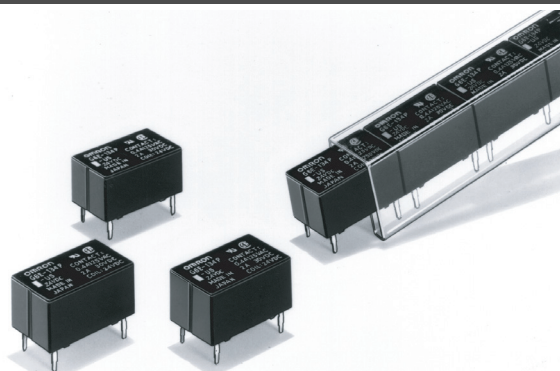


# Low Signal Relay G6E

## Subminiature, Sensitive Signal Relay

- Subminiature 7.87 H x 9.91 W x 16 L mm.
- High sensitivity with pick-up coil power of 98 mW.
- Surge withstand voltage meets FCC Part 68 requirements.
- Unique moving loop armature reduces relay size, magnetic interference, and contact bounce time.
- Bifurcated crossbar contact assures high reliability.
- Single and Dual coil latching versions available.
- Fully sealed construction.
- RoHS Compliant.



## Ordering Information

To Order: Select the part number and add the desired coil voltage rating, (e.g., G6E-134P-ST-US-DC6).

Contact form		Model			
		Terminal style	Standard	Single coil latching	Dual coil latching
SPDT	Bifurcated crossbar	Straight	G6E-134P-US	G6EU-134P-US	G6EK-134P-US
		Self-clinching	G6E-134C-US	G6EU-134C-US	G6EK-134C-US

### Model Number Legend

G6E  -      -  -  DC   
 1      2      3      4      5      6      7      8      9

- |                                                                                                                                                                                                                                          |                                                                                                                                                                                              |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1. Relay Function</b><br/>                 None: Single-side stable<br/>                 U: Single-winding latching<br/>                 K: Double-winding latching</p> <p><b>2. Contact Form</b><br/>                 1: SPDT</p> | <p><b>3. Contact Type</b><br/>                 3: Bifurcated crossbar<br/>                 Ag (Au-Alloy) contact</p> <p><b>4. Enclosure Ratings</b><br/>                 4: Fully sealed</p> | <p><b>5. Terminals</b><br/>                 P: Straight PCB<br/>                 C: Curved tail</p> <p><b>6. Special Function</b><br/>                 L: Low sensitivity coil (400 mW)</p> | <p><b>7. Standoff dimension</b><br/>                 Blank: 0.3 mm<br/>                 ST: 0.64 mm</p> <p><b>8. Approved Standards</b><br/>                 US: UL, CSA certified</p> <p><b>9. Rated Coil Voltage</b><br/>                 3, 5, 6, 9, 12, 24, 48 VDC</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Specifications

### Contact Data

Load	Resistive load (p.f. = 1)	Inductive load (p.f. = 0.4) (L/R = 7 ms)
Rated load	0.40 A at 125 VAC, 2 A at 30 VDC	0.20 A at 125 VAC, 1 A at 30 VDC
Contact material	Ag (Au clad)	
Carry current	3 A	
Max. operating voltage	250 VAC, 220 VDC	
Max. operating current	3 A	
Max. switching capacity	50 VA, 60 W	25 VA, 30 W
Min. permissible load (See note)	10 ?A, 10 mVDC	

**Note:** P level:  $\lambda_{60} = 0.1 \times 10^{-6}$ /operation  
 This value was measured at a switching frequency of 120 operations/min and the criterion of contact resistance is 50  $\Omega$ . This value may vary depending on the switching frequency and operating environment. Always double-check relay suitability under actual operating conditions.

## ■ Coil Data

### Standard Non-latching Type (G6E-134P(-ST)-US, G6E-134C(-ST)-US)

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Coil inductance (ref. value) (H)		Pick-up voltage	Dropout voltage	Maximum voltage	Power consumption (mW)
			Armature OFF	Armature ON				
3	66.70	45	0.08	0.06	70% max.	10% min.	190% at 23°C	Approx. 200
5	40	125	0.18	0.17				
6	33.30	180	0.31	0.24				
9	22.20	405	0.62	0.50				
12	16.70	720	1.20	0.99				
24	8.30	2,880	4.70	3.90				
48	8.30	5,760	5.35	5.12	170% at 23°C	Approx. 400		

### Low-sensitivity Non-latching Type (G6E-134PL(-ST)-US)

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Coil inductance (ref. value) (H)		Pick-up voltage	Dropout voltage	Maximum voltage	Power consumption (mW)
			Armature OFF	Armature ON				
3	133	22.50	0.03	0.03	70% max.	10% min.	190% at 23°C	Approx. 400
5	79.40	63	0.08	0.07				
6	66.60	90	0.12	0.10				
9	44.30	203	0.21	0.19				
12	33.30	360	0.45	0.42				
24	16.70	1,440	1.77	1.65				

