

# Waterproof Sensor I/O Connectors XS5

## Waterproof Smartclick Connectors That Reduce Installation Work

- A newly developed lock structure that maintains compatibility with conventional, screw-type M12 connectors.
- Completely compatible with conventional screw-type M12 connectors.
- Simply insert the Connectors, then turn them approximately 1/8 of a turn to lock.
- A positive click indicates locking.
- Features the same degree of protection (IP67) as conventional, screw-type M12 connectors.



Smartclick

## Specifications

Rated current	4 A
Rated voltage	250 VDC
Contact resistance (connector)	40 mΩ max. (20 mV max., 100 mA max.)
Insulation resistance	1,000 MΩ min. (at 500 VDC)
Dielectric strength (connector)	1,500 VAC for 1 min. (leakage current: 1 mA max.)
Degree of protection	IP67 (IEC60529)
Insertion tolerance	50 times min.
Lock strength	Pulling: 100 N/15 s, Twisting: 1 N·m/15 s
Cable holding strength	100 N/15 s (for cable diameter of 6 mm)
Lock operating force	0.1 N·m to 0.25 N·m
Ambient temperature range	Operating: -25°C to 70°C

## Materials and Finish

Item	Model	XS5F	XS5H	XS5W
Contacts		Phosphor bronze/nickel base, 0.4-μm gold-plating		
Fixtures		Nickel-plated zinc alloy		
Pin Block		PBT resin (UL94V-0)		
Cover		Polyester elastomer (UL94V-0)		
O-ring		Rubber		
Cable	Standard cable	UL AWM2464, 6-mm dia. 4 cores × AWG20 (0.12/49)		
	Vibration-proof robot cable	UL AWM2464, 6-mm dia. 4 cores × AWG200 (0.08/110)		
	Oil-resistant polyurethane cable	6 dia. 4 cores × 0.5 mm <sup>2</sup> (0.12/45)		

## Connection Combinations

OMRON model No.		Smartclick Plug Connectors	M12 Plug Connectors
		XS5H, XS5W (plug side)	XS2H, XS2G XS2W (plug side), XS2R (plug side), XS2M
Smartclick Socket Connectors	XS5F, XS5W (socket side)	⊙	○
M12 Socket Connectors	XS2F, XS2C, XS2W (socket side), XS2R (socket side), XS2P	○	○

⊙ : Connected by twisting.  
○ : Connected by screwing.

Note: Smartclick is a registered trademark of the OMRON Corporation.

## ■ Problem Solving


### 1

Problem	Solution
It is troublesome to screw the connectors together.	<b>It's a twist-and-click connection.</b> An innovative new lock structure makes connection extremely simple. The lock mechanism is internal, so it will no longer become jammed by splattered fluids or dust. Also the use of a movable lock bolt makes it possible to connect the Smartclick XS5 to a screw-type M12 connector.

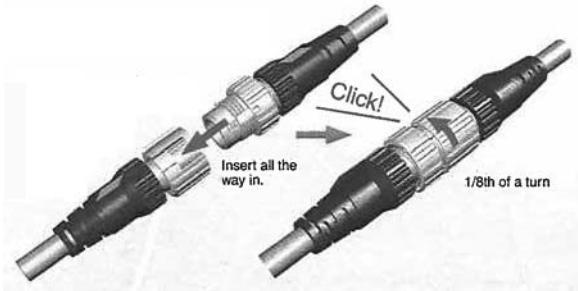
All combinations are connectable.

	XS5 Smartclick Plug Connector	M12 plug connector
XS5 Smartclick Socket Connector	Twist-and-click connection	Screw connection
M12 socket connector	Screw connection	Screw connection

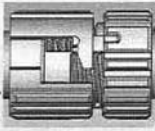
### 2

Problem	Solution
There's nothing to tell you that it's connected.	<b>The Smartclick XS5 "clicks" to tell you it's connected.</b> A positive clicking feel tells you for sure that the Connector is securely locked. 

### 3

Problem	Solution
It's difficult to keep track of locking torque values.	<b>Locking is done with approximately 1/8th of a turn.</b> The Smartclick XS5 has the industry's shortest locking rotation of 1/8th of a turn. There's no need to keep track of locking torque, and this greatly reduces time and effort when wiring. 

### 4

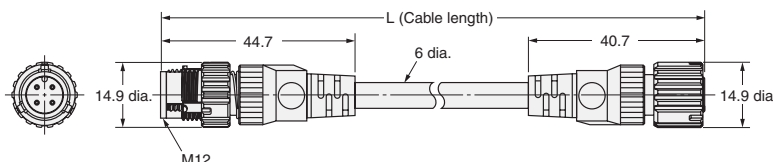
Problem	Solution
The connection sometimes vibrates loose.	<b>A bayonet lock mechanism is used.</b> By using a bayonet mechanism, which is a common locking method, the Smartclick XS5 eliminates any concerns about loosening. 

