

# PCB Relay G2RL

## A Power Relay with Various Models

- High-sensitivity (250 mW) and High-capacity (16 A) versions.
- Designed for cooking and HVAC controls: blower motor, damper, active air purification, duct flow boost fans, etc.
- Conforms to VDE (EN61810-1). UL recognized/ CSA certified
- Meets EN60335-1 requirements for household products.
- Clearance and creepage distance: 10 mm/10 mm.
- Tracking resistance: CTI>250
- Coil Insulation system: Class F.
- RoHS Compliant



## Ordering Information

Classification	Enclosure ratings	Contact form			
		SPST-NO	SPDT	DPST-NO	DPDT
General-purpose	Flux protection	G2RL-1A	G2RL-1	G2RL-2A	G2RL-2
	Fully sealed	G2RL-1A4	G2RL-14	G2RL-2A4	G2RL-24
High-capacity	Flux protection	G2RL-1A-E	G2RL-1-E	---	---
	Fully sealed	G2RL-1A4-E	G2RL-14-E	---	---
High-sensitivity	Flux protection	G2RL-1A-H	G2RL-1-H	---	---

**Note:** When ordering, add the rated coil voltage to the model number.  
 Example: G2RL-1A DC12

Rated coil voltage

## Model Number Legend

G2RL-□□□-□  
 1 2 3 4

### 1. Number of Poles

- 1: 1 pole
- 2: 2 poles

### 2. Contact Form

- None: □PDT
- A: □PST-NO

### 3. Enclosure Ratings

- None: Flux protection
- 4: Fully sealed

### 4. Classification

- None: General purpose
- E: High capacity (1 pole)
- H: High sensitivity (1 pole)

## Specifications

### Coils Ratings for General-purpose and High-capacity Models

Rated voltage	5 VDC	12 VDC	24 VDC	48 VDC
Rated current	80.0 mA	33.3 mA	16.7 mA	8.96 mA
Coil resistance	62.5 Ω	360 Ω	1,440 Ω	5,358 Ω
Must operate voltage	70% max. of the rated voltage			
Must release voltage	10% min. of the rated voltage			
Max. voltage	180% of rated voltage (at 23°C)			
Power consumption	Approx. 400 mW			Approx. 430 mW

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

## ■ Coils Ratings for High-sensitivity Models

Rated voltage	5 VDC	12 VDC	24 VDC
Rated current	50.0 mA	20.8 mA	10.42 mA
Coil resistance	100 $\Omega$	576 $\Omega$	2,304 $\Omega$
Must operate voltage	75% max. of the rated voltage		
Must release voltage	10% min. of the rated voltage		
Max. voltage	180% of rated voltage (at 23°C)		
Power consumption	Approx. 250 mW		

**Note:** The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of  $\pm 10\%$ .

## ■ Contact Ratings

Item	General-purpose Models		High-capacity Models	High-sensitivity Models
Number of poles	1 pole	2 poles	1 pole	1 pole
Contact material	Ag Alloy (Cd free)			
Load	Resistive load ( $\cos\phi=1$ )			
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 30 VDC (See note.)	10 A at 250 VAC 10 A at 24 VDC (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
Max. switching power	3,000 VA (4,000 VA)	2,000 VA	4,000 VA	2,500 VA

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

## ■ Characteristics

Item	General-purpose (High-capacity) Models	General-purpose Models	High-sensitivity Models
Number of poles	1 pole	2 pole	1 pole
Contact resistance	100 m $\Omega$ max.		
Operate (set) time	15 ms max.		
Release (reset) time	5 ms max.		
Max. operating frequency	Mechanical: 18,000 operation/hr Electrical: 1,800 operation/hr at rated load		
Insulation resistance	1,000 M $\Omega$ min. (at 500 VDC)		
Dielectric strength	5,000 VAC, 1 min between coil and contacts 1,000 VAC, 1 min between contacts of same polarity	5,000 VAC, 1 min between coil and contacts 2,500 VAC, 1 min between contacts of different polarity 1,000 VAC, 1 min between contacts of same polarity	5,000 VAC, 1 min between coil and contacts 1,000 VAC, 1 min between contacts of same polarity
Impulse withstand voltage	10 kV (1.2 $\times$ 50 $\mu$ s) between coil and contact		
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> (approx. 100 G) Malfunction: 100 m/s <sup>2</sup> (approx. 10 G)		
Endurance (Mechanical)	20,000,000 operations (at 18,000 operations/hr)		
Ambient temperature	Operating: -40°C to 85°C (with no icing) Storage: -40°C to 85°C (with no icing)		
Ambient humidity	5% to 85%		
Weight	Approx. 12 g		

