

# Surface-mounting Relay G6J-Y

## Ultra-compact and Slim DPDT Relay

- Dimensions of 9H x 5.7W x 10.6L mm provide a mounting area reduction of approx. 56% when compared with the OMRON G6S.
- Dielectric strength of 1,500 VAC and an impulse withstand voltage of 2,500 V for 2 x 10 μs (conforms to Telcordia specifications (formerly Bellcore)).
- Conforms to FCC Part 68 requirements (1,500 V, 10 x 160 μs).
- Single-winding latching models to save energy.
- UL recognized / CSA certified.
- RoHS Compliant.



## Ordering Information

Item		Model	
Terminal	Contact form	Non-latching	Single coil latching
PCB through-hole	DPDT	G6J-2P-Y	G6JU-2P-Y
SMT Gull-wing		G6J-2FL-Y	G6JU-2FL-Y
SMT Shortened leads		G6J-2FS-Y	G6JU-2FS-Y

**Note 1:** When ordering, add the rated coil voltage to the model number.  
Example: G6J-2P-Y DC12  
  └─── Rated coil voltage

**Note 2:** When ordering tape packing, add “-TR” to the model number.  
Example: G6J-2P-Y-TR DC12  
  └─── Rated coil voltage

“-TR” is not part of the relay model number. Therefore it is not marked on the relay case.

### Model Number Legend:

G6J    -       - Y -    DC     
      1   2   3      4      5

**1. Relay Function**

None: Non-latching, standard  
U: Single-winding latching

**2. Contact Form**

2: DPDT

**3. Terminal Shape**

P: PCB through-hole terminals  
FL: SMT Gull-wing  
FS: SMT shortened leads

**4. Packaging**

None: Tube packaging  
TR: Tape and reel packaging

**9. Rated Coil Voltage**

3, 4.5, 5, 12, 24

## Application Examples

Communications equipment, measurement devices, computer peripheral devices, office automation equipment, and audio-visual products.

# Specifications

## ■ Contact Data

Rated load	0.3 A @ 125 VAC 1 A @ 30 VDC
Contact material	Ag (Au Clad)
Max. carry current	1 A
Max. operating voltage	125 VAC, 110 VDC
Max. operating current	1 A
Max. switching capacity	37.5 VA, 30 W
Min. permissible load (see note)	10m VDC, 10 $\mu$ A

**Note:** This value was measured at a switching frequency of 120 operations/min and the criterion of contact resistance is 5% of the load impedance. This value may vary depending on the operating frequency, operating conditions, expected reliability level of the relay, etc. Always double-check relay suitability under actual load conditions.

## ■ Coil Data

### G6J-Y Standard, Non-latching (G6J-2P-Y, G6J-2FS-Y, G6J-2FL-Y)

Rated voltage (VDC)	Rated current (mA)	Coil resistance ( $\Omega$ )	Pick-up voltage	Drop-out voltage	Max. voltage	Power consumption (mW)
			% of rated voltage			
3	48.0	62.5	75% max.	10% min.	150% max.	140
4.5	32.6	137.9				
5	28.9	173.1				
12	12.3	976.8				
24	9.2	2,600.5				230

- Note:**
1. The rated current and coil resistance are measured at a coil temperature of 23°C 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 highest voltage that can be imposed on the Relay coil instantaneously.

### G6JU-Y Single coil, Latching (G6JU-2P-Y, G6JU-2FL-Y, G6JU-2FS-Y)

Rated voltage (VDC)	Rated current (mA)	Coil resistance ( $\Omega$ )	Set voltage	Reset voltage	Max. voltage	Power consumption (mW)
			% of rated voltage			
3	33.7	89.0	75% max.	75% max.	150% max.	100
4.5	22.0	204.3				
5	20.4	245.5				
12	9.0	1,329.2				

- Note:**
1. The rated current and coil resistance are measured at a coil temperature of 23°C 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 highest voltage that can be imposed on the Relay coil instantaneously.

