

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.



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/H/W/R	XS5M/P
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)	—
Seal resin		—	Epoxy resin (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 × AWG20 (0.08/110)	—
	Oil-resistant polyurethane cable	6 dia. 4 cores × 0.5 mm ² (0.12/45)	—
Power supply wires		—	UL 1007 AWG20

Connection Combinations

OMRON model No.		Smartclick™ Plug Connectors	M12 Plug Connectors
		XS5H XS5W (plug side) XS5R (plug side) XS5M	XS2H, XS2G XS2W (plug side) XS2R (plug side) XS2M
Smartclick™ Socket Connectors	XS5F XS5W (socket side) XS5R (socket side) XS5P	◎	○
M12 Socket Connectors	XS2F, XS2C XS2W (socket side) XS2R (socket side) XS2P	○	○

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

◎: Connected by Smartclick™ twisting.
○: Connected by screwing.

■ Problem Solving


1

Problem	Solution
It is troublesome to screw the connectors together.	It's a twist-and-click connection. 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.

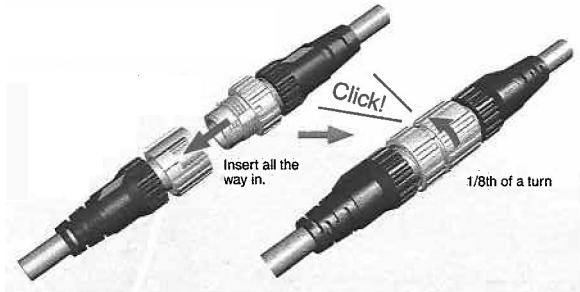
All combinations are connectable.

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

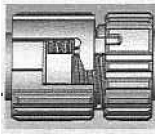
2

Problem	Solution
There's nothing to tell you that it's connected.	The Smartclick™ XS5 "clicks" to tell you it's connected. 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.	Locking is done with approximately 1/8th of a turn. 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.	A bayonet lock mechanism is used. By using a bayonet mechanism, which is a common locking method, the Smartclick™ XS5 eliminates any concerns about loosening. 

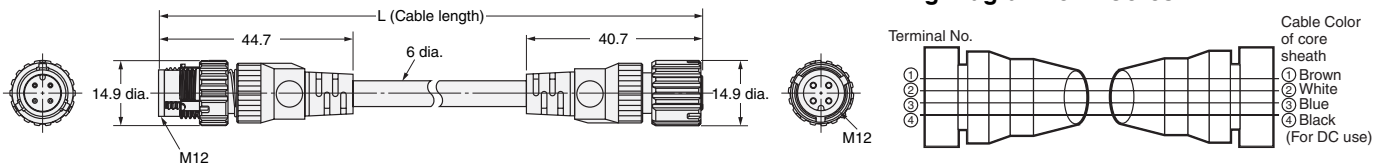
Connectors Connected to Cable, Socket and Plug on Cable Ends XS5W

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



■ Dimensions

(Unit: mm)



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	Standard pack quantity
Standard cable	Straight	4	1	XS5W-D421-C81-A	10
			2	XS5W-D421-D81-A	
			3	XS5W-D421-E81-A	
			5	XS5W-D421-G81-A	5
			10	XS5W-D421-J81-A	
Vibration-proof robot cable	Straight	4	1	XS5W-D421-C81-F	10
			2	XS5W-D421-D81-F	
			3	XS5W-D421-E81-F	
			5	XS5W-D421-G81-F	5
			10	XS5W-D421-J81-F	
Oil-resistant polyurethane cable	Straight	4	2	XS5W-D421-D81-P	10
			5	XS5W-D421-G81-P	5
			10	XS5W-D421-J81-P	

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

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

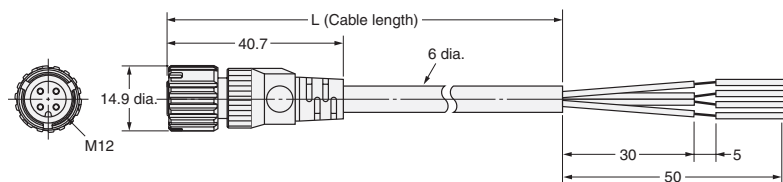
XS5F

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

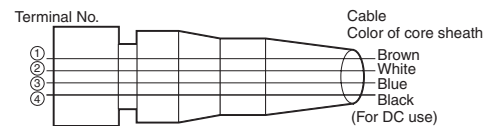


■ Dimensions

(Unit: mm)



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	Standard pack quantity
Standard cable	Straight	4	1	XS5F-D421-C80-A	10
			2	XS5F-D421-D80-A	
			3	XS5F-D421-E80-A	
			5	XS5F-D421-G80-A	5
			10	XS5F-D421-J80-A	
Vibration-proof robot cable	Straight	4	1	XS5F-D421-C80-F	10
			2	XS5F-D421-D80-F	
			3	XS5F-D421-E80-F	
			5	XS5F-D421-G80-F	5
			10	XS5F-D421-J80-F	
Oil-resistant polyurethane cable	Straight	4	2	XS5F-D421-D80-P	10
			5	XS5F-D421-G80-P	5
			10	XS5F-D421-J80-P	

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

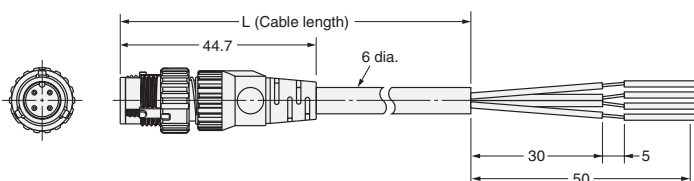
Connector Connected to Cable, Plug on One Cable End XS5H

