

Door Interlock Switch

D2D

Power Switch with Minimum Contact Gap up to 3 mm.

- Minimum contact gap of 3 mm (standard models), needed in general power switches, is provided.
- Mechanism with double return spring and direct drive positive contact opening features
- Pull-on lock type for easy maintenance is also available.
- Conforms to Class II of VDE Insulation Grade.
- RoHS Compliant



Ordering Information

Type	Contact Gap	Contact Form	Part Number	
			Screw mount type	Panel mount type
Standard	3 mm min.	SPDB-NO/NC	D2D-1000	D2D-1100
		SPDB-NO	D2D-1001	D2D-1101
		SPDB-NC	D2D-1002	D2D-1102
		SPDB-NO + SPDB-NO/NC	- - -	D2D-3103
		DPDB-NO	- - -	D2D-3104
Pull-on lock	1 mm	SPDB-NO/NC	D2D-2000	D2D-2100

Note: “DB” in the contact form = “Double Break”.

Model Number Legend

D2D -

 1 2 3

1. Construction

- 1: Single pole, 3-mm contact gap
- 2: Pull-on-lock type, 1-mm contact gap
- 3: Double-pole, 3-mm contact gap

2. Mounting

- 0: Screw mount
- 1: Panel snap-fit mount

3. Contact Form

- 0: SPDB-NO/NC
- 1: SPDB-NO
- 2: SPDB-NC
- 3: SPDB-NO + SPDB-NO/NC
- 4: DPDB-NO

Specifications

■ Characteristics

Item		D2D-1000 models	D2D-2000 models	D2D-3000 models
Operating speed		10 mm/s to 1 m/s		
Operating frequency		Mechanical: 300 operations per minute max. Electrical: 30 operations per minute max.		
Contact resistance		50 mΩ max.		
Insulation resistance		100 MΩ min. (at 500 VDC)		
Dielectric strength 50/60 Hz, 1mm (See note 2)	Between terminals of same polarity	2,000 VAC	1,000 VAC	2,000 VAC
	Between terminals and ground	2,000 VAC	1,500 VAC	2,000 VAC
	Between terminals and non-current carrying metal parts	2,500 VAC	1,500 VAC	---
	Between terminals and actuator	4,000 VAC	---	4,000 VAC
Vibration resistance		Malfunction: 10 to 55 Hz, 1.5 mm double amplitude		
Shock resistance	Destruction	1,000 m/s ² (approx 100G) max.		
	Malfunction	500 m/s ² (approx. 50G) max.	300 m/s ² (approx. 30G) max.	500 m/s ² (approx. 50G) max.
Degree of protection		IEC IP40		
Degree of protection vs. electric shock		Class II		
Proof tracking index (PTI)		175		
Ambient operating temperature		-25° to 85°C (at 60% RH max.) with no icing		
Ambient operating humidity		85% max (for 5°C to 35°C)		
Life expectancy		Mechanical: 10,000,000 operations min. at 60 operations/minute Electrical: 100,000 operations min. at 30 operations/minute		
Weight		Approx. 14 g (D2D-1000)		

Note: 1. Data shown are of initial value

2. The dielectric strength shown is measured using a separator between the switch and metal mounting plate

■ Ratings (Reference values)

Type	Voltage	Resistive load		Motor load	
		NC	NO	NC	NO
Standard	125 VAC 250 VAC	16 A		4 A	
Pull-on lock	125 VAC 250 VAC	10 A		---	

Note: 1. The above values are for steady-state current and the motor load has an inrush current of 6 times the steady-state current.

2. The ratings apply under the following test conditions: Ambient Temperature = 20±2°C, Ambient Humidity = 65±5%, Operating frequency = 30 operations/min.

■ Approved Standards

UL Recognized (File No. E41515)
CSA Certified (File No. LR21642)

Rated voltage	D2D-1000	D2D-2000	D2D-3000
125 VAC	---	---	3/4 hp
250 VAC	16 A	10 A	16A, 1.5 hp

EN61058-1 (File No. 136005 VDE approval)

Rated voltage	D2D-1000	D2D-2000	D2D-3000
250 VAC	16(4) A	10 A	16(4) A

Testing conditions: 1E4 (10,000 operations), T85 (0°C to 85°C)

Note: The value in parentheses indicate motor load ratings.

