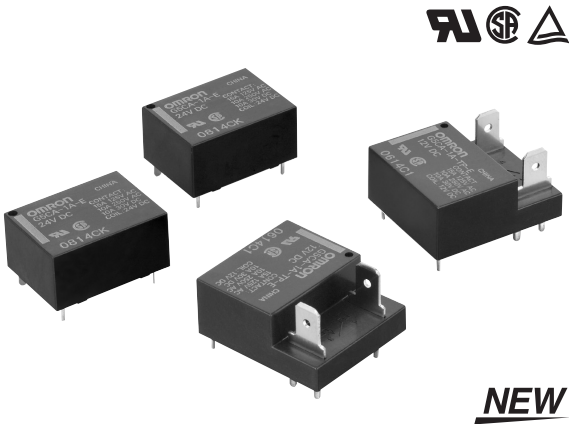


PCB Relay  
G5CA

Flat Relays that Switch 10-A/15-A Loads  
with New Quick-connect Terminals

- Ideal for switching power in household appliances or for outputs from industrial devices.
- Subminiature dimensions: 16 x 22 x 11 mm (L x W x H).
- High-sensitivity models available with low power consumption (150 mW).
- UL recognized / CSA certified.
- Fully sealed models and quick-connect terminal models available (#187 load contact terminals).
- RoHS Compliant.



Ordering Information

To order: Select the part number and add the rated coil voltage to the part number. Example: G5CA-1A4-H DC12.

| Item              |                       | Model    |                  |               |                                |
|-------------------|-----------------------|----------|------------------|---------------|--------------------------------|
| Enclosure Ratings | Contact configuration | Standard | High-sensitivity | High-capacity | Quick-connect terminals (#187) |
| Flux protection   | SPST-NO               | G5CA-1A  | G5CA-1A-H        | G5CA-1A-E     | G5CA-1A-TP-E                   |
| Fully sealed      |                       | G5CA-1A4 | G5CA-1A4-H       | ---           | ---                            |

- Note:** 1. Contact your OMRON representative for details on other coil voltage specifications.  
2. High-capacity models with a fully sealed structure are not available.  
3. Standard or high-sensitivity models with quick-connect terminals are not available.

Model Number Legend

G5CA-1A □-□-□-□  
1 2 3 4 5

1. **Number of Poles**  
1A: 1 pole (SPST-NO)

2. **Enclosure Ratings**  
None: Flux protection  
4: Fully sealed

3. **Terminal form**  
None: PCB terminal  
TP: Quick-connect terminal (#187)
4. **Special functions**  
None: Standard  
E: High-capacity

5. **Coil consumption**  
None: Standard  
H: High-sensitivity
- Standard Specifications**  
Contact Configuration: SPST-NO  
Enclosure Ratings: Flux protection  
Terminal form: PCB terminal

# Specifications

## ■ Coil Ratings

| Item                 | Standard, high-capacity, or quick-connect terminals                                      |         |         | High-sensitivity              |         |         |
|----------------------|------------------------------------------------------------------------------------------|---------|---------|-------------------------------|---------|---------|
|                      | 5 VDC                                                                                    | 12 VDC  | 24 VDC  | 5 VDC                         | 12 VDC  | 24 VDC  |
| Rated current        | 40 mA                                                                                    | 16.7 mA | 8.3 mA  | 30 mA                         | 12.5 mA | 6.25 mA |
| Coil resistance      | 125 Ω                                                                                    | 720 Ω   | 2,880 Ω | 167 Ω                         | 960 Ω   | 3,840 Ω |
| Must-operate voltage | 75% of rated voltage (max.)                                                              |         |         | 80% of rated voltage (max.)   |         |         |
| Must-release voltage | 10% of rated voltage (min.)                                                              |         |         |                               |         |         |
| Max. voltage         | 150% (standard)/130% (high-capacity, quick-connect terminals) of rated voltage (at 23°C) |         |         | 150% of rated voltage at 23°C |         |         |
| Power consumption    | Approx. 200 mW                                                                           |         |         | Approx. 150 mW                |         |         |

**Note:** 1. The rated current and coil resistance are measured at a coil temperature of 23°C (73°F) with a tolerance of  $\pm 10\%$ .