## ■ Characteristics

Item	Standard non-latching relays G6J-2P-Y, G6J-2FS-Y, G6J-2FL-Y		Single coil latching relays G6JU-2P-Y, G6JU-2FS-Y, G6JU-2FL-Y	
	<b>Contact resistance (See note 1)</b>	100 mΩ max.		
<b>Operating (set) time (See note 2)</b>	3 ms max. (approx. 1.6 ms)			
<b>Release (reset) time (See note 2)</b>	3 ms max. (approx. 1.0 ms)		3 ms max. (approx. 0.9 ms)	
<b>Minimum set/reset pulse width</b>	---		10 ms min. (at 100% rated coil voltage)	
<b>Insulation resistance (See note 3)</b>	1,000 MΩ min. (at 500 VDC)			
<b>Dielectric strength</b>	1,500 VAC, 50/60 Hz for 1 min. between coil and contacts 1,000 VAC, 50/60 Hz for 1 min. between contacts of different polarity 750 VAC, 50/60 Hz for 1 min. between contacts of the same polarity			
<b>Surge withstand voltage</b>	2,500 VAC, (2 x 10 μs) between coil and contacts 1,500 VAC, (10 x 160 μs) between contacts of the same and different polarity			
<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>	750 m/s <sup>2</sup> (approx. 75G)		
<b>Service life</b>	<b>Mechanical</b>	50,000,000 operations min. (at 36,000 operations/hour)		
	<b>Electrical</b>	100,000 operations min. (with a rated load at 1,800 operations/hour)		
<b>Ambient temperature</b>	-40 to 85°C with no icing or condensation			
<b>Humidity</b>	5% to 85% RH			
<b>Weight</b>	Approx. 1.0 g			

- Note:**
1. The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.
  2. Values in parentheses are typical values unless otherwise stated.
  3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those for checking the dielectric strength.
  4. The above values are initial values.

# Characteristic Data

## Maximum Switching Capacity



## Ambient Temperature vs. Maximum Voltage



Note: "Maximum voltage" is the maximum voltage that can be applied to the Relay coil.

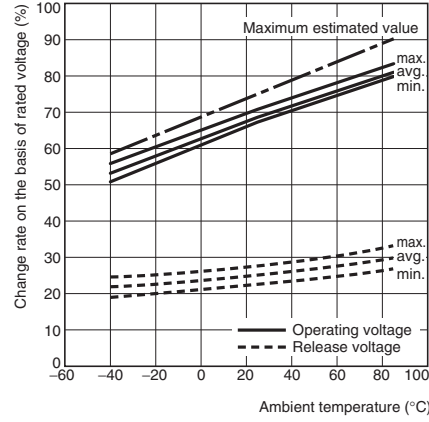
## Ambient Temperature vs. Switching Current