### Standard Single Coil Latching Type (G6EU-134P(-ST)-US, G6EU-134C(-ST)-US)

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Coil inductance (ref. value) (H)		Set pick-up voltage	Reset pick-up voltage	Maximum voltage	Power consumption (mW)
			Armature OFF	Armature ON				
3	66.70	45	0.05	0.04	70% max.	70% min.	190% max. at 23°C	Approx. 200
5	40	125	0.13	0.12				
6	33.30	180	0.19	0.17				
9	22.20	405	0.45	0.40				
12	16.70	720	0.84	0.79				
24	8.30	2,880	3.56	3.10				

### Standard Dual Coil Latching Type (G6EK-134P(-ST)-US, G6EK-134C(-ST)-US)

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Coil inductance (ref. value) (H)		Set pick-up voltage	Reset pick-up voltage	Maximum voltage	Power consumption (mW)
			Armature OFF	Armature ON				
3	66.70	45	0.05	0.04	70% max.	70% min.	190% max. at 23°C	Approx. 200
5	40	125	0.09	0.08				
6	33.30	180	0.12	0.11				
7	22.20	405	0.25	0.22				
12	16.70	720	0.44	0.41				
24	8.30	2,880	1.66	1.62				

- Note:**
1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
  2. Operating characteristics are measured at a coil temperature of 23°C.
  3. The maximum voltage is the highest voltage that can be imposed on the relay coil.

Low-sensitivity Dual Coil Latching Type (G6EK-134PL(-ST)-US)

Rated voltage (VDC)	Rated current (mA)	Coil resistance ( $\Omega$ )	Coil inductance (ref. value) (H)		Set pick-up voltage	Reset pick-up voltage	Maximum voltage	Power consumption (mW)
			Armature OFF	Armature ON				
3	133	22.50	0.02	0.01	70% max.	70% min.	170% max. at 23°C	Approx. 400
5	79.40	63	0.04	0.03				
6	66.60	90	0.06	0.04				
9	44.30	203	0.12	0.09				
12	33.30	360	0.21	0.15				
24	16.70	1,440	0.80	0.58				

- Note:**
- The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of  $\pm 10\%$ .
  - Operating characteristics are measured at a coil temperature of 23°C.
  - The maximum voltage is the highest voltage that can be imposed on the relay coil.

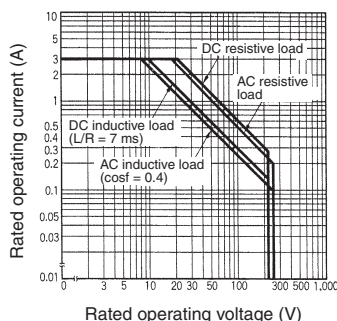
## Characteristics

<b>Contact resistance (See note 1)</b>		50 m $\Omega$ max.
<b>Operate time (set) time (See note 2)</b>		5 ms max. (mean value approx. 2.90 ms, 48 VDC type, approx. 2.40 ms)
<b>Release time (reset) time (See note 2)</b>		5 ms max. (mean value approx. 1.30 ms)
<b>Min. set/reset signal width</b>		Latching type: 15 ms min. (at 23°C)
<b>Operating frequency (max.)</b>	<b>Mechanical</b>	36,000 operations/hour
	<b>Electrical</b>	1,800 operations/hour (under rated load)
<b>Insulation resistance (See note 3)</b>		1,000 M $\Omega$ min. (at 500 VDC)
<b>Dielectric strength</b>		1,500 VAC, 50/60 Hz for 1 minute between coil contacts 1,000 VAC, 50/60 Hz for 1 minute between contacts of same pole
<b>Surge withstand voltage</b>		1,500 V (10 x 160 $\mu$ s) (conforms to FCC Part 68) 2,500 V (2 x 10 $\mu$ s) (Telcordia Requirement)
<b>Vibration</b>	<b>Mechanical durability</b>	10 to 55 Hz; 5 mm double amplitude
	<b>Malfunction durability</b>	10 to 55 Hz; 3.3 mm double amplitude
<b>Shock</b>	<b>Mechanical durability</b>	1,000 m/s <sup>2</sup> , approx. 100G
	<b>Malfunction durability</b>	300 m/s <sup>2</sup> , approx. 30G
<b>Ambient temperature</b>		-40°C to 70°C with no icing
<b>Humidity</b>		5% to 85% RH
<b>Service life</b>	<b>Mechanical</b>	100 million operations min. (at 36,000 operations/hour)
	<b>Electrical</b>	100,000 operations min (0.4A at 125 VAC resistive; 0.2A at 125VAC inductive) 500,000 operations min. (2A at 30 VDC resistive; 1A at 30VDC inductive) 200,000 operations min. (3A at 30 VDC resistive) See "Characteristic Data"
<b>Weight</b>		Approx. 2.7 g