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

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

## ■ Contact Ratings

| Item                                      | Standard                           |                                                       | High-sensitivity                   |                                                       | High-capacity, or quick-connect terminals |                                                       |
|-------------------------------------------|------------------------------------|-------------------------------------------------------|------------------------------------|-------------------------------------------------------|-------------------------------------------|-------------------------------------------------------|
|                                           | Resistive load                     | Inductive load<br>( $\cos\phi = 0.4$ ,<br>L/R = 7 ms) | Resistive load                     | Inductive load<br>( $\cos\phi = 0.4$ ,<br>L/R = 7 ms) | Resistive load                            | Inductive load<br>( $\cos\phi = 0.4$ ,<br>L/R = 7 ms) |
| Contact form                              | Single                             |                                                       |                                    |                                                       |                                           |                                                       |
| Contact material                          | Silver alloy                       |                                                       |                                    |                                                       |                                           |                                                       |
| Rated load                                | 10 A at 250 VAC;<br>10 A at 30 VDC | 3 A at 250 VAC;<br>3 A at 30 VDC                      | 10 A at 250 VAC;<br>10 A at 30 VDC | 3 A at 250 VAC;<br>3 A at 30 VDC                      | 15 A at 110 VAC;<br>10 A at 30 VDC        | 5 A at 110 VAC;<br>3 A at 30 VDC                      |
| Rated carry current                       | 10 A                               |                                                       | 10 A                               |                                                       | 15 A                                      |                                                       |
| Max. switching voltage                    | 250 VAC, 125 VDC                   |                                                       |                                    |                                                       |                                           |                                                       |
| Max. switching current                    | 10 A                               |                                                       | 10 A                               |                                                       | 15 A                                      |                                                       |
| Max. switching power<br>(reference value) | 2,500 VA, 300 W                    | 750 VA, 90 W                                          | 2,500 VA, 300 W                    | 750 VA, 90 W                                          | 2,500 VA, 300 W                           | 750 VA, 90 W                                          |

## ■ Characteristics

|                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact resistance (see note 2)</b>                        | 30 mΩ max. (quick-connect terminals type: 100 mΩ max.)                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Operate time (see note 3)</b>                              | 10 ms max. (15 ms max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release time</b>                                           | 10 ms max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Insulation resistance (see note 4)</b>                     | 1,000 MΩ min. (at 500 VDC)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Dielectric strength</b>                                    | 2,500 VAC, 50/60 Hz for 1 min. between coil and contacts<br>1,000 VAC, 50/60 Hz for 1 min. between contacts of same polarity                                                                                                                                                                                                                                                                                                                                                      |
| <b>Impulse withstand voltage</b>                              | 4,500 V (1.2 x 50 μs)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Vibration resistance</b>                                   | Destruction: 10 to 55Hz, 1.5-mm double amplitude<br>Malfunction: 10 to 55 Hz, 1.5-mm double amplitude                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Shock resistance</b>                                       | Destruction: 1,000 m/s <sup>2</sup> (Approx. 100 G)<br>Malfunction: 200 m/s <sup>2</sup> (Approx. 20 G)                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Life expectancy</b>                                        | Mechanical: 20,000,000 operations min. at 18,000 operations/hr<br>Electrical:<br><ul style="list-style-type: none"> <li>• 300,000 operations min. (100,000 operations min. for Fully sealed Type) at 1,200 operations/hr under resistive load of 10 A at 250 VAC;</li> <li>• 100,000 operations min. under resistive load of 15 A at 110 VAC for high-capacity models</li> <li>• 100,000 operations min. at 1,200 operations/hr under resistive load of 10 A at 30 VDC</li> </ul> |
| <b>Minimum permissible load (reference value: see note 5)</b> | 5 VDC, 100 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Ambient temperature</b>                                    | Operating: -25°C to 70°C (with no icing or condensation)                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Ambient humidity</b>                                       | Operating: 5% to 85%                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Weight</b>                                                 | Approx. 8 g (for TP model: Approx. 9.6 g)                                                                                                                                                                                                                                                                                                                                                                                                                                         |