- XS5H-D421-□80-A** Standard Cable
- XS5H-D421-□80-F** Vibration-proof Robot Cable
- XS5H-D421-□80-P** Oil-resistant Polyurethane Cable

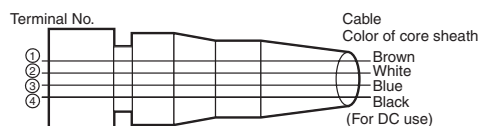


■ Dimensions

(Unit: mm)



Wiring Diagram for 4 Cores



Note: The cover of the Standard Cable (XS5H-D421-□81-A) is black, and the cover of the Vibration-proof Robot Cable (XS5H-D421-□81-F) is warm gray

■ Ordering Information

Cable type	Cable connection direction	No. of cable cores	Cable length (m)	Model	Standard pack quantity
Standard cable	Straight	4	0.3	XS5H-D421-A80-A	10
			1	XS5H-D421-C80-A	
			2	XS5H-D421-D80-A	
			5	XS5H-D421-G80-A	5
Vibration-proof robot cable	Straight	4	0.3	XS5H-D421-A80-F	10
			1	XS5H-D421-C80-F	
			2	XS5H-D421-D80-F	
			5	XS5H-D421-G80-F	5
Oil-resistant polyurethane cable	Straight	4	0.3	XS5H-D421-A80-P	10
			2	XS5H-D421-D80-P	5
			5	XS5H-D421-G80-P	

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-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 Specifications

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

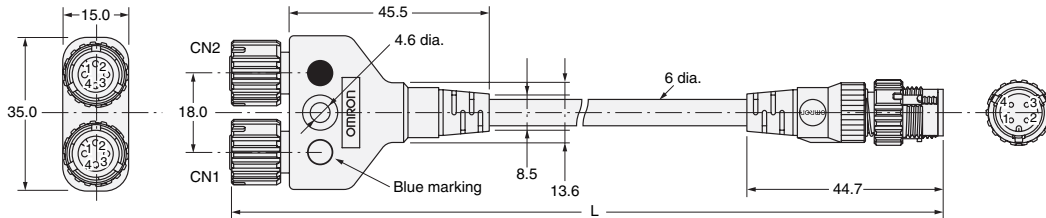
Y-Joint Plug/Socket Connectors

XS5R NEW

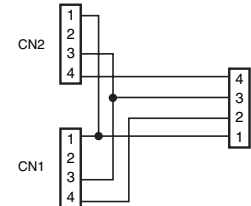
■ Dimensions (Unit: mm)



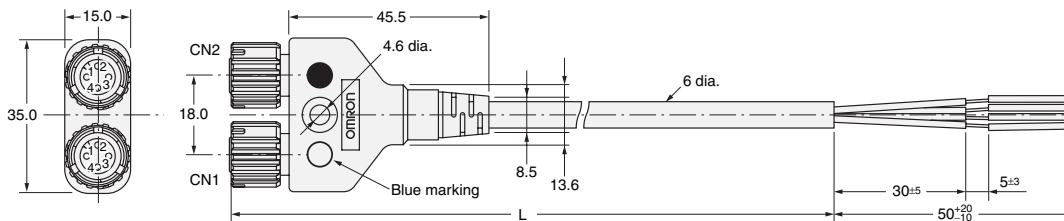
XS5R-D426-□11-F Connectors on Both Ends (Y-Joint Plug/Socket)



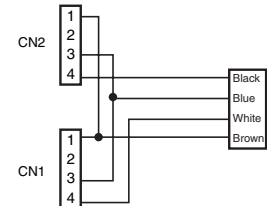
Wiring Diagram



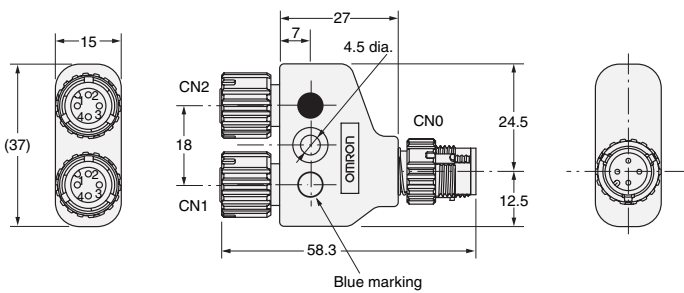
XS5R-D426-□10-F Connectors on One Cable End (Y-Joint Socket)



Wiring Diagram

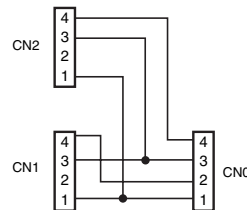


XS5R-D426-□ Y-Joint Plug/Socket without Cable

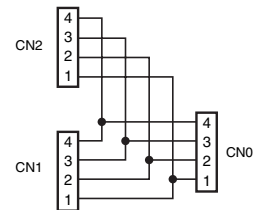


Wiring Diagram

XS5R-D426-1



XS5R-D426-5



■ Ordering Information

Cable	Connector	Cable length (m)	Model	Standard pack quantity
With cable	Connectors on both cable ends	0.5	XS5R-D426-B11-F	5
		1	XS5R-D426-C11-F	
		2	XS5R-D426-D11-F	
		3	XS5R-D426-E11-F	
	Connector on one cable end	2	XS5R-D426-D10-F	
		5	XS5R-D426-G10-F	
With no cable	Y-Joint Plug/Socket	---	XS5R-D426-1	10
			XS5R-D426-5	

Note: 1. Ask your OMRON representative about other models and additional data.