# Connectors Connected to Cable, Socket and Plug on Cable Ends XS5W

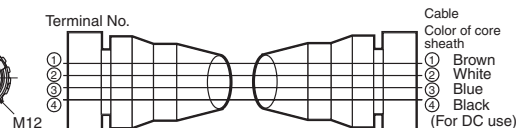
- XS5W-D421-□81-A** Standard Cable
- XS5W-D421-□81-F** Vibration-proof Robot Cable
- XS5W-D421-□81-P** Oil-resistant Polyurethane Cable *NEW*



## ■ Dimensions



## Wiring Diagram for 4 Cores



**Note:** The cover of the Standard Cable (XS5W-D421-□81-A) is black, and the cover of the Vibration-proof Robot Cable (XS5W-D421-□81-F) is warm gray.

## ■ Ordering Information

Cable type	Cable connection directions	No. of cable cores	Cable length (m)	Model	Minimum order
Standard cable	Straight/straight	4	1	<b>XS5W-D421-C81-A</b>	10
			2	<b>XS5W-D421-D81-A</b>	
			3	<b>XS5W-D421-E81-A</b>	
			5	<b>XS5W-D421-G81-A</b>	5
			10	<b>XS5W-D421-J81-A</b>	
Vibration-proof robot cable	Straight/straight	4	1	<b>XS5W-D421-C81-F</b>	10
			2	<b>XS5W-D421-D81-F</b>	
			3	<b>XS5W-D421-E81-F</b>	
			5	<b>XS5W-D421-G81-F</b>	5
			10	<b>XS5W-D421-J81-F</b>	
Oil-resistant polyurethane cable <i>NEW</i>	Straight/straight	4	2	<b>XS5W-D421-D81-P</b>	10
			5	<b>XS5W-D421-G81-P</b>	5
			10	<b>XS5W-D421-J81-P</b>	

**Note:** Ask your OMRON representative about other specifications.

## ■ Model Number Legend

Use this model number legend to identify products from their model number. When ordering, use a model number from the table in *Ordering Information*.

**XS5W - D□2□ - □□1 - □**  
 1 2 3 4 5 6 7 8 9

### 1. Type

W: Connectors connected to cable, socket and plug on cable ends

### 2. AC/DC (Mating Section Form)

D: DC

### 3. Connector Poles

4: 4 poles

### 4. Contact Plating

2: 0.4-μm gold plating

### 5. Cable Connection Directions

1: Straight/straight

### 6. Cable Length

- A: 0.3 m      G: 5 m
- B: 0.5 m      H: 7 m
- C: 1 m        J: 10 m
- D: 2 m        K: 15 m
- E: 3 m        L: 20 m
- F: 4 m

### 7. Connections

8: ① Brown, ② White, ③ Blue, ④ Black  
 (Numbers inside circles are terminal numbers.)

### 8. Connectors on One End/Both Ends

1: Both ends

### 9. Cable Specifications

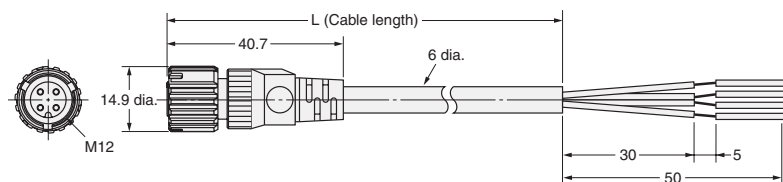
- A: Standard cable
- F: Vibration-proof robot cable
- P: Oil-resistant polyurethane cable

# Connector Connected to Cable, Socket on One Cable End XS5F

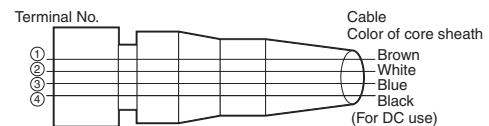
- XS5F-D421-□80-A** Standard Cable
- XS5F-D421-□80-F** Vibration-proof Robot Cable
- XS5F-D421-□80-P** Oil-resistant Polyurethane Cable *NEW*



## ■ Dimensions



## Wiring Diagram for 4 Cores



**Note:** The cover of the Standard Cable (XS5F-D421-□81-A) is black, and the cover of the Vibration-proof Robot Cable (XS5F-D421-□81-F) is warm gray.

