

# PCB Relay

## G2RL

### High Capacity, Low Profile Relay

- Designed for cooking and HVAC controls: blower motor, damper, active air purification, duct flow boost fans, etc.
- 10 kV impulse surge withstand.
- Available in traditional full PCB mounting or with PCB coil driving terminals with quick connect (5 or 7.5 mm) contact load terminals.
- Provides high circuit insulation, with minimum 10 mm both creepages and clearances (8 mm for -1APT type).
- Meets EC required tracking resistance of CTI > 250.
- Class-F coil insulation standard. For high temperature appliance and HVAC applications, the -1APT type is related to 16A @ 250 VAC @105°C for 100K operations.
- Low 400 mW coil power consumption.
- UL, CSA and VDE approved.



### Ordering Information

Classification		Enclosure ratings	Contact form			
			SPST-NO	SPDT	DPST-NO	DPDT
			Model			
Class-F	General-purpose	Flux protection	G2RL-1A	G2RL-1	G2RL-2A	G2RL-2
		Fully sealed	G2RL-1A4	G2RL-14	G2RL-2A4	G2RL-24
	High-capacity (-E)	Flux protection	G2RL-1A-E	G2RL-1-E	---	---
		Fully sealed	G2RL-1A4-E	G2RL-14-E	---	---
QC contact terminal		Flux protected	G2RL-1APT-E	---	---	---

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

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-34970699  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

### MODEL NUMBER LEGEND

G2RL-□□□-□-□  
 1 2 3 4 5

#### 1. Number of Poles

- 1: 1 pole  
 2: 2 poles

#### 2. Contact Form

- None: □PDT  
 A: □PST-NO

#### 3. Enclosure Ratings

- None: Flux protection (vented)  
 TP: Flux protection with quick-connect contact/load terminals (fully sealed in development)  
 4: Fully sealed (with "knock off vent nib")

#### 4. Classification

- None: General purpose (not in -1APT type)  
 E: High capacity (1 pole)

#### 5. Approved Standards

- None: UL, CSA, VDE, UL Class F Insulation

# Specifications

## ■ COIL RATINGS

Rated voltage		5 VDC	12 VDC	24 VDC	48 VDC
Rated current		80.0 mA	33.33 mA	16.7 mA	8.96 mA
Coil resistance		62.5 $\Omega$	360 $\Omega$	1,440 $\Omega$	5,358 $\Omega$
Coil inductance (H) (ref. value)	Armature OFF	0.18	1.01	4.19	15.91
	Armature ON	0.44	2.47	9.72	33.65
Must operate voltage	70% max. of the rated voltage				
Must release voltage	10% min. of the rated voltage				
Max. voltage	130% of the rated voltage (at 85°C; 105°C for -1APT type)				
Power consumption	Approx. 400 mW				Approx. 430 mW

## ■ CONTACT RATINGS

Number of poles	1 pole	2 poles
Contact material	AgSnO <sub>2</sub>	AgNi
Load	Resistive load ( $\cos\phi=1$ )	Resistive load ( $\cos\phi=1$ )
Rated load	12 A (16 A) at 250 VAC 12 A (16 A) at 24 VDC	8 A at 250 VAC 8 A at 30 VDC
Rated carry current	12 A (16 A)	8 A (70°C)/5 A (85°C)
Max. operating voltage	440 VAC, 300 VDC	
Max. operating current	12 A (16 A)	8 A
Max. switching power	3,000 VA (4,000 VA), 288 W (384 W)	2,000 VA, 240 W
Minimum load	40 mA @ 24 VDC (vented)	20 mA @ 24 VDC (sealed)