EN61058-1 (File No. R9551934, TÜV Rheinland approval)

Rated voltage	D2D-3104
24 VDC	4 A

Testing conditions: 5E4 (50,000 operations), T85 (0°C to 85°C)

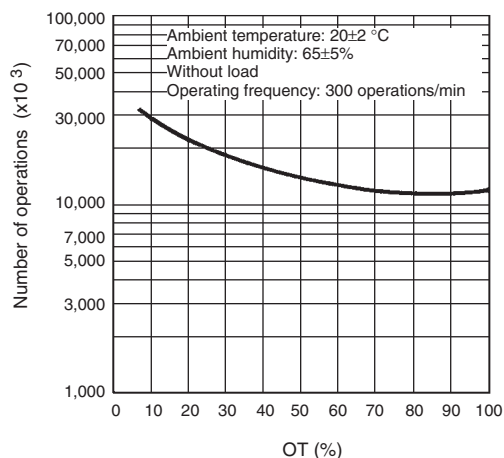
■ Contact Specifications

Item	Standard model	Pull-on lock model
Specification	Rivet	
Material	Silver	
Gap (standard value)	3 mm min.	1 mm
Inrush current	30 A max.	24 A max.
Minimum applicable load (see note)	160 mA at 5 VDC	

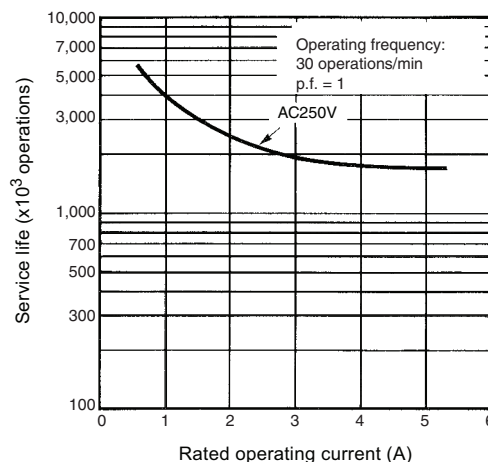
Note: Minimum applicable loads are indicated by N standard reference values. This value represents the failure rate at a 60% (λ_{60}) reliability level (JIS C5003).
The equation $\lambda_{60}=0.5 \times 10^{-6}$ / operations indicates that a failure rate of 1/2,000,000 operations can be expected at a reliability level of 60%

Engineering Data

Mechanical Service Life

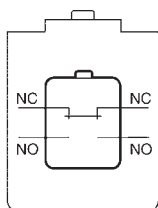


Electrical Service Life



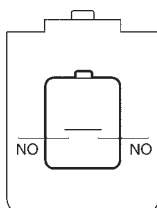
Contact Form

SPDB-NO/NC



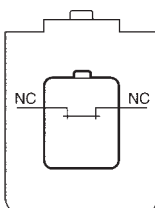
D2D-1000 D2D-2000
D2D-1100 D2D-2100

SPDB-NO



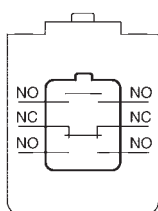
D2D-1001 D2D-1101

SPDB-NC



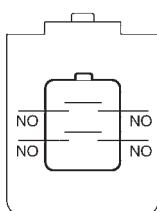
D2D-1002 D2D-1102

SPDB-NO +
SPDB-NO/NC



D2D-3103

DPDB-NO

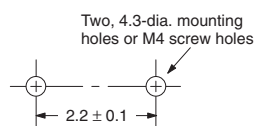


D2D-3104

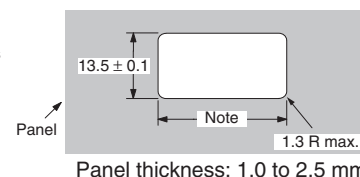
Mounting Holes

Screw mount switches may be panel mounted using M4 mounting screws with plane washers or spring washers to securely mount the switch. Tighten the screws to a torque of 0.49 to 0.69 N·m

Panel Mount Holes



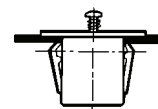
Panel Cutout Dimensions



Note: Dimension is 36.7±0.1 with a panel thickness of 1.0 mm and 37.0±0.1 with a panel thickness of 2.5 mm



Screw mount type panel



Panel mount type panel

Snap-fit panel mount switches use the panel cutout hole illustrated above. When mounting on a metal surface, be sure to provide a separator between the switch and mounting plate.

Pull-on Lock Function

When opening or closing the door, the power ON state of the switch can be checked with the door left open. By closing the door after maintenance inspection, the switch will resume the normal momentary action. (this feature is ideal for conducting the electrical continuity test, inspection, repair, etc. of the switch after its assembly.)