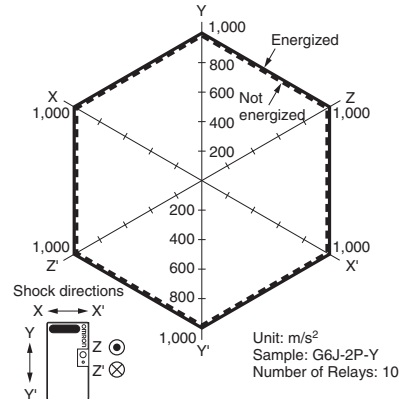
## Electrical Life Expectancy



## Ambient Temperature vs. Must Operate or Must Release Voltage

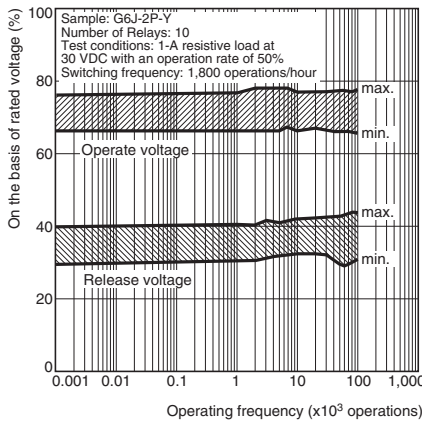


## Shock Malfunction

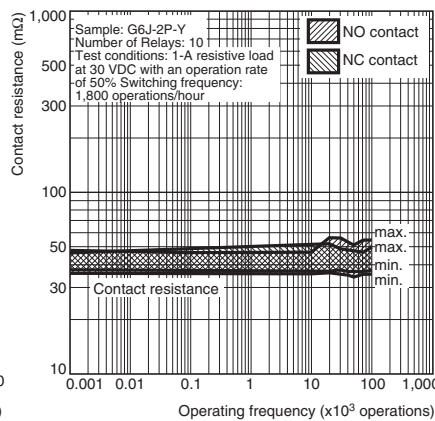


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

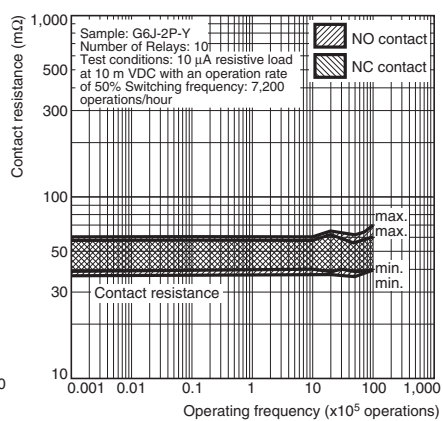
## Electrical Life Expectancy (with Must Operate and Must Release Voltage) (See note.)



## Electrical Life Expectancy (Contact resistance) (See note.)



## Contact Reliability Test (See note.)



Note: 1. The tests were conducted at an ambient temperature of 23°C.  
2. The contact resistance data are periodically measured reference values and are not values from each monitoring operation. Contact resistance values will vary according to the switching frequency and operating environment, so be sure to check operation under the actual operating conditions before use

