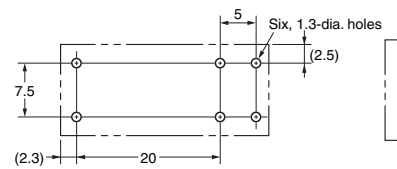
### Terminal Arrangement/ Internal Connections (Bottom View)



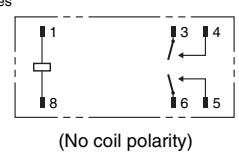
## G2RL-2A (-HA), G2R-2A4



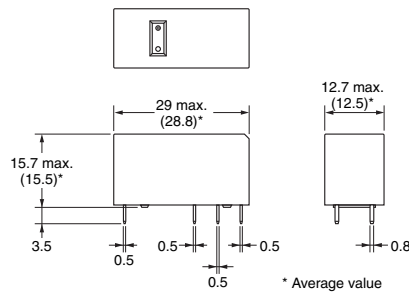
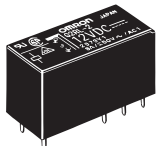
### PCB Mounting Holes (Bottom View)



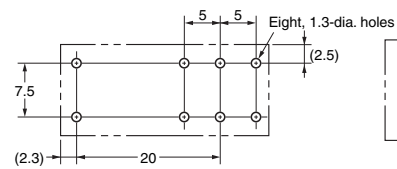
### Terminal Arrangement/ Internal Connections (Bottom View)



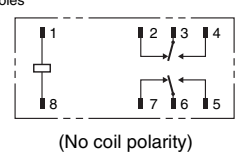
## G2RL-2 (-HA), G2R-24



### PCB Mounting Holes (Bottom View)



### Terminal Arrangement/ Internal Connections (Bottom View)



## Approved Standards

- The approval rating values for overseas standards are different from the performance values determined individually. Confirm the values before use.

**UL Recognized:** (File No. 41643)

**CSA Certified:** (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G2RL-1A	SPST-NO (1a)	3 to 48 VDC	12 A, 250 VAC (General Use) 40°C	100,000
G2RL-1	SPDT (1c)		12 A, 24 VDC (Resistive) 40°C	50,000
G2RL-1A-E (-HA)	SPST-NO (1a)		16 A, 250 VAC (General Use) 40°C	100,000
G2RL-1-E (-HA)	SPDT (1c)		16 A, 24 VDC (Resistive) 40°C	50,000
G2RL-1A-E-CV	SPST-NO (1a)		16 A, 250 VAC (Resistive) 105°C	100,000
G2RL-1A-H	SPST-NO (1a)		10 A, 250 VAC (General Use) 40°C	50,000
G2RL-1-H	SPDT (1c)		10 A, 24 VDC (Resistive) 40°C	
G2RL-2A (-HA)	DPST-NO (2a)		8 A, 277 VAC (General Use) 40°C	100,000
G2RL-2 (-HA)	DPDT (2c)	8 A, 30 VDC (Resistive) 40°C		

EN/IEC, VDE Certified  (Registration No. 119650)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G2RL-1A	SPST-NO (1a)	3 to 48 VDC	12 A, 250 VAC (cosφ=1) 85°C 12 A, 24 VDC (L/R=0 ms) 85°C	100,000
G2RL-1	SPDT (1c)		AC15: 3 A at 240 VAC at room temperature DC13: 2.5 A at 24 VDC, 50ms at room temperature	6,000
G2RL-1A-E (-HA)	SPST-NO (1a)		16 A, 250 VAC (cosφ=1) 85°C 16 A, 24 VDC (L/R=0 ms) 85°C	30,000 15,000
G2RL-1-E (-HA)	SPDT (1c)		AC15: 3 A at 240 VAC (NO) at room temperature, 1.5 A at 240V AC (NC) at room temperature DC13: 2.5 A at 24 VDC (NO), 50ms at room temperature	6,000
G2RL-1A-E-CV	SPST-NO (1a)		16 A, 250 VAC (cosφ=1) 105°C	100,000
G2RL-1A-H G2RL-1-H	SPST-NO (1a)		10 A, 250 VAC (cosφ=1) 85°C	50,000
	SPDT (1c)		10 A, 250 VAC (cosφ=1) 40°C	100,000
			10 A, 24 VDC (L/R=0 ms) 85°C	50,000
G2RL-2A (-HA)	DPST-NO (2a)		8 A, 250 VAC (cosφ=1) 85°C	30,000
			8 A, 30 VDC (L/R=0 ms) 85°C	15,000
G2RL-2 (-HA)	DPDT (2c)		AC15: 1.5 A at 240VAC at room temperature DC13: 2 A at 30 VDC, 50ms at room temperature	6,000

Clearance distance	8 mm min.
Creepage distance	8 mm min.
Insulation material group	IIIa
Type of insulation coil-contact circuit open contact circuit	Reinforced Micro disconnection
Rated Insulation voltage	250 V
Pollution degree	3 (Flux protection) / 2 (Sealed)
Rated voltage system	250 V / 400 V (Fully sealed ONLY)
Over voltage category	III
Category of protection according to IEC 61810-1	RT II (Flux protection) / RT III (Sealed)
Glow wire according to IEC 60335-1	<HA Models only> GWT 750°C min. (IEC 60695-2-11) / GWF1 850°C min. (IEC 60695-2-12)
Tracking resistance according to IEC 60112	PTI 250 V min. (housing parts)

## ■ Precautions

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

### Correct Use

#### ● Mounting Position Compared to G2R Model

- Although the G2RL model and the G2R model are both low profile Relays, their characteristics such as switching capacity are different. Be sure to check operation under the actual operating conditions before use.

#### ● Cleaning

- The G2RL model is flux-resistant with two sealing holes on the case. Thus, do not clean the Relay by boiling or soaking in water. Consult your Omron sales representative for sealed type Relay.

#### ● Using Relays in an Atmosphere Containing Corrosive Gas

- Do not use Relays in an atmosphere containing corrosive gas (sulfuric or organic gas). Otherwise, connection failure due to corrosion on the contact surface may lead to functional faults.

• 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.**