Example		To turn ON the power when the door is closed	To turn OFF the power when the door is open	To turn ON the power with the door left open
State	NO-NO			
	NC-NC			
Connection	NO-NO	ON	OFF	ON
	NC-NC	OFF	ON	OFF

Safety Features

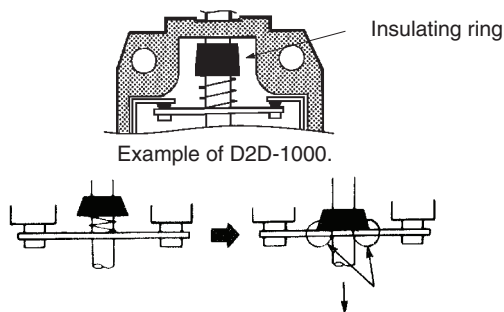
Double Spring Mechanism

Two return springs are provided for the pin plunger. Thus, if either of the springs are broken, this feature will prevent the switch from malfunctioning or short-circuiting.

(Applicable to D2D-1000 and D2D-3000 models. The D2D-2000 models with pull-on lock is not provided with this feature.)

Direct Contact Opening Mechanism

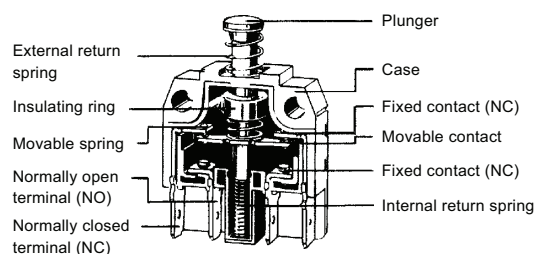
The insulating ring, identified by , will positively break the circuit if a contact weld occurs in the switch. (D2D-1000 models).



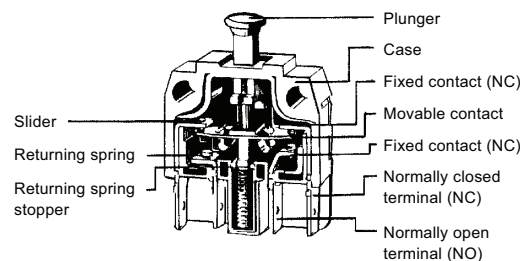
The section marked  pushes the movable contact to apply force in the direction which separates the movable contact forcibly from the fixed contact.

Structure

Standard Types



Pull-on Lock Types



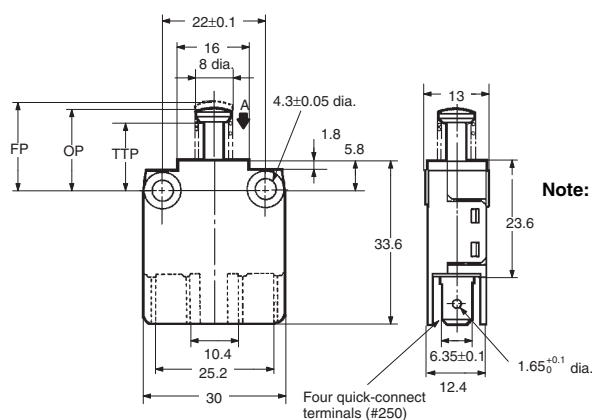
Dimensions and Operating Characteristics

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.4 mm applies to all dimensions
2. The operating characteristics are for operation in the A direction()

Standard Models

Screw Mounting

D2D-1000
D2D-1001
D2D-1002



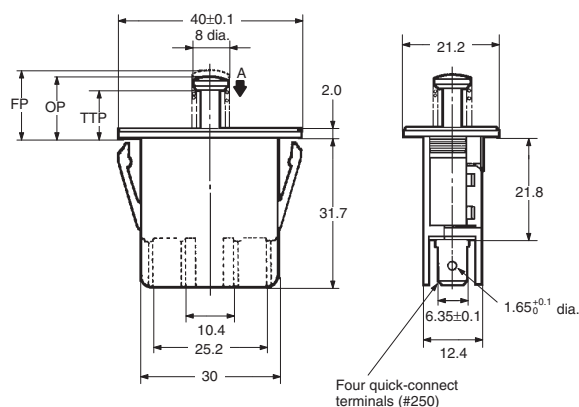
- Note:** 1. NC-OFF: The force applied to the actuator to cause it to move from the free position to the position at which the NC contact opens.
2. NO-ON: The force applied to the actuator to cause it to move from the free position to the position at which the NO contact closes