**Note:** Values in parentheses are those for the high-capacity and quick connect models.

## ■ CHARACTERISTICS

Item	1 pole	2 poles
Contact resistance	100 m $\Omega$ max.	
Operate (set) time	Approx. 7 ms	
Release (reset) time	Approx. 2 ms	
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	5,000 VAC, 1 min between coil and contacts
	1,000 VAC, 1 min between contacts of same polarity	2,500 VAC, 1 min between contacts of different polarity 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 Hz, 1.5-mm double amplitude Malfunction: 10 to 55 Hz, 1.5-mm double amplitude	
Shock resistance	Destruction: 1,000 m/s <sup>2</sup> Malfunction: Energized: 100 m/s <sup>2</sup> Not energized: 100 m/s <sup>2</sup>	
Life expectancy (Mechanical)	20,000,000 operations (at 18,000 operations/hr)	
Ambient temperature	Operating: -40°C to 85°C (with no icing) (G2RL-1APT 105°C max) Storage: -40°C to 85°C (with no icing)	
Ambient humidity	35% to 85%	
Weight	Approx. 12 g	
Packaging	Standard: 20 relays/stick -1APT: 40 relays/tray	

## ■ APPROVED STANDARDS

UL508 (File No. E41643)/CSA C22.2 (No.14) (File No. LR31928)

Part number	Contact form	Coil ratings	Contact ratings
G2RL-1A	SPST-NO	3 to 48 VDC	12 A at 250 VAC (General use), 100k ops. 12 A at 24 VDC (Resistive), 50k ops. 1/3 hp, 120 VAC, 30k ops., 60°C
G2RL-1	SPDT		
G2RL-1A-E	SPST-NO (High capacity)		16 A at 250 VAC (General use), 100k ops. 16 A at 24 VDC (Resistive), 50k ops. 20 A at 240 VAC (General use), 85°C 15 A at 240 VAC (General use), 105°C 1/2 hp, 120 VAC, 100k ops., 70°C (NO)
G2RL-1ATP-E	SPST-NO (QC contact terminals)	DC12, DC24	16 A at 250 VAC (Resistive), 100k ops. 105°C
G2RL-1-E	SPDT (High capacity)	3 to 48 VDC	16 A at 250 VAC (General use), 100k ops. 16 A at 24 VDC (Resistive), 50k ops. 20 A at 240 VAC (General use), 85°C 15 A at 240 VAC (General use), 105°C 1/2 hp, 120 VAC, 100k ops., 70°C (NO)
G2RL-2A	DPST-NO		8 A at 277 VAC (General use), 100k ops. 8 A at 30 VDC (Resistive), 100k ops.
G2RL-2	DPDT		

## VDE (VDE0435)

Part number	Contact form	Coil ratings	Contact ratings
G2RL	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
	1 pole (High capacity)		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
	2 poles		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 “knock off vent nib” on top of relay case after the soldering/washing process.

## Electrical Life Data

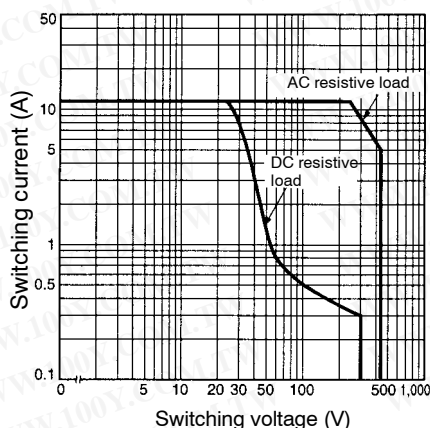
Part number	Contact rating	Minimum operations
G2RL-1-E	16 A at 250 VAC ( $\cos\phi=1$ )	100,000 operations min. (1 sec. ON / 9 sec. OFF)
	16 A at 24 VDC	30,000 operations min.
	8 A at 250 VAC ( $\cos\phi=0.4$ )	200,000 operations min. (N.O. side operation)
	8 A at 30 VDC (L/R=7 ms)	10,000 operations min.
G2RL-1	12 A at 250 VAC ( $\cos\phi=1$ )	100,000 operations min. (1 sec. ON / 9 sec. OFF)
	12 A at 24 VDC	30,000 operations min.
	5 A at 250 VAC ( $\cos\phi=0.4$ )	150,000 operations min.
	5 A at 30 VDC (L/R=7 ms)	20,000 operations min.
G2RL-2	8 A at 250 VAC ( $\cos\phi=1$ )	100,000 operations min. (1 sec. ON / 9 sec. OFF)
	8 A at 30 VDC	30,000 operations min.
G2RL-1A-E	Pilot duty (A300), 250 VAC	250,000 operations min. (1 sec. ON / 9 sec. OFF)
	Pilot duty (A300), 125 VAC	150,000 operations min. (1 sec. ON / 9 sec. OFF)
G2RL-1ATP-E	16A at 250 VAC	100,000 operations min.