**Note:** 1. The data shown above are initial values.

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

3. Measurement conditions: The value in parentheses indicates the operate time for high-sensitivity types.

4. Measurement conditions: Measured at the same points as the dielectric strength using a 500-VDC ohmmeter.

5. This value is for a switching frequency of 120 operations/minute. (P level:  $\lambda_{60} = 0.1 \times 10^{-5}$  operations)

## ■ Approved Standards

- The following UL-, CSA-, and EN/TÜV-certifying ratings differ from the performance characteristics of the individual models.

### UL Recognized

(File No. E41515) - - Ambient Temp. = 40°C

| Model | No. of poles | Coil rating  | Contact rating                                                                                 | No. of operations |
|-------|--------------|--------------|------------------------------------------------------------------------------------------------|-------------------|
| G5CA  | 1            | 5 to 100 VDC | 15 A, 125 VAC (General purpose)<br>10 A, 250 VAC (General purpose)<br>10 A, 30 VDC (Resistive) | 100,000           |

### EN Standard/TÜV Certified:

EN61810-1 (Certification No. R50030053)

| Model | No. of poles | Coil rating             | Contact rating                                                                                     | No. of operations |
|-------|--------------|-------------------------|----------------------------------------------------------------------------------------------------|-------------------|
| G5CA  | 1            | 3, 5, 6, 12, 24, 48 VDC | 15 A, 125 VAC (cosφ = 1.0)<br>15 A, 250 VAC (cosφ = 1.0)<br>10 A, 30 VDC ( $\frac{t}{t_A} = 0$ ms) | 100,000           |

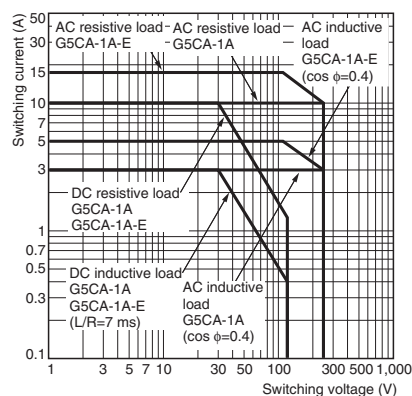
### CSA Certified

(File No. LR31928)

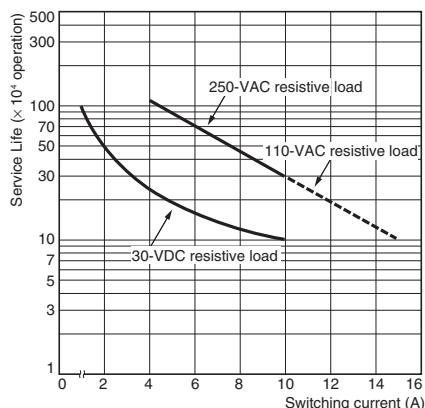
| Model | No. of poles | Coil rating  | Contact rating                                                                                 | No. of operations |
|-------|--------------|--------------|------------------------------------------------------------------------------------------------|-------------------|
| G5CA  | 1            | 5 to 100 VDC | 15 A, 125 VAC (General purpose)<br>10 A, 250 VAC (General purpose)<br>10 A, 30 VDC (Resistive) | 100,000           |