**Note:** Values in the above table are the initial values.

## ■ Approved Standards

UL Recognized (File No. E41643) / CSA Certified (File No. LR31928) -- Ambient Temp. = 40°C

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G2RL-1A	SPST-NO	3 to 48 VDC	12 A at 250 VAC (General use)	100,000
G2RL-1	SPDT		12 A at 24 VDC (Resistive)	50,000
G2RL-1A-E	SPST-NO	3 to 48 VDC	16 A at 250 VAC (General use)	100,000
G2RL-1-E	SPDT		16 A at 24 VDC (Resistive)	50,000
G2RL-1A-H	SPST-NO	5 to 24 VDC	10 A at 250 VAC (General use)	50,000
G2RL-1-H	SPDT		10 A at 24 VDC (Resistive)	
G2RL-2A	DPST-NO	3 to 48 VDC	8 A at 277 VAC (General use)	100,000
G2RL-2	DPDT		8 A at 30 VDC (Resistive)	

**Note:** Consult Omron for additional UL / CSA ratings

VDE (EN61810-1) (License No. 119650)

Model	Contact form	Coil ratings	Contact ratings
G2RL-1(A)	1 pole	5, 12, 18, 22, 24, 48 VDC	12 A at 250 VAC ( $\cos\phi=1$ ) 12 A at 24 VDC (L/R=0 ms) AC15: 3 A at 240 VAC DC13: 2.5 A at 24 VDC, 50 ms
G2RL-1(A)-E	1 pole	5, 12, 18, 22, 24, 48 VDC	16 A at 250 VAC ( $\cos\phi=1$ ) 16 A at 24 VDC (L/R=0 ms) AC15: 3 A at 240 VAC (NO) 1.5 A at 240 VAC (NC) DC13: 2.5 A at 24 VDC (NO), 50 ms
G2RL-1(A)-H	1 pole	5, 9, 12, 24 VDC	10 A at 250 VAC ( $\cos\phi=1$ ) 10 A at 24 VDC (L/R=0 ms)
G2RL-2(A)	2 poles	5, 12, 18, 22, 24, 48 VDC	8 A at 250 VAC ( $\cos\phi=1$ ) 8 A at 24 VDC (L/R=0 ms) AC15: 1.5 A at 240 VAC DC13: 2 A at 30 VDC, 50 ms

**Note:** To achieve approved life cycles on sealed models, the relay should be vented by removing the "knock off vent nib" on top of relay case after the soldering/washing process.

## Electrical Life Data

<b>G2RL-1-E</b>	16 A at 250 VAC ( $\cos\phi=1$ ) 16 A at 24 VDC 8 A at 250 VAC ( $\cos\phi=0.4$ ) 8 A at 30 VDC (L/R=7 ms)	30,000 operations min. 30,000 operations min. 200,000 operation min. (normally open side operation) 10,000 operation min. (normally open side operation)
<b>G2RL-1</b>	12 A at 250 VAC ( $\cos\phi=1$ ) 12 A at 24 VDC 5 A at 250 VAC ( $\cos\phi=0.4$ ) 5 A at 30 VDC (L/R=7 ms)	50,000 operations min. 30,000 operations min. 150,000 operation min. (normally open side operation) 20,000 operation min. (normally open side operation)
<b>G2RL-1-H</b>	10 A at 250 VAC ( $\cos\phi=1$ ) 10 A at 24 VDC	100,000 operations min. 50,000 operations min.
<b>G2RL-2</b>	8 A at 250 VAC ( $\cos\phi=1$ ) 8 A at 30 VDC	30,000 operations min. 30,000 operations min.