- Note:**
- The results shown reflect minimum cycles using a very severe duty cycle of 1 sec ON/1 sec OFF (unless otherwise specified above).
  - 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 of the P.C.B.  
Contact Omron for applications where venting of the sealed relay is not possible.

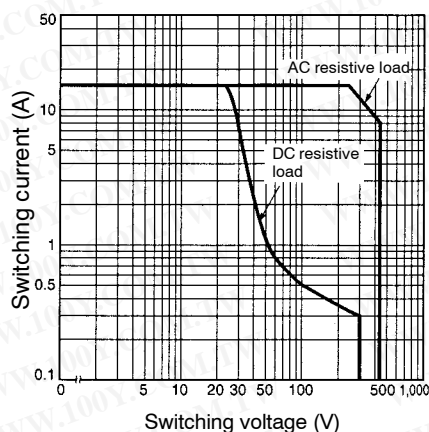
# Engineering Data

## ■ MAXIMUM SWITCHING CAPACITY

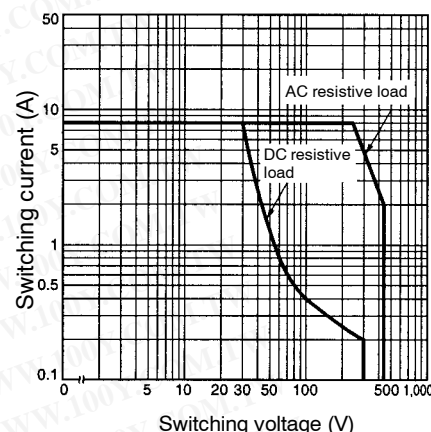
G2RL-1A, G2RL-1



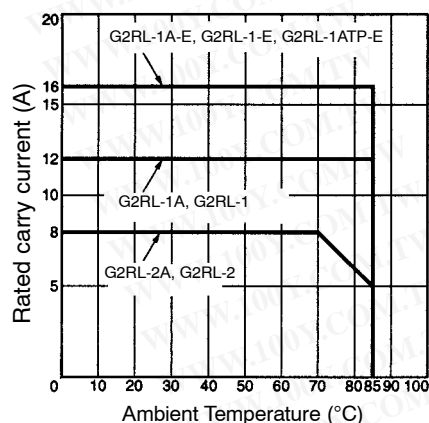
G2RL-1A-E, G2RL-1-E,  
G2RL-1ATP-E



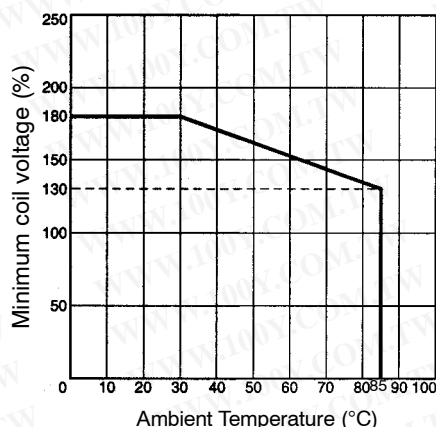
G2RL-2A, G2RL-2



## ■ 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.

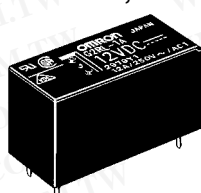
# Connections

Company	Description	Model Number
JST	TP5 Housing	RSFP-3V
	TP5 Contact	SRSF-61T-250A
	TP7 Housing	PS-250-A
	TP7 Contact	SPS-61T-250
AMP	TP5 Connector	928344-2
	TP7 Positive Locking Housing	178833
	TP7 Contact for 178833	170327, 8, 9
Molex	TP5 RAST5 Female Connector	90835-0001