# Engineering Data

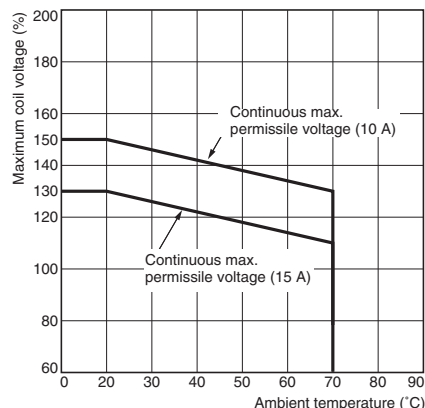
## Maximum Switching Capacity



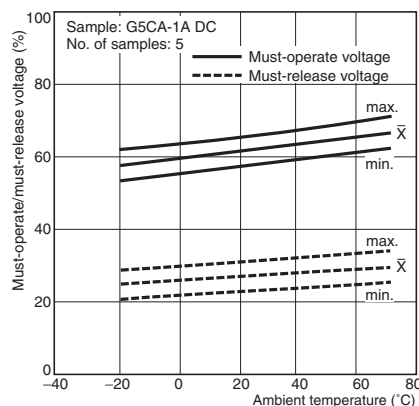
## Electrical Service Life



## Ambient Temperature vs. Maximum Coil Voltage

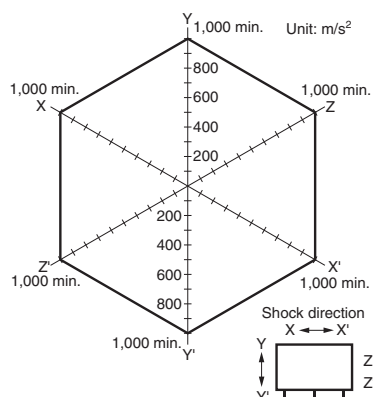


## Operating Temperature vs. Must-operate/Must-release Voltage



**Note:** The "maximum voltage" is the maximum voltage that can be applied to the relay coil, but, not continuously.

## Malfunction Shock

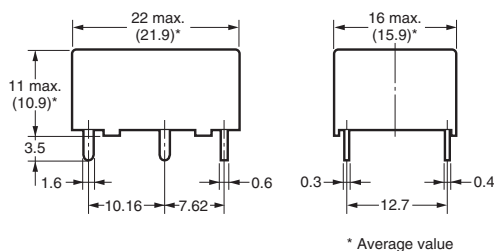
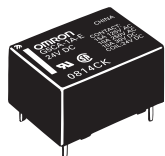


No. of samples: 10  
Measured value: The value at which malfunction occurs in the contact when the contact is subjected to shock three times each in six directions for three axes.  
Standard: 200  $\text{m/s}^2$

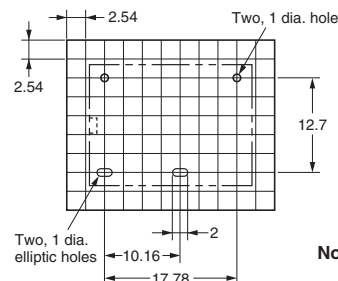
# Dimensions

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

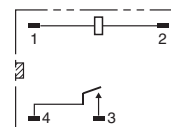
## G5CA-1A(-E) G5CA-1A4(-H)



## Mounting Holes (PCB) (BOTTOM VIEW) Tolerance: $\pm 0.1$ mm



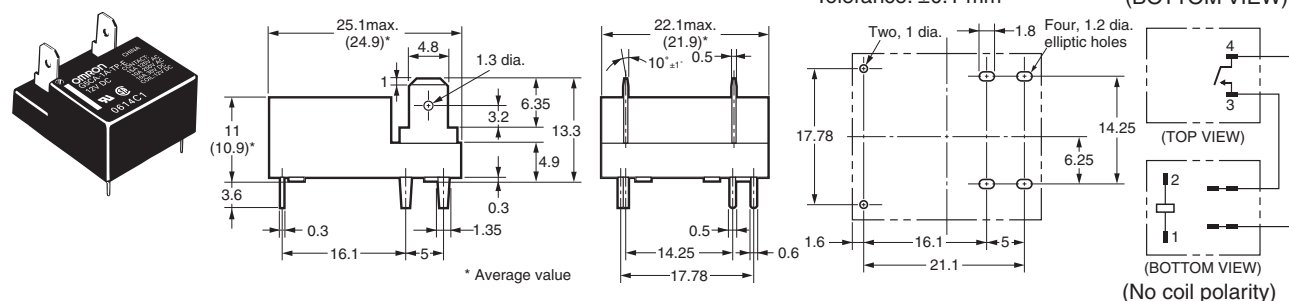
## Terminal Arrangement/ Internal Connections (BOTTOM VIEW)