2. XS2G Assembled Connectors with screw connections cannot be connected to both CN1 and CN2 at the same time.

Panel-mounting Sockets

XS5P NEW

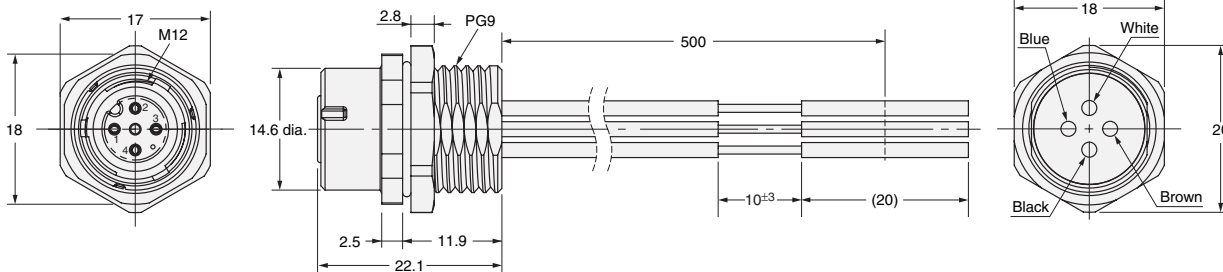
■ Dimensions

(Unit: mm)



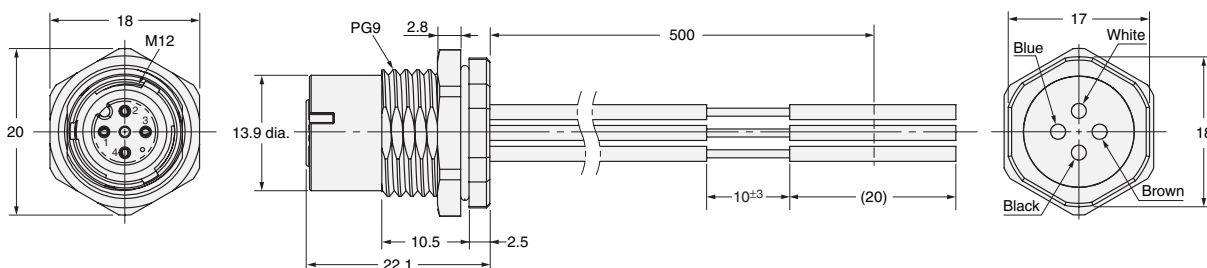
XS5P-D426-5

Front Panel-mounting Sockets for Rear Lock Nuts

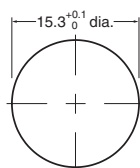


XS5P-D427-5

Rear Panel-mounting Sockets for Front Lock Nuts



■ Panel Cutout



Panel Cutout Dimension
Panel thickness = 1 to 4 mm

- Note:**
1. The panel cutout dimension is the same for Front-locking and Rear-locking Sockets.
 2. Rotational positioning is not possible for connector rotation.

■ Wiring and Wire Specifications

Wiring

Pin number	Color
1	Brown
2	White
3	Blue
4	Black

Wire Specifications

Item	Specification	
Specification	UL1007	
Nominal size	AWG20	
Configuration	Number of wires	21
	Wire diameter	0.18
	Standard outer diameter	1.8

■ Ordering Information

Type	Lock	Cable length (m)	Model	Standard pack quantity
With cable	Rear lock	0.5	XS5P-D426-5	10
	Front lock		XS5P-D427-5	

Panel-mounting Plugs

XS5M NEW

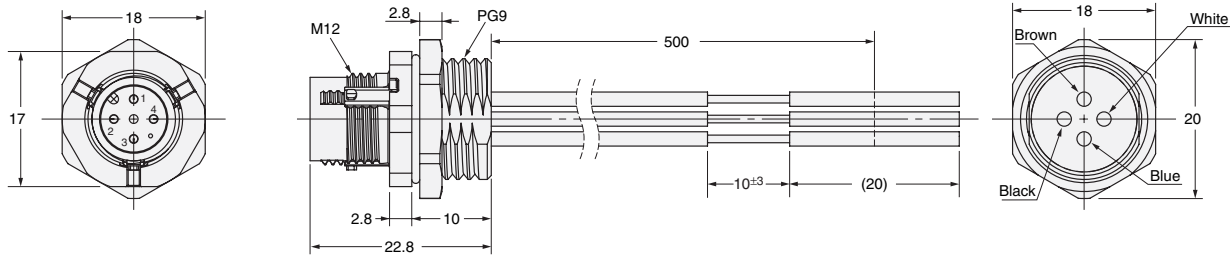
■ Dimensions

(Unit: mm)



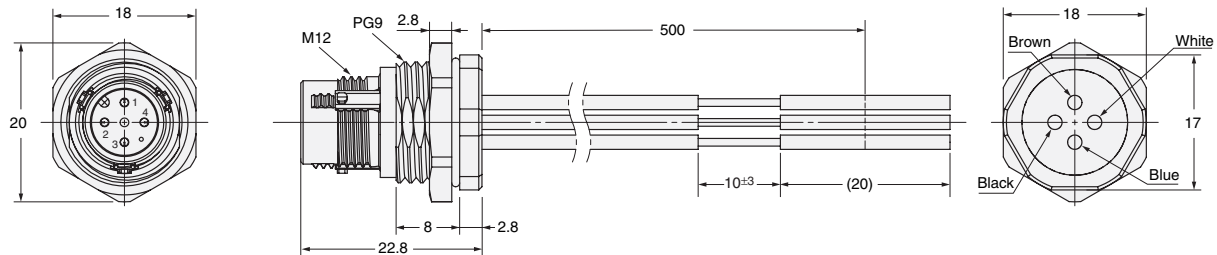
XS5M-D426-5

Front Panel-mounting Plugs for Rear Lock Nuts



XS5M-D427-5

Rear Panel-mounting Plugs for Front Lock Nuts



■ Panel Cutout



Panel Cutout Dimension
Panel thickness = 1 to 4 mm

- Note:**
1. The panel cutout dimension is the same for Front-locking and Rear-locking Sockets.
 2. Rotational positioning is not possible for connector rotation.