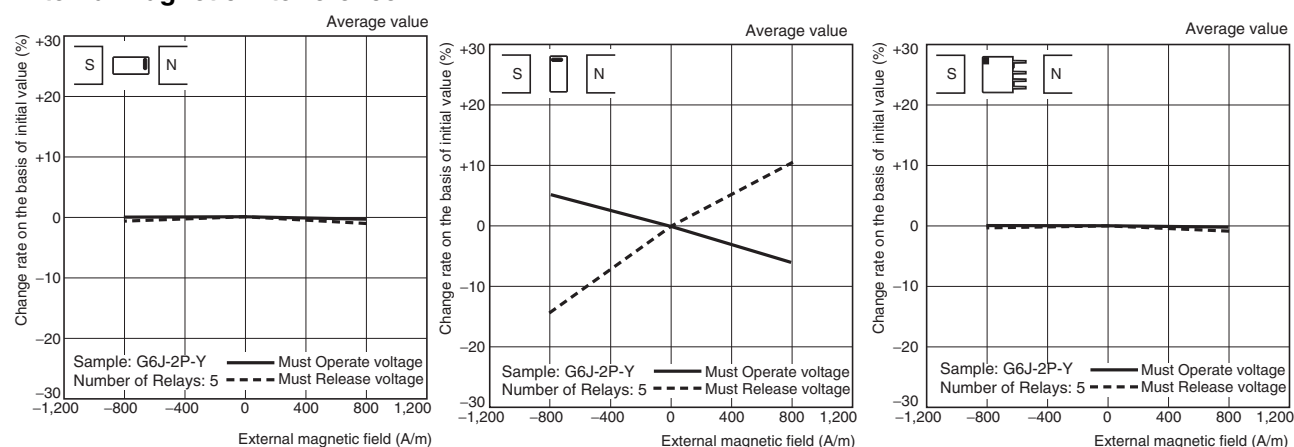
### Mutual Magnetic Interference



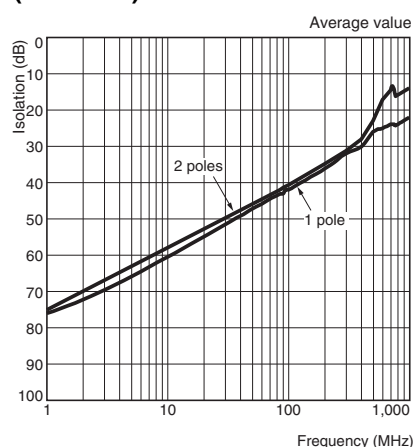
### Mutual Magnetic Interference



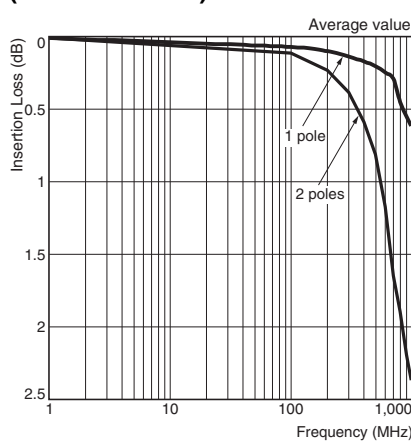
### External Magnetic Interference



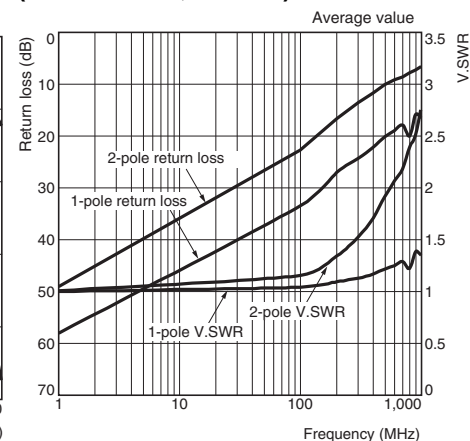
### High-frequency Characteristics (Isolation)



### High-frequency Characteristics (Insertion Loss)



### High-frequency Characteristics (Return Loss, V.SWR)



- Note:**
- The tests were conducted at an ambient temperature of 23°C.
  - High-frequency characteristics depend on the PCB to which the Relay is mounted. Always check these characteristics, including endurance, in the actual machine before use.

**Must Operate and Must Release Time Distribution (See note.)**



**Must Operate and Must Release Bounce Time Distribution (See note.)**



**Vibration Resistance**



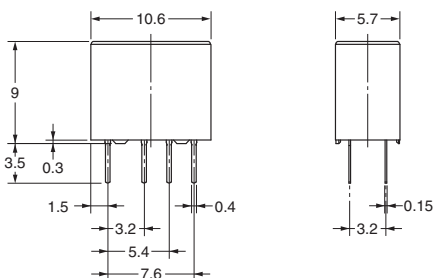
**Note:** The tests were conducted at an ambient temperature of 23°C.

# Dimensions

Note: All units are in millimeters unless otherwise stated.

A tolerance of  $\pm 0.3$  ( $\pm 0.01$ ) applies to every dimension in the following drawings unless otherwise stated.

## G6J-2P-Y G6JU-2P-Y



### Mounting Dimensions (Bottom View)\*



\*Tolerance  $\pm 0.1$  mm

### Terminal Arrangement Internal Connections (Bottom View)



## G6J-2FS-Y G6JU-2FS-Y

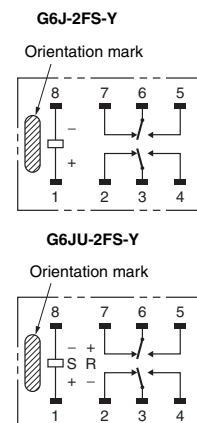


### Mounting Dimensions (Top View)\*

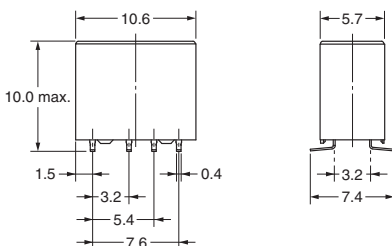
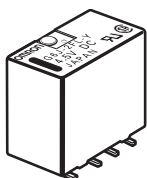


\*Tolerance  $\pm 0.1$  mm

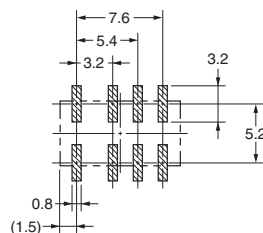
### Terminal Arrangement/ Internal Connections (Top View)



## G6J-2FL-Y G6JU-2FL-Y

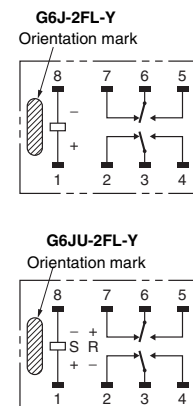


### Mounting Dimensions (Top View)\*



\*Tolerance  $\pm 0.1$  mm

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

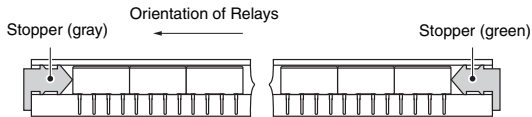


# Stick Packing and Tape Packing

## 1. Stick Packing

Relays in stick packing are arranged so that the orientation mark of each Relay is on the left side.