(No coil polarity)

**Note:** Orientation marks are indicated as follows:

# G5CA-1A-TP-E

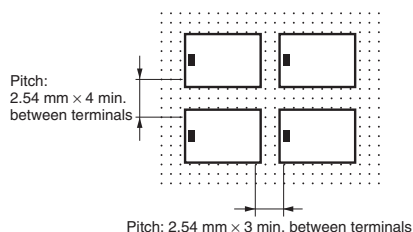


## Precautions

### ■ Precautions for Correct Use

#### Installation

Make sure that sufficient space is provided between relays when installing two or more relays side by side to facilitate heat dissipation. Insufficient heat dissipation may result in the relay malfunctioning.



#### Quick-connect Terminal Connections

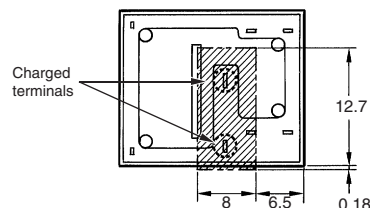
- Do not pass current through the PCB of the load contact terminals (quick-connect terminals).
- The terminals are compatible with Faston receptacle #187 and are suitable for positive-lock mounting. Use only Faston terminals with the specified numbers. Select leads for connecting Faston receptacles with wire diameters that are within the allowable range for the load current. Do not apply excessive force to the terminals when mounting or dismounting the Faston receptacle. Insert and remove terminals carefully one at a time. Do not insert terminals on an angle, or insert/remove multiple terminals at the same time. The following positive-lock connectors made by AMP are recommended. Contact the manufacturer directly for details on connectors including availability.

| Type                            | Receptacle terminals (see note) | Positive housing             |
|---------------------------------|---------------------------------|------------------------------|
| #187 terminals (width: 4.75 mm) | AMP 170330-1 (170324-1)         | AMP 172074-1 (natural color) |
|                                 | AMP 170331-1 (170325-1)         | AMP 172074-4 (yellow)        |
|                                 | AMP 170332-1 (170326-1)         | AMP 172074-5 (green)         |
|                                 |                                 | AMP 172074-6 (blue)          |

**Note:** The numbers shown in parentheses are for air-feeding.

#### Charged Terminals

The section marked with dotted circles (indicated by arrows) in the following diagram includes the charged terminals of the relay. When the relay is mounted on a PCB, make sure that there are no metal patterns on the section of the PCB facing the portion of the relay shaded in the following diagram.



#### Other Precautions

- The G5CA is a power relay designed for applications switching power loads such as heaters in electric household appliances. Do not use the G5CA to switch micro loads less than 100 mA, such as in signal applications.
- Use fully sealed models if the relays will require washing. Flux-protection models may malfunction or the relay's performance may be otherwise adversely affected if cleaning fluid enters the relay.

# MEMO

# 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 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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- 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 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.
- 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.
  - Motorized Vehicle Application:** USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.
  - Programmable Products:** Seller shall not be responsible for the Buyer's programming of a programmable Product.

### 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.
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- Indemnities:** Buyer shall indemnify and hold harmless Seller, its affiliates and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Seller is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products.

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- Intellectual Property:** The intellectual property embodied in the Products is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Buyer (at its own expense) shall indemnify and hold harmless Seller and defend or settle any action brought against Seller to the extent that it is based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
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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.
- Export Controls:** Buyer shall comply with all applicable laws, regulations and licenses regarding (a) export of the Products or information provided by Seller; (b) sale of Products to forbidden or other proscribed persons or organizations; (c) disclosure to non-citizens of regulated technology or information.

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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.
2. **Programmable Products.** Seller shall not be responsible for the user's programming of a programmable product, or any consequence thereof.
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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.

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