## ■ Ordering Information

Cable type	Cable connection direction	No. of cable cores	Cable length (m)	Model	Minimum order
Standard cable	Straight	4	1	<b>XS5F-D421-C80-A</b>	10
			2	<b>XS5F-D421-D80-A</b>	
			3	<b>XS5F-D421-E80-A</b>	
			5	<b>XS5F-D421-G80-A</b>	5
			10	<b>XS5F-D421-J80-A</b>	
Vibration-proof robot cable	Straight	4	1	<b>XS5F-D421-C80-F</b>	10
			2	<b>XS5F-D421-D80-F</b>	
			3	<b>XS5F-D421-E80-F</b>	
			5	<b>XS5F-D421-G80-F</b>	5
			10	<b>XS5F-D421-J80-F</b>	
Oil-resistant polyurethane cable <i>NEW</i>	Straight	4	2	<b>XS5F-D421-D80-P</b>	10
			5	<b>XS5F-D421-G80-P</b>	5
			10	<b>XS5F-D421-J80-P</b>	

**Note:** Ask your OMRON representative about other specifications.

## ■ Model Number Legend

Use this model number legend to identify products from their model number. When ordering, use a model number from the table in *Ordering Information*.

**XS5F** - □□2□ - □□0 - □  
 1 2 3 4 5 6 7 8 9

### 1. Type

F: Connector connected to cable, socket on one cable end

### 2. AC/DC (Mating Section Form)

D: DC

### 3. Connector Poles

4: 4 poles

### 4. Contact Plating

2: 0.4-μm gold plating

### 5. Cable Connection Direction

1: Straight

### 6. Cable Length

- A: 0.3 m      G: 5 m
- B: 0.5 m      H: 7 m
- C: 1 m        J: 10 m
- D: 2 m        K: 15 m
- E: 3 m        L: 20 m
- F: 4 m

### 7. Connections

8: ① Brown, ② White, ③ Blue, ④ Black (Numbers inside circles are terminal numbers.)

### 8. Connectors on One End/Both Ends

0: One end

### 9. Cable Specification

- A: Standard cable
- F: Vibration-proof robot cable
- P: Oil-resistant polyurethane cable

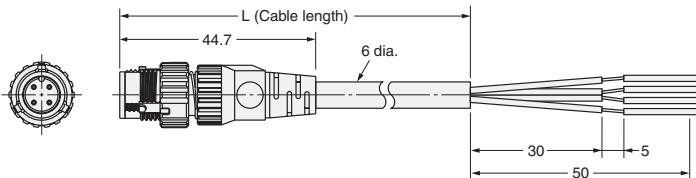
**XS5H-D421-□80-A** Standard Cable

**XS5H-D421-□80-F** Vibration-proof Robot Cable

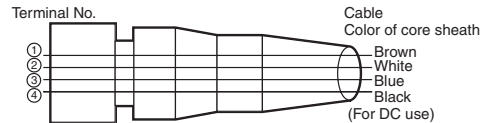
**XS5H-D421-□80-P** Oil-resistant Polyurethane Cable *NEW*



## ■ Dimensions



## Wiring Diagram for 4 Cores



**Note:** The cover of the Standard Cable (XS5W-D421-□81-A) is black, and the cover of the Vibration-proof Robot Cable (XS5W-D421-□81-F) is warm gray.

## ■ Ordering Information

Cable type	Cable connection direction	No. of cable cores	Cable length (m)	Model	Minimum order
Standard cable	Straight	4	0.3	<b>XS5H-D421-A80-A</b>	10
			1	<b>XS5H-D421-C80-A</b>	
			2	<b>XS5H-D421-D80-A</b>	
			5	<b>XS5H-D421-G80-A</b>	5
Vibration-proof robot cable	Straight	4	0.3	<b>XS5H-D421-A80-F</b>	10
			1	<b>XS5H-D421-C80-F</b>	
			2	<b>XS5H-D421-D80-F</b>	
			5	<b>XS5H-D421-G80-F</b>	5
Oil-resistant polyurethane cable <i>NEW</i>	Straight	4	0.3	<b>XS5H-D421-A80-P</b>	10
			2	<b>XS5H-D421-D80-P</b>	5
			5	<b>XS5H-D421-G80-P</b>	

**Note:** Ask your OMRON representative about other specifications.

## ■ Model Number Legend

Use this model number legend to identify products from their model number. When ordering, use a model number from the table in *Ordering Information*.

**XS5H** - □□21 - □□0 - □  
 1 2 3 4 5 6 7 8 9

- 1. Type**  
F: Connector connected to cable, plug on one cable end
- 2. AC/DC (Mating Section Form)**  
D: DC
- 3. Connector Poles**  
4: 4 poles
- 4. Contact Plating**  
2: 0.4- $\mu$ m gold plating
- 5. Cable Connection Direction**  
1: Straight
- 6. Cable Length**  
A: 0.3 m G: 5 m  
B: 0.5 m H: 7 m  
C: 1 m J: 10 m  
D: 2 m K: 15 m  
E: 3 m L: 20 m  
F: 4 m
- 7. Connections**  
8: ① Brown, ② White, ③ Blue, ④ Black (Numbers inside circles are terminal numbers)
- 8. Connectors on One End/Both Ends**  
0: One end
- 9. Cable Specifications**  
A: Standard cable  
F: Vibration-proof robot cable  
P: Oil-resistant polyurethane cable

## ■ Connecting the Smartclick XS5

### 1. Connecting the Smartclick XS5 Plug and Socket

- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.