■ Wiring and Wire Specifications

Wiring

Pin number	Color
1	Brown
2	White
3	Blue
4	Black

Wire Specifications

Item	Specification	
Specification	UL1007	
Nominal size	AWG20	
Configuration	Number of wires	21
	Wire diameter	0.18
	Standard outer diameter	1.8

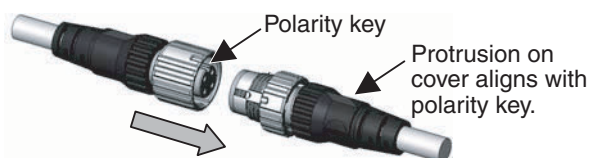
■ Ordering Information

Type	Lock	Cable length (m)	Model	Standard pack quantity
With cable	Rear lock	0.5	XS5M-D426-5	10
	Front lock		XS5M-D427-5	

■ Connecting the Smartclick™ XS5

1. Connecting the Smartclick™ XS5 Plug and Socket

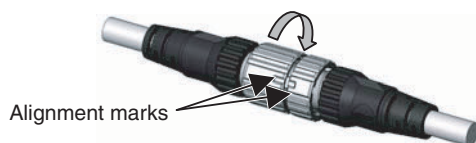
- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.



- 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

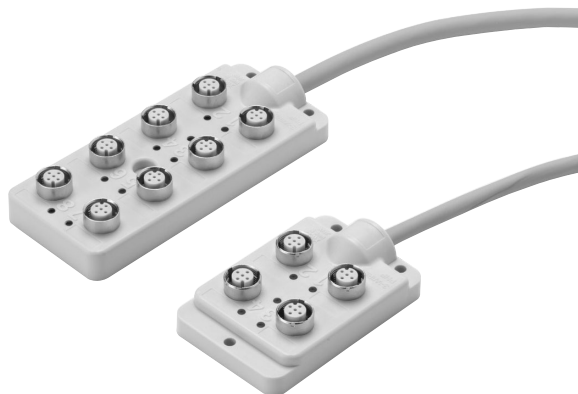
- The degree of protection of Connectors (IP67) is not for a fully watertight structure. Do not use the Connectors underwater.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.

Connector Terminal Boxes

XW3D NEW

Simple Wiring of Sensor Actuators

- Greatly reduces wiring work in combination with the XS5 Smartclick™.
- Insert the connector and turn 1/8 of a turn to lock the connectors.
- Higher rated current to enable output applications.
- Compatible with other M12 screw connectors.
- Degree of protection : IP67 (IEC60529)



■ Ratings and Specifications

Rated current	4 A/port, 12 A/Box (power line)
Rated voltage	10 to 30 VDC
Contact resistance (connector)	40 mΩ max. (20 mV max., 100 mA max.)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength (connector)	500 VAC for 1 min (leakage current: 1 mA max.)
Degree of protection	IP67 (IEC60529)
Insertion tolerance	50 times min.
Lock strength	Tensile: 100 N/15 s, Torsion: 1 N·m/15 s
Cable holding strength	100 N/15 s
Lock operating force	0.1 N·m to 0.25 N·m
Ambient operating temperature range	-25 to 70°C

■ Materials and Finish

Item	Materials/finish
Contacts	Brass/nickel base, 0.4-μm gold-plating
Fixtures	Nickel-plated zinc alloy
Case	PBT resin (UL94V-O), light gray
Bushing	Rubber
O-ring	Rubber
PCB	Glass epoxy board
Sealing resin	Urethane resin (UL94V-0)
Cable	UL AWM2464 Signal lines: AWG22 Power and ground lines: AWG18

■ Connection Combinations

OMRON Model No.		Twist-and-Click Plug Connectors	M12 Plug Connectors
		XS5H XS5W (plug end) XS5R (plug end)	XS2H, XS2G XS2W (plug end) XS2R (plug end)
Connector Terminal Box	XW3D	⊗	○

⊗: Connected by Smartclick™ twisting
○: Connected by screwing.

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

Ordering Information

Sensor type and wiring		3-Wire DC NPN/2-Wire DC 3-4	2-Wire DC 1-4/Without polarity 3-4	3-Wire DC PNP/2-Wire DC 1-4
Actuator wiring		Actuator wiring 1-4		Actuator wiring 3-4
No. of ports	No. of I/O	Model	Model	Model
4	4	XW3D-P455-G11	XW3D-P452-G11	XW3D-P453-G11
8	8	XW3D-P855-G11	XW3D-P852-G11	XW3D-P853-G11
4	8	XW3D-P458-G11	—	XW3D-P457-G11

- Note:** 1. "1-4" and "3-4" are the connector pin numbers that are wired.
 2. All cables are 5 m long.

Waterproof Cover (Sold Separately)