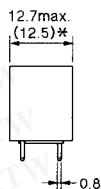
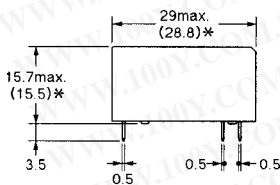
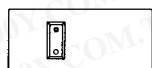
# Dimensions

Unit: mm (inch)

## G2RL-1A, G2RL-1A4



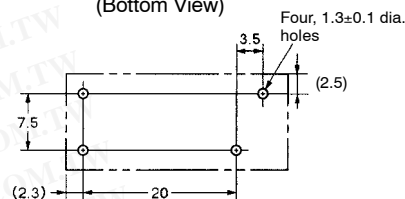
\* Indicates average dimensions.



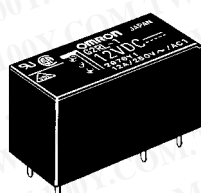
Terminal Arrangement/  
Internal Connection  
(Bottom View)



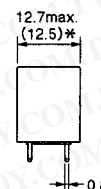
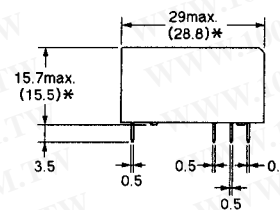
Mounting Holes  
(Bottom View)



## G2RL-1, G2RL-14



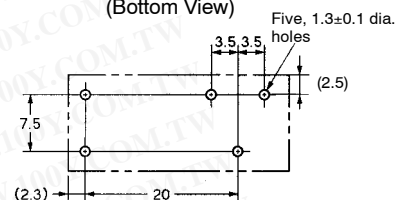
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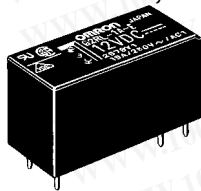
Terminal Arrangement/  
Internal Connection  
(Bottom View)



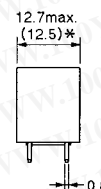
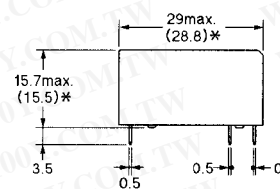
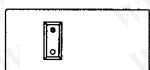
Mounting Holes  
(Bottom View)



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



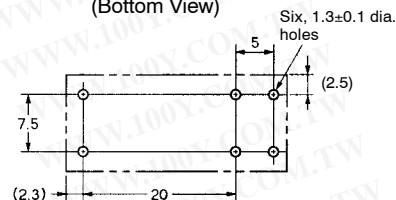
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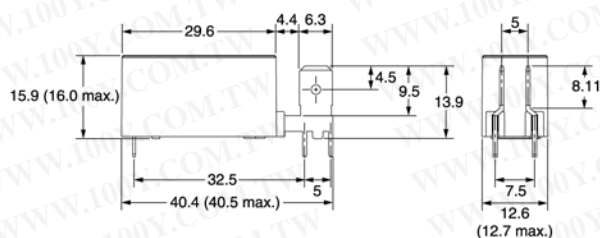
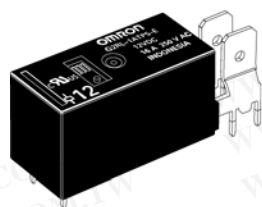
Terminal Arrangement/  
Internal Connection  
(Bottom View)



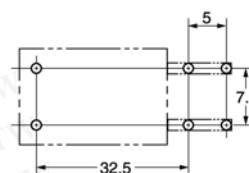
Mounting Holes  
(Bottom View)