Always confirm that the Relays are in the correct orientation when mounting the Relays to the PCBs.



Stick length: 555 mm (stopper not included)

No. of Relays per stick: 50

## 2. Tape Packing (Surface-mounting Terminal Relays)

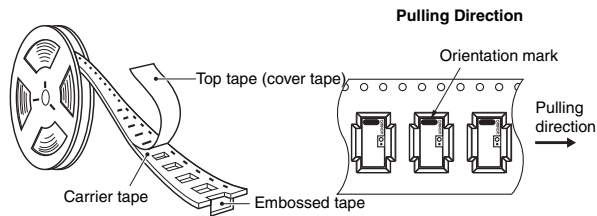
When ordering Relays in tape packing, add the prefix “-TR” to the model number, otherwise the Relays in stick packing will be provided.

Tape type: TB2412R (EIAJ (Electronic Industrial Association of Japan))

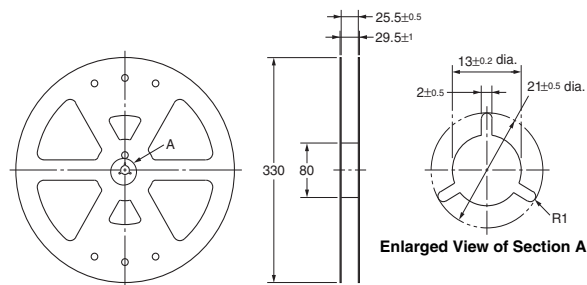
Reel type: R24D (EIAJ (Electronic Industrial Association of Japan))

Relays per reel: 400

### Direction of Relay Insertion

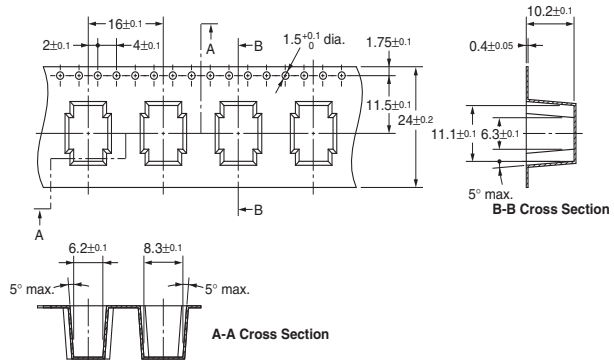


### Reel Dimensions

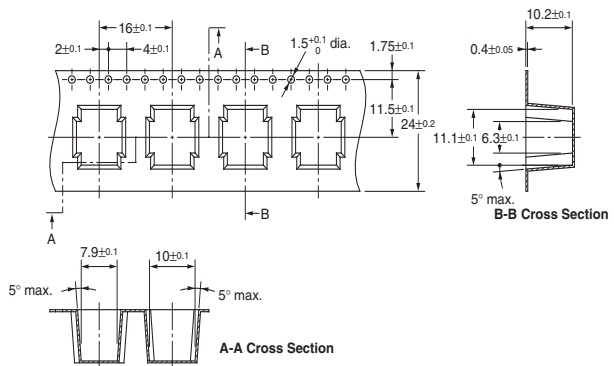


### Carrier Tape Dimensions

#### G6J-2FS-Y, G6JU-2FS-Y



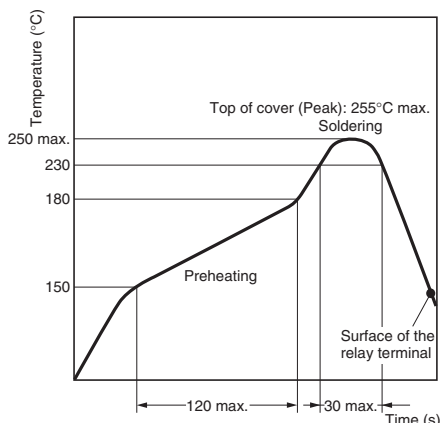
#### G6J-2FL-Y, G6JU-2FL-Y



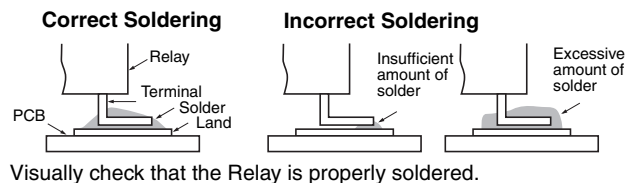


# Recommended Soldering Method

## IRS Method (for Surface-mounting Terminal Relays)



- The thickness of cream solder to be applied should be between 150 and 200 μm on OMRON's recommended PCB pattern.
- In order to perform correct soldering, it is recommended that the correct soldering conditions be maintained as shown below on the left-hand side.