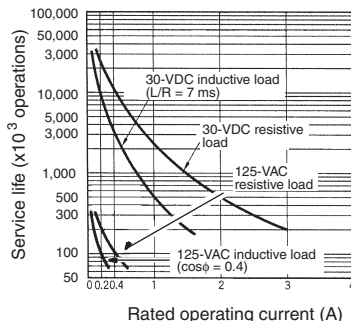
- Note:**
- The contact resistance was measured with 1A at 5VDC with a fall-of-potential method.
  - Values in parentheses are typical values unless otherwise stated.
  - The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those for checking the dielectric strength
  - The above values are initial values.

## Characteristic Data

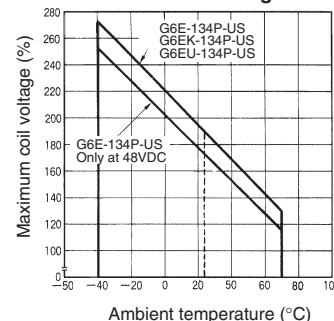
Maximum Switching Capacity



Electrical Service Life





Ambient Temperature vs. Maximum Coil Voltage



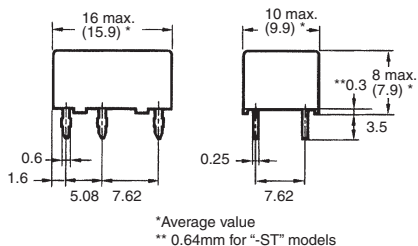
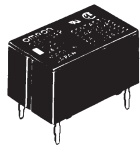
**Note:** The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

# Dimensions

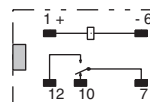
Note: 1. All units are in millimeters unless otherwise indicated.  
 2. Orientation marks are indicated as follows:  

## Standard coil

G6E-134P(L)-(ST)-US



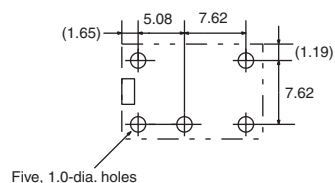
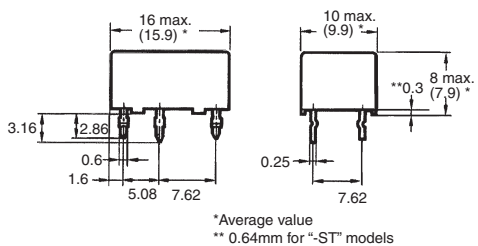
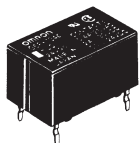
Terminal Arrangement/  
Internal Connections  
(Bottom View)



Mounting Holes  
(Bottom View)

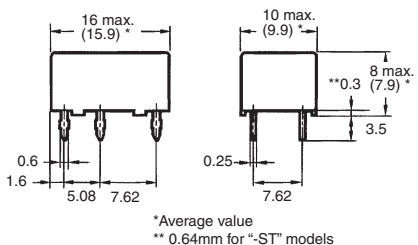
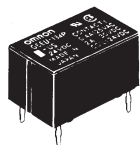
Tolerance: ±0.1

G6E-134C-(ST)-US

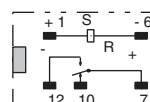


## Single coil latching

G6EU-134P(L)-(ST)-US



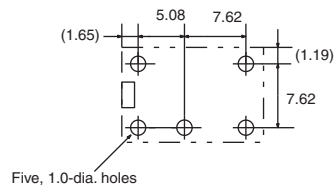
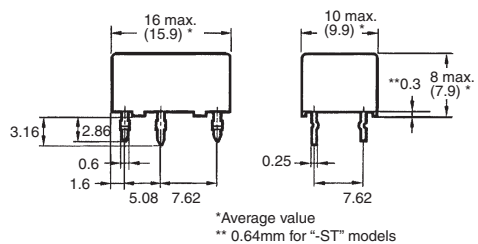
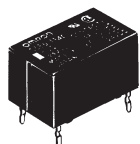
Terminal Arrangement/  
Internal Connections  
(Bottom View)



Mounting Holes  
(Bottom View)

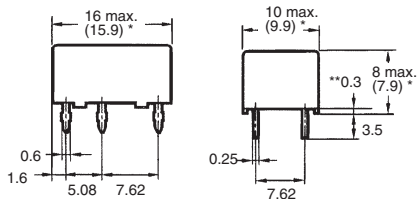
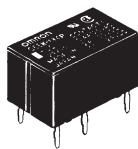
Tolerance: ±0.1