XS2Z-22



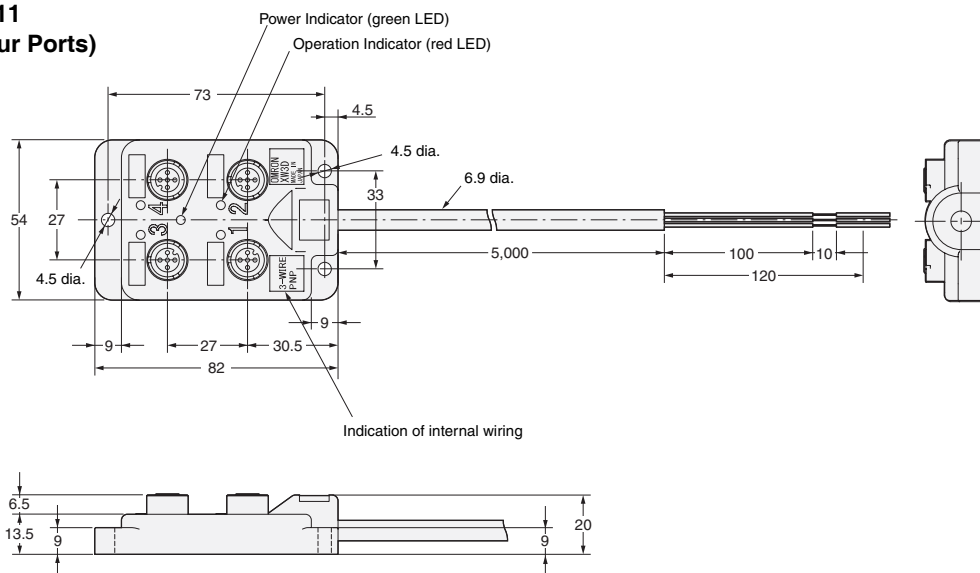
Model	No. per box	Material
XS2Z-22	50	Brass with Ni plating

- Note:** 1. The XW3D/XW3B/XW3A comes with a dust cover. Use the optional XS2Z-22 Waterproof Cover when an IP67 degree of protection is required.

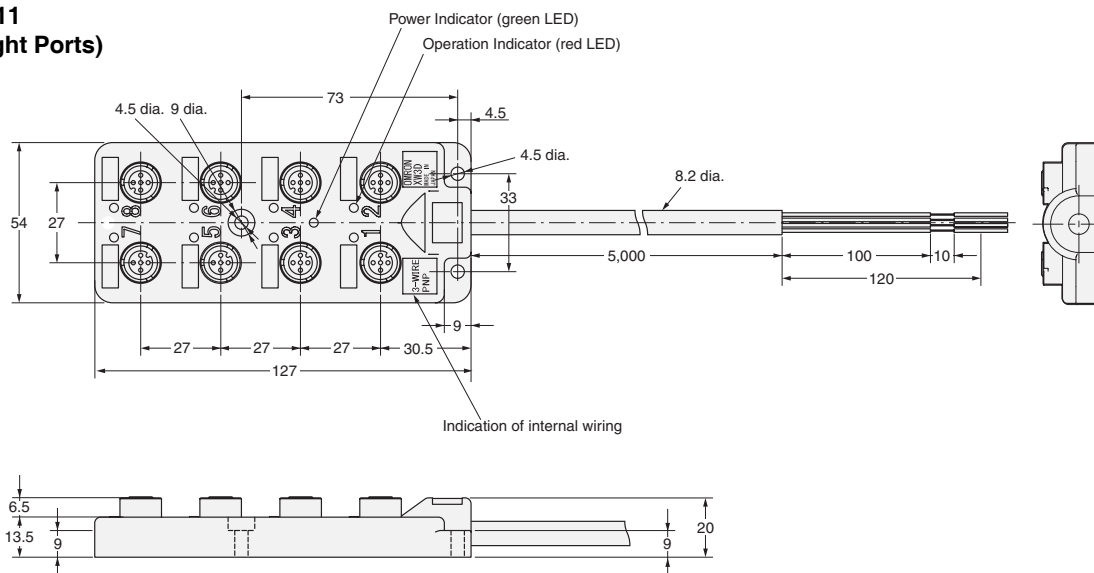
Dimensions

(Unit : mm)

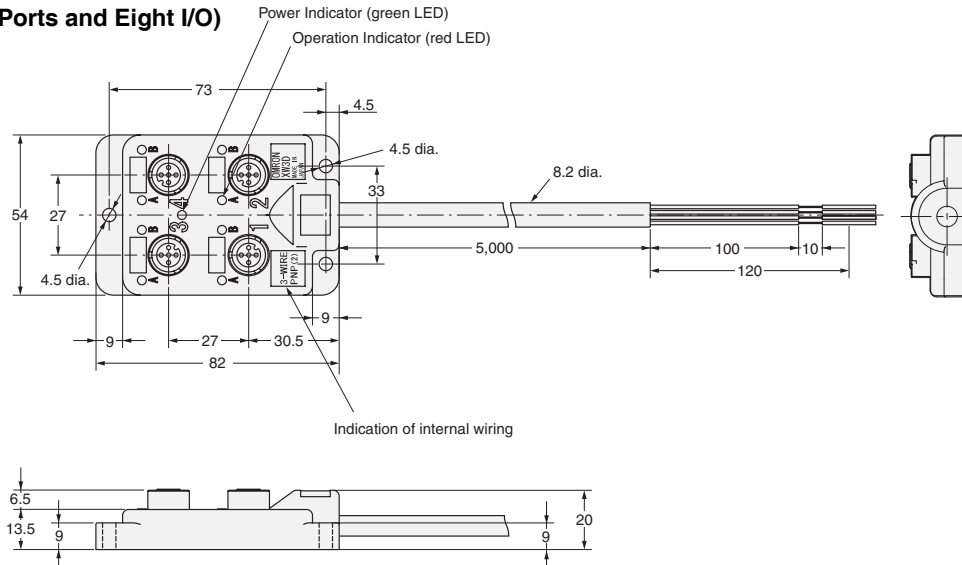
XW3D-P45□-G11
 (Model with Four Ports)



XW3D-P85□-G11
 (Model with Eight Ports)



XW3D-P457-G11
(Model with Four Ports and Eight I/O)



■ Wiring Diagrams

Models with One I/O and One Port

NPN Sensor Specifications
XW3D-P□55-□11

for 3-Wire DC NPN,
 2-Wire DC (Without polarity 3-4), and
 Actuator (1-4)