Model	D2D-1000	D2D-1001	D2D-1002
OF max.	300 gf	---	300 gf
NC-OFF	600 gf	600 gf	---
NO-ON		750 gf	
TTF max.	2.3 mm		
OT min.	5.5 mm		
FP max.	16.4 mm	17 mm	16.4 mm
OP	15.9 ± 0.4 mm	---	15.9 ± 0.4 mm
NC-OFF	12.7 ± 0.4 mm	12.7 ± 0.4 mm	---
NO-ON			
TTP max.	10 mm		

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.4 mm applies to all dimensions
 2. The operating characteristics are for operation in the A direction (▼)

Panel Mounting

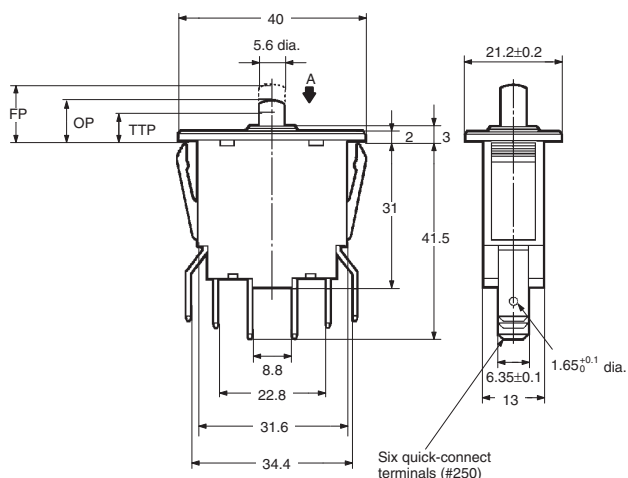
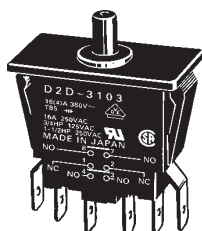
D2D-1100
 D2D-1101
 D2D-1102



Model	D2D-1100	D2D-1101	D2D-1102
OF max.	NC-OFF NO-ON	300 gf 600 gf	---
TTF max.	750 gf		
OT min.	2.3 mm		
FP max.	12.4 mm	13 mm	12.4 mm
OP	NC-OFF NO-ON	11.9 $\pm$ 0.4 mm 8.7 $\pm$ 0.4 mm	---
TTP max.	6 mm		

Panel Mounting

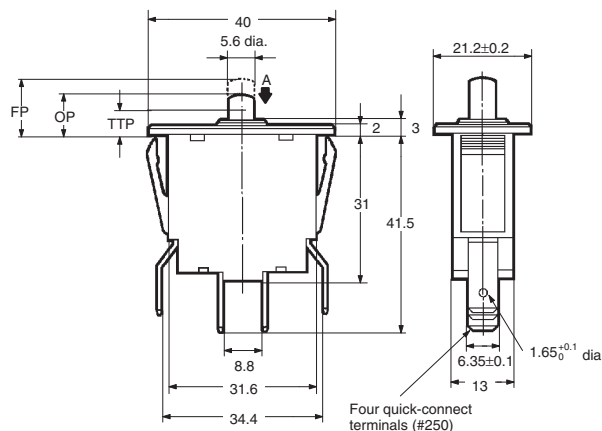
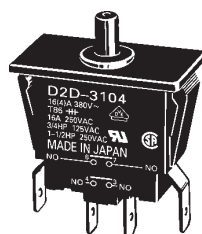
D2D-3103



Model	D2D-3103
OF max.	NC-OFF NO-ON
TTF max.	300 gf 600 gf
OT min.	1,000 gf
FP max.	2.3 mm
OP	NC-OFF NO-ON
TTP max.	11.9 $\pm$ 0.8 mm 8.7 $\pm$ 0.8 mm

Panel Mounting

D2D-3104



Model	D2D-3104
OF max.	NC-OFF NO-ON
TTF max.	---
OT min.	600 gf
FP max.	1,000 gf
OP	NC-OFF NO-ON
TTP max.	2.3 mm

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.4 mm applies to all dimensions
2. The operating characteristics are for operation in the A direction(▼)

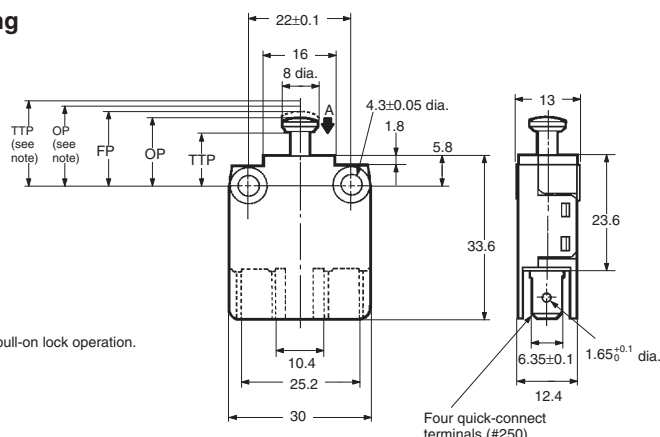
Pull-on Lock Models

Screw Mounting

D2D-2000



Note: At pull-on lock operation.