### G2RL-1ATP5-E



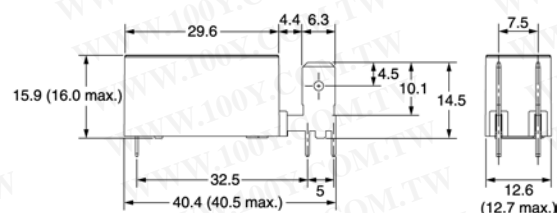
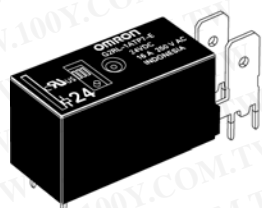
PCB Mounting Holes  
(Bottom View)



Terminal Arrangement/  
Internal Connection  
(Bottom View)

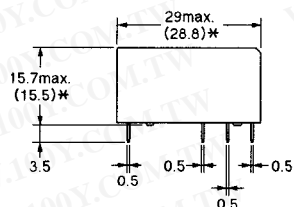
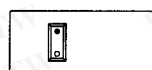
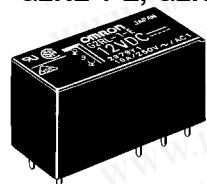


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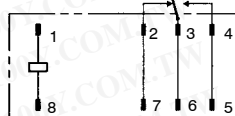


(Note: quick-connect terminals  
are bare copper alloy.)

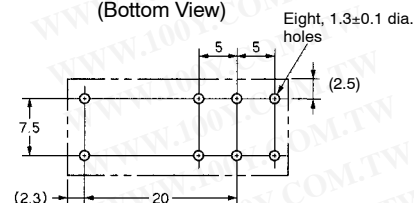
### G2RL-1-E, G2RL-14-E



Terminal Arrangement/  
Internal Connection  
(Bottom View)

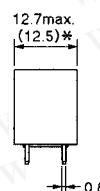
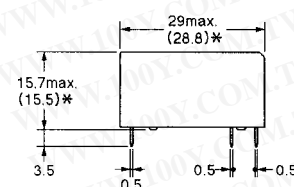
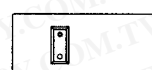
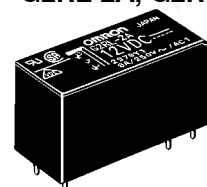


Mounting Holes  
(Bottom View)

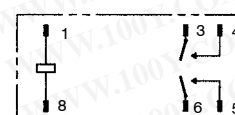


\* Indicates average  
dimensions.

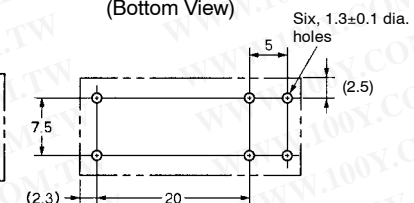
### G2RL-2A, G2RL-2A4



Terminal Arrangement/  
Internal Connection  
(Bottom View)

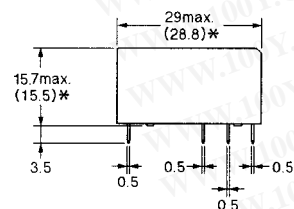
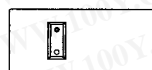
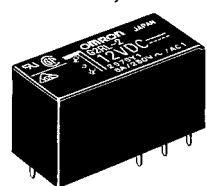


Mounting Holes  
(Bottom View)

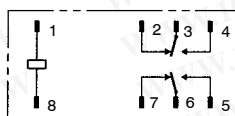


\* Indicates average  
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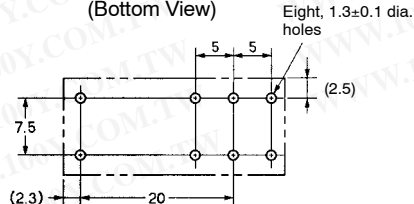
### G2RL-2, G2RL-24



Terminal Arrangement/  
Internal Connection  
(Bottom View)



Mounting Holes  
(Bottom View)



\* Indicates average  
dimensions.



## 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.

#### II. SALES

- Prices/Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment. 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.
- Discounts:** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest:** Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- 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.
- Financial:** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
- Cancellation/Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- 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.
- Shipping/Delivery:** Unless otherwise expressly agreed in writing by Seller:
  - 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 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.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
  - 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.
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  - (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.

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