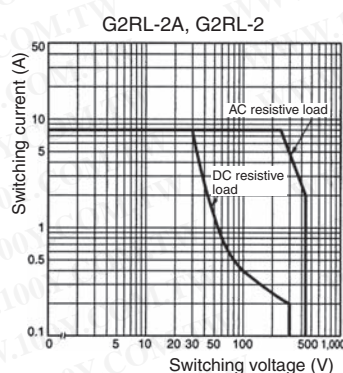
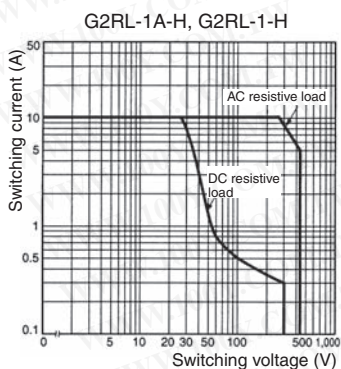
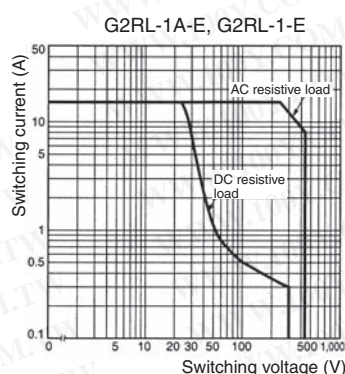
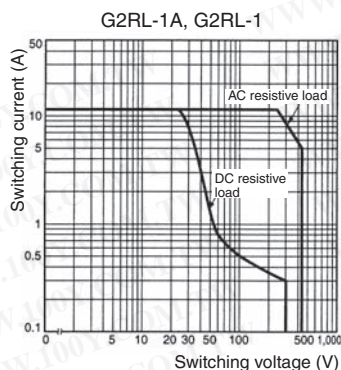
**Note:** 1. The results shown reflect values measured using very severe test conditions i.e., Duty: 1 s ON/1 s OFF.

2. In order to obtain the full rated life cycles on the fully sealed models, the relay should be properly vented by removing the "knock off vent nib" on top of the relay case after the soldering/washing process.

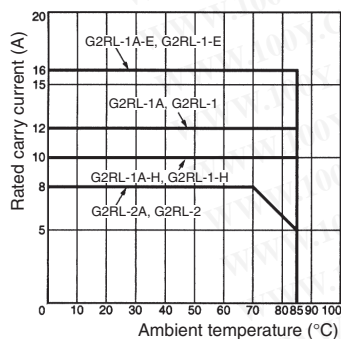
3. Electrical endurance will vary depending on the test conditions. Contact your OMRON representative if you require more detailed information for the electrical endurance under your test conditions.

# Engineering Data

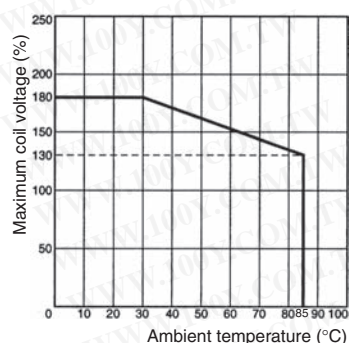
## Maximum Switching Capacity



## 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.

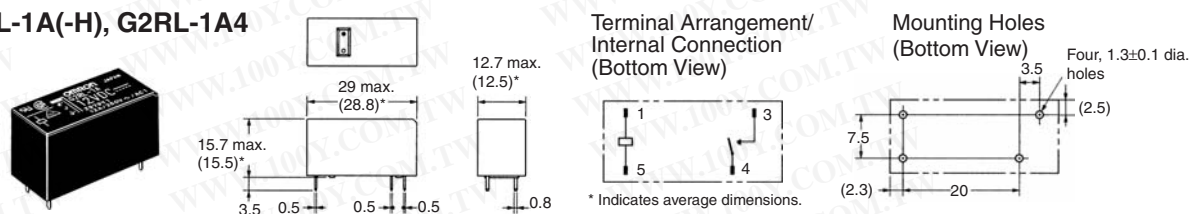
**Note:** Contact your OMRON representative for the data on fully sealed models.