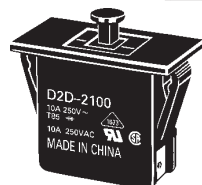


Momentary Operation (Normal Operation)

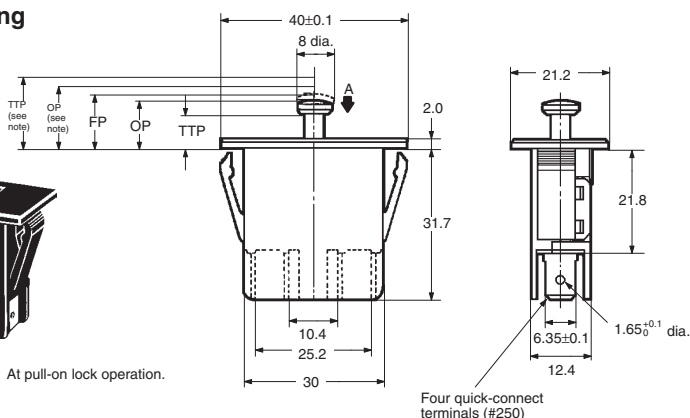
Model	D2D-2000	D2D-2100
OF max.	NC-OFF NO-ON	200 gf 300 gf
TTF max.		600 gf
OT min.		4.5 mm
FP max.	14.3 mm	10.3 mm
OP	NC-OFF NO-ON	13.5 ± 0.6 mm 12.7 ± 0.6 mm
TTP max.	8.3 mm	4.3 mm

Panel Mounting

D2D-2100



Note: At pull-on lock operation.



Pull-on Lock Operation

Model	D2D-2000	D2D-2100
OF max.	2,000 gf	
PT max.	2 mm	
OT min.	0.4 mm	
MD max.	1.5 mm	
FP max.	14.3 mm	10.3 mm
OP	15.1 ± 0.6 mm	11.1 ± 0.6 mm
TTP max.	16.5 mm	12.5 mm

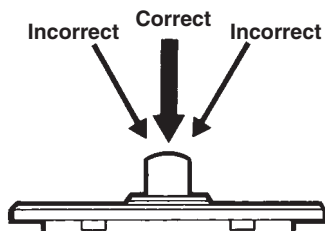
Precautions

Be sure to read the precautions and information common to all Snap Action and Detection Switches, contained in the Technical User's Guide, "Snap Action Switches, Technical Information" for correct use.

Correct Use

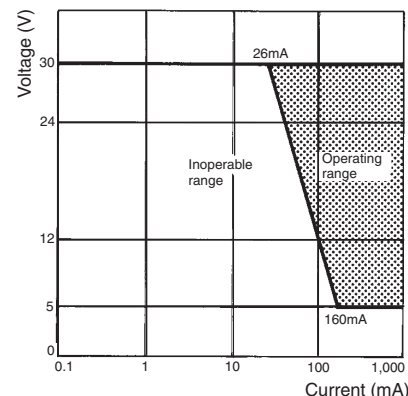
Actuation

Apply operation force to the pin plunger in the direction it operates. Applying forces laterally or from an oblique direction may damage the pin plunger.



Using Microloads

Using a model for ordinary loads to switch microloads may result in faulty operation. Instead, use the models that are designed for microloads and that operate in the following range;



However, even when using microload models within the operating range shown above, if inrush current or inductive voltage spikes occur when the contact is opened or closed, then contact wear may increase and so decrease the service life. Therefore, insert a contact protection circuit where necessary.

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.
- 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.

VI. MISCELLANEOUS

- Waiver:** No failure or delay by Seller in exercising any right and no course of dealing between Buyer and Seller shall operate as a waiver of rights by Seller.
- Assignment:** Buyer may not assign its rights hereunder without Seller's written consent.
- Law:** These Terms are governed by Illinois law (without regard to conflict of laws). Federal and state courts in Cook County, Illinois have exclusive jurisdiction for any dispute hereunder.
- 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:
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 - (ii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - (iii) Use in consumer products or any use in significant quantities.
 - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
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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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