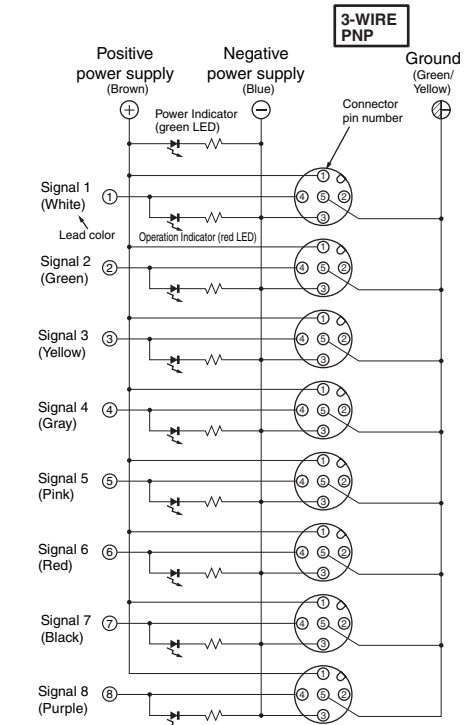
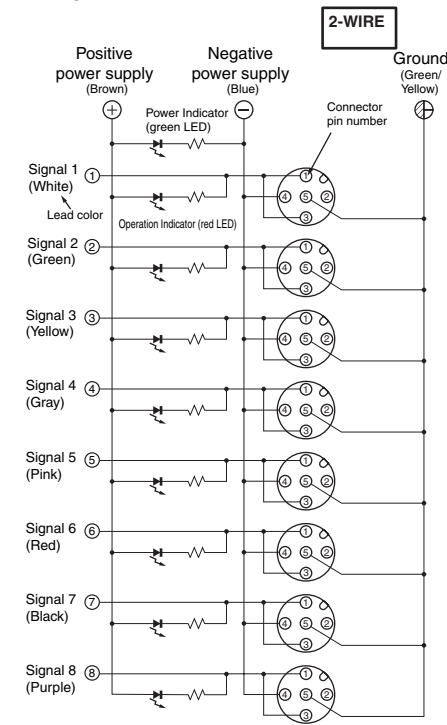
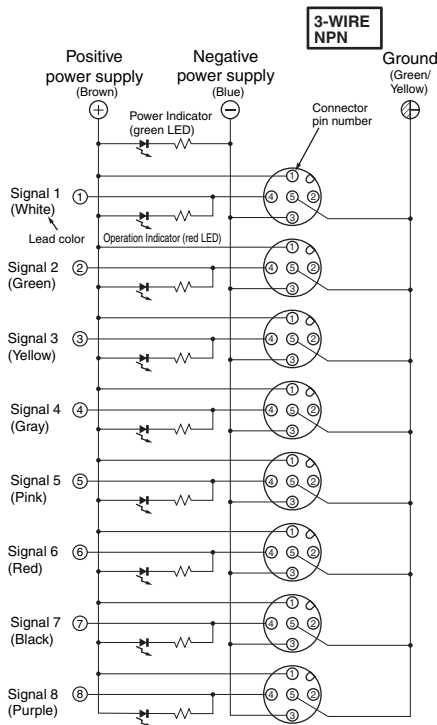
2-Wire Sensor Specifications
XW3D-P□52-□11

for 2-Wire DC (polarity 1-4, without
 polarity 3-4)

PNP Sensor Specifications
XW3D-P□53-□11

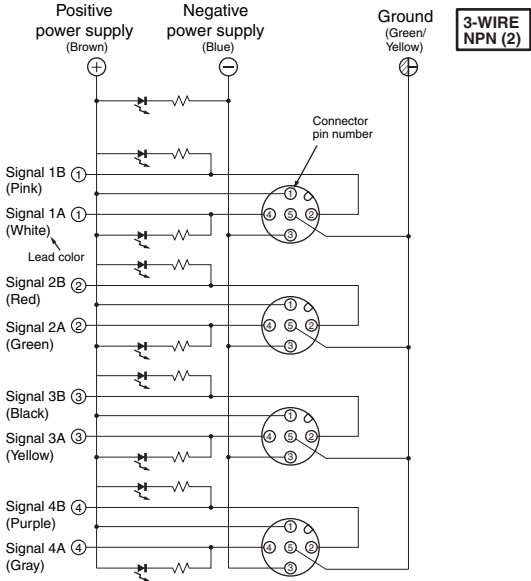
for 3-Wire DC PNP,
 2-Wire DC (with polarity 1-4), and
 Actuator (3-4)

Note: Cannot be used with NPN-type Photoelectric and Proximity Sensors. Cannot be used with Proximity Sensors with polarity 3-4.

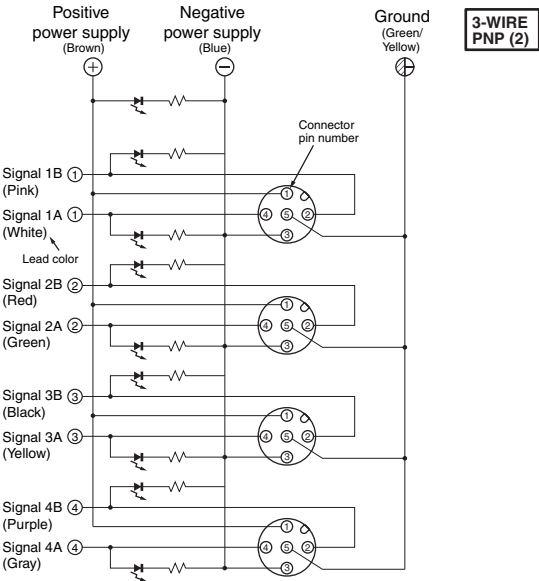


- Note:**
1. The above wiring diagrams are for eight-port use.
 2. Figures in parentheses indicate lead colors.
 3. The expression "white/red" means white and red stripes.
 4. Here, "1-4" and "3-4" are pin numbers.
 5. Contact numbers 5 through 8 in the above diagrams do not exist on Terminal Boxes with four ports. The lead colors for signals 1 through 4, power supply, and ground are the same.