Visually check that the Relay is properly soldered.

**Note:** Temperatures are given for the surface of the terminal.

## ■ Approved Standards

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

Contact form	Coil rating	Contact rating	Number of test operations
DPDT	G6J-2P-Y, 2FS-Y, 2FL-Y: 3 to 24 VDC G6JU-2P-Y, 2FS-Y, 2FL-Y: 3 to 24 VDC	1 A at 30 VDC (Resistive) 0.5 A at 60 VDC (Resistive) 0.3 A at 125 VAC (General purpose)	6000

# Precautions

## Correct Use

### Long Term Current Carrying

Under a long-term current carrying without switching, the insulation resistance of the coil goes down gradually due to the heat generated by the coil itself. Furthermore, the contact resistance of the Relay will gradually become unstable due to the generation of film on the contact surfaces. A Latching Relay can be used to prevent these problems. When using a non-latching relay, the design of the fail-safe circuit provides protection against contact failure and open coils.

### Handling of Surface-mounting Relays

Use the Relay as soon as possible after opening the moisture-proof package. If the Relay is left for a long time after opening the moisture-proof package, the appearance may suffer and seal failure may occur after the solder mounting process. To store the Relay after opening the moisture-proof package, place it into the original package and seal the package with adhesive tape.

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 at less than 40°C. Do not put the relay in a cold cleaning bath immediately after soldering.

### Soldering

Solder: JIS Z3282, H63A

Soldering temperature: Approx. 250°C (At 260°C if the DWS method is used.)

Soldering time: Approx. 5 s max. (Approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used.)

Be sure to adjust the level of the molten solder so that the solder will not overflow onto the PCB.

### Claw Securing Force During Automatic Insertion

During automatic insertion of Relays, make sure to set the securing force of the claws to the following values so that the Relay characteristics will be maintained.



Direction A: 4.90 N max.

Direction B: 9.80 N max.

Direction C: 9.80 N max.

Secure the claws to the area indicated by shading. Do not attach them to the center area or to only part of the Relay.

### Environmental Conditions During Operation, Storage, and Transportation

Protect the Relays from direct sunlight and keep the Relays under normal temperature, humidity, and pressure.

### Mounting Latching Relays

The Latching Relays are reset before shipping. If excessive vibration or shock is imposed, however, the Latching Relays may be set accidentally. Be sure to apply a reset signal before use. Make sure that the vibration or shock that is generated by other devices on the same panel does not exceed the rated value of the Latching Relays.

### Maximum Voltage

The maximum voltage of the coil can be obtained from the coil temperature increase and the heat-resisting temperature of coil insulating sheath material. (Exceeding the heat-resisting temperature may result in burning or short-circuiting.) The maximum voltage also involves important restrictions. Maximum voltage:

- must not cause thermal changes or deterioration of the insulating material.
- must not cause damage to other control devices.
- must not cause any harmful effect on people.
- must not cause fire.

Therefore, be sure not to exceed the maximum voltage specified in the catalog.

As a rule, the rated voltage must be applied to the coil. A voltage exceeding the rated value, however, can be applied to the coil provided that the voltage is less than the maximum voltage. It must be noted that continuous voltage application to the coil will cause a coil temperature increase which could deteriorate the coil insulation, shorten the relay's electrical life, or affect various characteristics of the relay.

### Coating

Relays mounted on PCBs may be coated or washed. Do not apply coatings or detergents containing silicone.

### Other Handling

Dropping the relay may impose excess shock that exceeds the specifications. Do not use any relay that has been dropped.

# 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.
- 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.

### V. INFORMATION; ETC.

- 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.
- Property/Confidentiality:** Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
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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.
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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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