G6EU-134C-(ST)-US



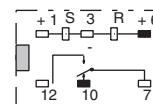
### Dual coil latching

G6EK-134P(L)(-ST)-US



\*Average value  
\*\* 0.64mm for "-ST" models

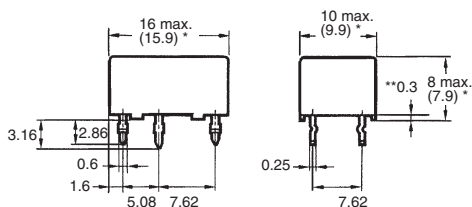
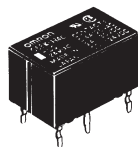
#### Terminal Arrangement/ Internal Connections (Bottom View)



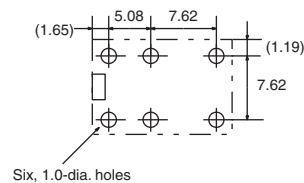
#### Mounting Holes (Bottom View)

Tolerance: ±0.1

G6EK-134C(-ST)-US



\*Average value  
\*\* 0.64mm for "-ST" models



## ■ Approvals

UL Recognized (File No. E41515) / CSA Certified (File No. LR31928) - - Ambient Temp. = 40°C

Contact form	Coil ratings	Contact ratings	Number of test operations
SPDT	3 to 48 VDC	0.2 A at 250 VAC (General Use) 0.6 A at 125 VAC (General Use) 2 A at 30 VDC (Resistive) 0.6 A at 125 VDC (Resistive, Ag contact only)	6,000

- Note:**
1. The rated values approved by each of the safety standards (e.g., UL, CSA, TUV) may be different from the performance characteristics individually defined in this catalog.
  2. In the interest of product improvement, specifications are subject to change.

# Precautions

## ■ Precautions for Correct Use

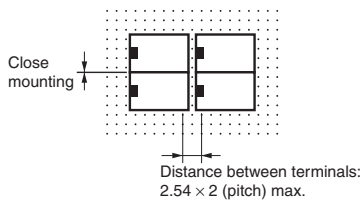
### Long-term Continuously ON Contacts

Using the Relay in a circuit where the Relay will be ON continuously for long periods (without switching) can lead to unstable contacts because the heat generated by the coil itself will affect the insulation, causing a film to develop on the contact surfaces. We recommend using a latching relay (magnetic-holding relay) in this kind of circuit. If a single-side stable model must be used in this kind of circuit, we recommend using a fail-safe circuit design that provides protection against contact failure or coil burnout.

### Installation

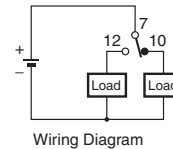
Do not reverse the polarity of the coil (+, -).

Provide sufficient space between Relays when mounting two or more on the same PCB, as shown in the following diagram.



### Wiring

Refer to the following diagram when wiring to switch a DC load. The difference in polarity applied to the contacts will affect the endurance of the Relay due to the amount of contact movement. To extend the endurance characteristics beyond the performance ratings, wire the common (pin 7) terminal to the positive (+) side.



### Ultrasonic Cleaning

Do not use ultrasonic cleaning on standard relay models. Doing so may result in resonance, coil burnout, and contact adhesion within the Relay.

### Relay Handling

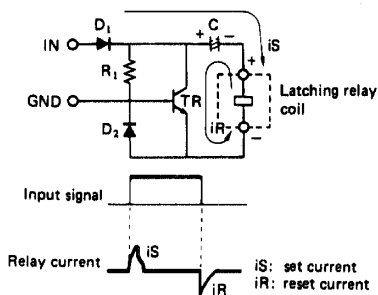
When washing the product after soldering the Relay to a PCB, use a water-based solvent or alcohol-based solvent, and keep the solvent temperature to less than 40°C. Do not put the Relay in a cold cleaning bath immediately after soldering.

## ■ Hints on Correct Use

Single-winding type (G6EU)

Example of low-power consumption driver circuit

1. This is an example of a driver circuit that allows Model G6E to function as a normal relay with a normal switching pulse input.
2. The relay is set by an abrupt current charged to capacity C. This current flows in the relay via diode D<sub>1</sub> and C and out via diode D<sub>2</sub>.
3. The relay is reset by the discharge current of C flowing in the relay via transistor TR and C.



- Note:**
1. Give adequate consideration to the circuit constant when actually using this circuit, confirming the set and reset status of the relay.
  2. OMRON owns the patent on this circuit. Consult OMRON when using this circuit.

# 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.
- 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 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.
- 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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