Models with Two I/O and One Port
XW3D-P458-G11
for 3-Wire DC NPN and Actuator (1-4 or 1-2)



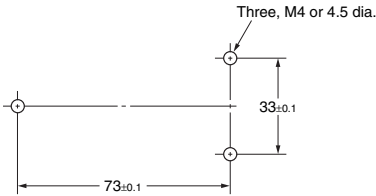
XW3D-P457-G11
for 3-Wire PNP and Actuator (3-4 or 3-2)



Note: Colors given in the connection diagram are lead colors.

Mounting Dimensions

(Unit: mm)



Note: Mounting dimensions are the same for any models.

Safety Precautions

Precautions for Correct Use

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

Connector Connection and Disconnection

- Join the connectors according to the procedure given on page 9.
- 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.
- Confirm in the catalog that sensors and actuators are applicable before using them.
- Always turn OFF the power supply before connecting or disconnecting connectors.
- Do not touch the mating surface of the connectors with wet hands.
- Wipe away any water around the connectors.
- Do not allow metal scraps or dust to enter the mating section.

Cable Lead Polarity

- Connect the cables leads using the correct polarity (Blue: Negative power supply, Brown: Positive power supply).
- If the polarity is not correct, the load may not operate or the operation indicator may not light.
- Always connect a load to the signal lines to operate a sensor or actuator.

Applicable Connectors

- Always mount a Waterproof Cover (XS2Z-22) or Dust Cover (XS2Z-15) to any unused connector on the Connector Terminal Box.

Power Supply and Operation Indicators

- The power supply indicator will be lit green while power is being supplied. The operation indicator will be lit red while the sensor or actuator is operating.
- The XW3D is for a DC sensor or actuator. Do not use it for an AC sensor or actuator.
- Connector Terminal Boxes are available with either 2-wire or 3-wire internal connections, as indicated on the case.



XS5 Smartclick™ Compatible Products

Photoelectric Sensors

E3ZM-C: Oil-resistant, Robust, Compact Photoelectric Sensor (Stainless Housing and Built-in Amplifier)

Orange light Red light Infrared light

Sensing method	Appearance	Sensing distance	Model	
			NPN output	PNP output
Through-beam		15 m	E3ZM-CT61-M1TJ	E3ZM-CT81-M1TJ
		20 m	E3ZM-CT62B-M1TJ	E3ZM-CT82B-M1TJ
Retro-reflective		4 m [100 mm] * (Using E39-R1S)	E3ZM-CR61-M1TJ	E3ZM-CR81-M1TJ
Diffuse reflective		1 m	E3ZM-CD62-M1TJ	E3ZM-CD82-M1TJ
BGS reflective		10 to 100 mm	E3ZM-CL61H-M1TJ	E3ZM-CL81H-M1TJ
		10 to 150 mm	E3ZM-CL62H-M1TJ	E3ZM-CL82H-M1TJ
		10 to 200 mm	E3ZM-CL64H-M1TJ	E3ZM-CL84H-M1TJ

*Separate the Sensor and Reflector by at least the distance given in parentheses.

E3Z: Compact Photoelectric Sensor (Built-in Amplifier)


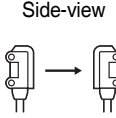

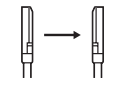

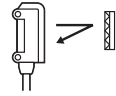

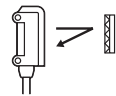

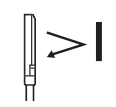

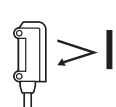

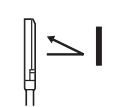
Sensing method	Appearance	Sensing distance	Model	
			NPN output	PNP output
Through-beam		15 m	E3Z-T61-M1TJ	E3Z-T81-M1TJ
Retro-reflective with MSR function		4 m *2 [100 mm]	E3Z-R61-M1TJ	E3Z-R81-M1TJ
Diffuse reflective		5 to 100 mm (wide view)	—	E3Z-D81-M1TJ
		1 m	E3Z-D62-M1TJ	E3Z-D82-M1TJ
Narrow-beam Reflective		90 ± 30 mm	E3Z-L61-M1TJ	E3Z-L81-M1TJ

*1. The Reflector is sold separately. Select the Reflector model most suited to the application.

*2. The sensing distance specified is possible when the E39-R1S used. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.

E3T: "Mini" Photoelectric Sensor with Built-in Amplifier


■ Red light

Sensing method	Appearance		Sensing distance	Operating mode	Model	
					NPN output	PNP output
Through-beam			1 m	Light-ON	E3T-ST11-M1TJ	E3T-ST13-M1TJ
				Dark-ON	E3T-ST12-M1TJ	E3T-ST14-M1TJ
			300 mm	Light-ON	E3T-ST21-M1TJ	E3T-ST23-M1TJ
				Dark-ON	E3T-ST22-M1TJ	E3T-ST24-M1TJ
			500 mm	Light-ON	E3T-FT11-M1TJ	E3T-FT13-M1TJ
				Dark-ON	E3T-FT12-M1TJ	E3T-FT14-M1TJ
			300 mm	Light-ON	E3T-FT21-M1TJ	E3T-FT23-M1TJ
				Dark-ON	E3T-FT22-M1TJ	E3T-FT24-M1TJ
Retro-reflective			200 mm [10 mm] *	Light-ON	E3T-SR21-M1TJ	E3T-SR23-M1TJ
				Dark-ON	E3T-SR22-M1TJ	E3T-SR24-M1TJ
			100 mm [10 mm] *	Light-ON	E3T-SR31-M1TJ	E3T-SR33-M1TJ
				Dark-ON	E3T-SR32-M1TJ	E3T-SR34-M1TJ
Diffuse reflective			5 to 30 mm	Light-ON	E3T-FD11-M1TJ	E3T-FD13-M1TJ
				Dark-ON	E3T-FD12-M1TJ	E3T-FD14-M1TJ
Convergent reflective			5 to 15 mm	Light-ON	E3T-SL11-M1TJ	E3T-SL13-M1TJ
				Dark-ON	E3T-SL12-M1TJ	E3T-SL14-M1TJ
			5 to 30 mm	Light-ON	E3T-SL21-M1TJ	E3T-SL23-M1TJ
				Dark-ON	E3T-SL22-M1TJ	E3T-SL24-M1TJ
BGS reflective			1 to 15 mm	Light-ON	E3T-FL11-M1TJ	E3T-FL13-M1TJ
				Dark-ON	E3T-FL12-M1TJ	E3T-FL14-M1TJ
			1 to 30 mm	Light-ON	E3T-FL21-M1TJ	E3T-FL23-M1TJ
				Dark-ON	E3T-FL22-M1TJ	E3T-FL24-M1TJ