- Hold the knurled socket grip, then insert the projection on the plug into the groove of the socket.



- Turn the knurled grips of the socket clockwise approximately 45 degrees in respect to the plug. A click will indicate that the Connectors are locked. The locking condition can also be confirmed by the alignment marks on the plug and socket.



### 2. Connecting the Smartclick XS5 and XS2

- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.
- In the same way as when connecting two XS2 Connectors, screw the knurled grip in the clockwise direction.
- Use your fingers to tighten the Connectors sufficiently.

- The application examples provided in this catalog are for reference only. Check functions and safety of the equipment before use.
- Never use the products for any application requiring special safety requirements, such as nuclear energy control systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, or other 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 products are properly rated and installed for the intended use within the overall equipment or system.

## ■ Safety Precautions

### Precautions for Correct Use

Do not use the Connectors in an atmosphere or environment that exceeds the specifications.

### Connector Connection and Disconnection

- When connecting or disconnecting Connectors, be sure to hold the Connectors by hand.
- Do not hold the cable when disconnecting Connectors.
- When joining Connectors, be sure to insert the plug all the way to the back of the socket before attempting to lock the Connectors.
- Do not use tools of any sort to join the Connectors. Always use your hands. Pliers or other tools may damage the Connectors.
- When joining the Connectors to XS2 or other M12 Connectors, tighten the lock by hand to a torque of 0.39 to 0.49 N·m.

### Wiring

- Always confirm wiring diagrams before wiring sensors, limit switches, or other devices.
- Lay the cables so that external force is not applied to the Connectors. Otherwise, the degree of protection (IP67) may not be achieved.

### Degree of Protection

- The degree of protection of Connectors (IP67) is not for a fully watertight structure. Do not the Connectors underwater.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.

## Omron Electronic Components, LLC

### Terms and Conditions of Sales

#### I. GENERAL

- Definitions:** The words used herein are defined as follows.
  - Terms:** These terms and conditions
  - Seller:** Omron Electronic Components LLC and its subsidiaries
  - Buyer:** The buyer of Products, including any end user in section III through VI
  - Products:** Products and/or services of Seller
  - Including:** Including without limitation
- Offer/Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- Distributor:** Any distributor shall inform its customer of the contents after and including section III of these Terms.

#### II. SALES

- Prices/Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
- Discounts:** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest:** Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders:** Seller will accept no order less than 200 U.S. dollars net billing.
- Currencies:** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals:** Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes:** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
- Financial:** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
- Cancellation/Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- Force Majeure:** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
- Shipping/Delivery:** Unless otherwise expressly agreed in writing by Seller:
  - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
  - Delivery and shipping dates are estimates only; and
  - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier must be presented in detail in writing to Seller within 30 days of receipt of shipment.

#### III. PRECAUTIONS

- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
  - Outdoor use, use involving potential chemical contamination or electrical interference.
  - Use in consumer Products or any use in significant quantities.

- Energy control systems, combustion systems, railroad systems, aviation medical equipment, amusement machines, vehicles, safety equipment, 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 PRODUCT AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED 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 SPECIFIC SELLER.
  - Programmable Products:** Seller shall not be responsible for the Buyer's program 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 (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER MATTERS INCLUDING 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 originally shipped with Buyer responsible for labor charges for removal or rework thereof) the non-complying Product or, at Seller's election, to repay or credit 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 Product handled, stored, installed and maintained and not subject to contamination, 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 CONNECTION WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL THE LIABILITY OF SELLER OR ITS AFFILIATES EXCEED THE INDIVIDUAL PURCHASE PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.
- Indemnities:** Buyer shall indemnify and hold harmless Seller, its affiliates and 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 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 property of Seller and its affiliates and Buyer shall not attempt to duplicate it 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 that is based on a claim that any Product made to Buyer specifications infringes intellectual property rights of another party.
- Property/Confidentiality:** Notwithstanding any charges to Buyer for engineering, tooling, all engineering and tooling shall remain the exclusive property of Seller. Information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its employees and strictly prevent disclosure to any third party.
- Performance Data:** Performance data is provided as a guide in determining and does not constitute a warranty. It may represent the result of Seller's tests and the users must correlate it to actual application requirements.
- Change In Specifications:** Product specifications and description may be changed from time to time based on improvements or other reasons. It is Seller's practice to change 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 documents 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 orders 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 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 and state courts in 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 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

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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.

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