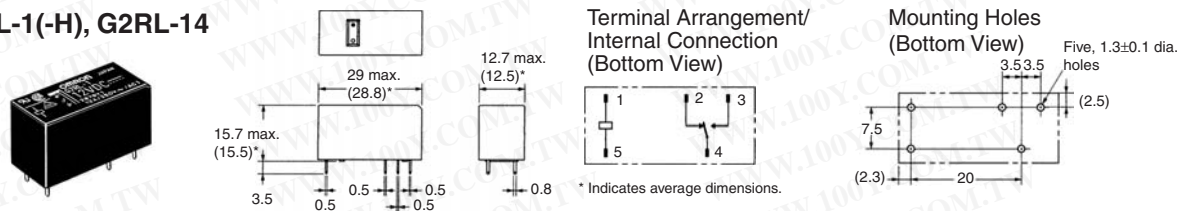
# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

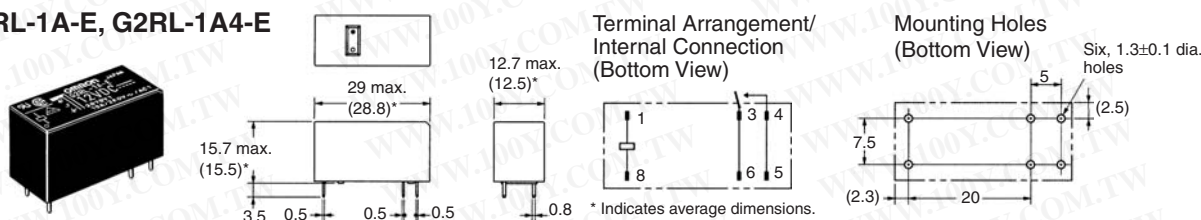
## G2RL-1A(-H), G2RL-1A4



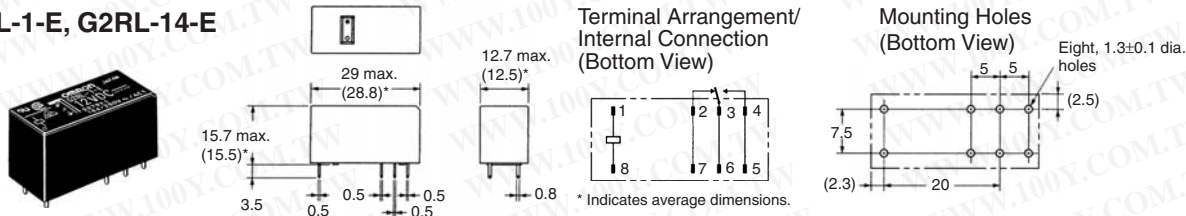
## G2RL-1(-H), G2RL-14



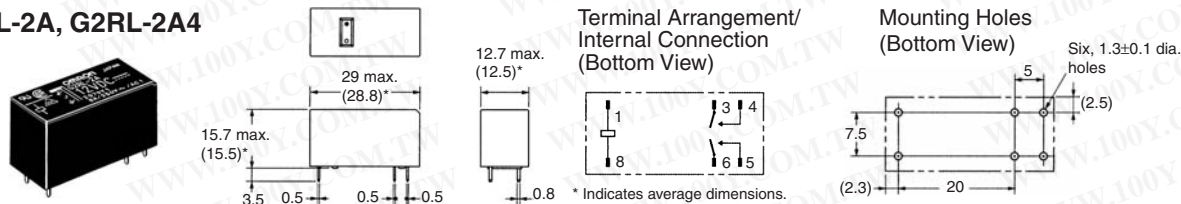
## G2RL-1A-E, G2RL-1A4-E



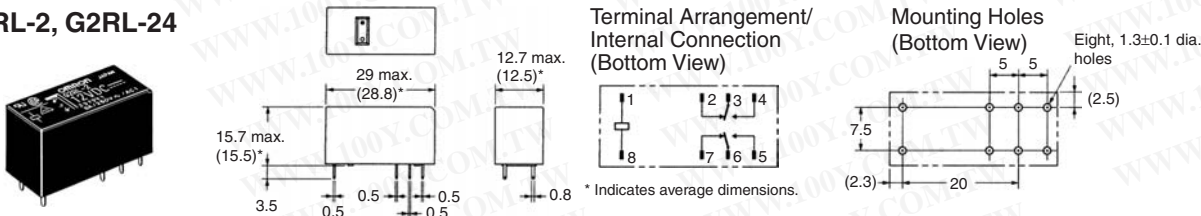
## G2RL-1-E, G2RL-14-E



## G2RL-2A, G2RL-2A4



## G2RL-2, G2RL-24



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# Omron Electronic Components, LLC

## Terms and Conditions of Sales

### I. GENERAL

- Definitions:** The words used herein are defined as follows.
  - Terms:** These terms and conditions
  - Seller:** Omron Electronic Components LLC and its subsidiaries
  - Buyer:** The buyer of Products, including any end user in section III through VI
  - Products:** Products and/or services of Seller
  - Including:** Including without limitation
- Offer/Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- Distributor:** Any distributor shall inform its customer of the contents after and including section III of these Terms.

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- Prices/Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at the time the purchase order is accepted by Seller. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
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- Orders:** Seller will accept no order less than 200 U.S. dollars net billing.
- Currencies:** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals:** Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes:** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
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- Force Majeure:** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
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  - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
  - Delivery and shipping dates are estimates only; and
  - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier or any claim related to pricing or other charges must be presented in detail in writing to Seller within 30 days of receipt of shipment.

### III. PRECAUTIONS

- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
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  - Outdoor use, use involving potential chemical contamination or electrical interference.

- Use in consumer Products or any use in significant quantities.
  - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - Systems, machines, and equipment that could present a risk to life or property.
- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
  - Motorized Vehicle Application:** USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.
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### IV. WARRANTY AND LIMITATION

- Warranty:** Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER WARRANTIES, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS.