*Separate the Sensor and Reflector by at least the distance given in parentheses.



Proximity Sensors

Proximity Sensors with Oil-resistant Cables (PUR Cables)

Appearance	Sensing distance		Output configuration	Operating mode	Model
 Shielded	M8	2 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2E-X2D1-M1TGJ-U
	M12	3 mm			E2E-X3D1-M1TGJ-U
	M18	7 mm			E2E-X7D1-M1TGJ-U
	M30	10 mm			E2E-X10D1-M1TGJ-U
	M8	2 mm	2-wire DC with polarity Uses pins 1 and 2	NC	E2E-X2D2-M1TGJ-U
	M12	3 mm			E2E-X3D2-M1TGJ-U
	M18	7 mm			E2E-X7D2-M1TGJ-U
	M30	10 mm			E2E-X10D2-M1TGJ-U


Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

Standard Proximity Sensor (PVC Cable)

Appearance	Sensing distance		Output configuration	Operating mode	Model
 Shielded	M8	2 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2E-X2D1-M1TGJ
	M12	3 mm			E2E-X3D1-M1TGJ
	M18	7 mm			E2E-X7D1-M1TGJ
	M30	10 mm			E2E-X10D1-M1TGJ
 Non-shielded	M12	8 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2E-X8MD1-M1TGJ
	M18	14 mm			E2E-X14MD1-M1TGJ
	M30	20 mm			E2E-X20MD1-M1TGJ


Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

Spatter-Immune Proximity Sensor (Fire-retardant PVC Cable)

Appearance	Sensing distance		Output configuration	Operating mode	Model
 Shielded	M12	3 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2EQ-X3D1-M1TGJ
	M18	7 mm			E2EQ-X7D1-M1TGJ
	M30	10 mm			E2EQ-X10D1-M1TGJ
	M12	4 mm	2-wire DC with polarity Uses pins 3 and 4	NO	E2EQ-X4X1-M1TJ
	M18	8 mm			E2EQ-X8X1-M1TJ
	M30	15 mm			E2EQ-X15X1-M1TJ


Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

Proximity Sensor with All-stainless Housing (Fire-retardant PVC Cable)

Appearance	Sensing distance		Output configuration	Operating mode	Model
 Shielded	M8	1.5 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2FM-X1R5D1-M1TGJ
	M12	2 mm			E2FM-X2D1-M1TGJ
	M18	5 mm			E2FM-X5D1-M1TGJ
	M30	10 mm			E2FM-X10D1-M1TGJ


Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

Chip-Immune Inductive Proximity Sensor (PVC Cable)

Appearance	Sensing distance	Output configuration	Operating mode	Model
 Shielded	M12 2 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2EZ-X2D1-M1TGJ
	M18 4 mm			E2EZ-X4D1-M1TGJ
	M30 8 mm			E2EZ-X8D1-M1TGJ
	M12 2 mm	2-wire DC with polarity Uses pins 3 and 4	NO	E2EZ-X2D1-M1TJ
	M18 4 mm			E2EZ-X4D1-M1TJ
	M30 8 mm			E2EZ-X8D1-M1TJ


Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

Proximity Sensors with Pulse Response

Appearance	Sensing distance	Output configuration	Operating mode	Model
 Shielded	M12 4 mm	3-wire DC with PNP output Uses pins 1, 4, and 3	NO	E2V-X4B1-M1TJ
	M18 8 mm			E2V-X8B1-M1TJ
	M30 15 mm			E2V-X15B1-M1TJ
	M12 4 mm	3-wire DC with NPN output Uses pins 1, 4, and 3	NO	E2V-X4C1-M1TJ
	M18 8 mm			E2V-X8C1-M1TJ
	M30 15 mm			E2V-X15C1-M1TJ

Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

Cable Amplifier Proximity Sensor

Appearance	Sensing distance	Output configuration	Operating mode	Model
 Shielded	3 dia. 0.8 mm	2-wire DC with polarity Uses pins 1 and 4	NO	E2EC-CR8D1-M1TGJ
	5.4 dia. 1.5 mm			E2EC-C1R5D1-M1TGJ
	8 dia. 3 mm			E2EC-C3D1-M1TGJ
	8 dia. 2 mm	2-wire DC without polarity Uses pins 3 and 4	NO	E2EC-QC2D1-M1TGJ-T

Note: Other models are also available that can be used with the Twist-and-Click Connectors. Ask your OMRON representative for details.

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 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 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 description 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.
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VI. MISCELLANEOUS

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Complete "Terms and Conditions of Sale" for product purchase and use are on Omron's website at <http://www.components.omron.com> – under the "About Us" tab, in the Legal Matters section.

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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