- Buyer Remedy:** Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller's analysis confirms that the Products were correctly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment.
- Limitation on Liability:** SELLER AND ITS AFFILIATES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL LIABILITY OF SELLER OR ITS AFFILIATES EXCEED THE INDIVIDUAL PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.
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- Performance Data:** Performance data is provided as a guide in determining suitability and does not constitute a warranty. It may represent the result of Seller's test conditions, and the users must correlate it to actual application requirements.
- Change In Specifications:** Product specifications and descriptions may be changed at any time based on improvements or other reasons. It is Seller's practice to change part numbers when published ratings or features are changed, or when significant engineering changes are made. However, some specifications of the Product may be changed without any notice.
- Errors And Omissions:** The information on Seller's website or in other documentation has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.
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- Amendment:** These Terms constitute the entire agreement between Buyer and Seller relating to the Products, and no provision may be changed or waived unless in writing signed by the parties.
- Severability:** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision.



# Certain Precautions on Specifications and Use

- 1. Suitability for Use.** Seller shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in Buyer's application or use of the Product. At Buyer's request, Seller will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
  - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
  - (ii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - (iii) Use in consumer products or any use in significant quantities.
  - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
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- 5. Errors and Omissions.** The information in this publication has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors, or omissions.
- 6. RoHS Compliance.** Where indicated, our products currently comply, to the best of our knowledge as of the date of this publication, with the requirements of the European Union's Directive on the Restriction of certain Hazardous Substances ("RoHS"), although the requirements of RoHS do not take effect until July 2006. These requirements may be subject to change. Please consult our website for current information.

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## ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

# OMRON

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