

Smartclick Oil-resistant Connectors with Improved Oil Resistance

- Fluororesin cable withstands cutting oil
- Structured provides greater oil resistance
- Newly developed locking mechanism is compatible with round M12 connectors
- IP67G degree of protection (JIS C 0920 Annex 1)*



Refer to *Safety Precautions* on page 45.

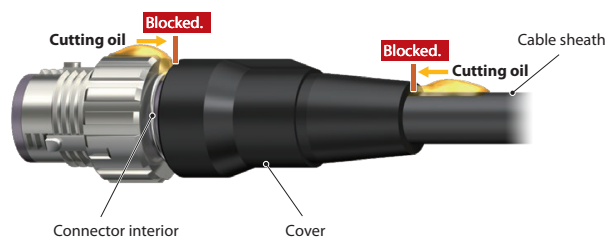
* The IP67G is the degree of protection defined according to JIS (Japanese Industrial Standards). The IP67 indicates the same level of protection as defined by IEC, and the G indicates that a device has resistance to oil.

Features

Fluororesin Cable and Structure Increase Oil Resistance

Fluororesin, which suppresses deterioration by either water-insoluble or water-soluble cutting oils, is used for the cable sheath. Ingress from at the joined surfaces is prevented by the unique OMRON technology that combines forming and sealing methods with surface bonding techniques. Ingress between Connectors is prevented by the unique Smartclick mechanism.

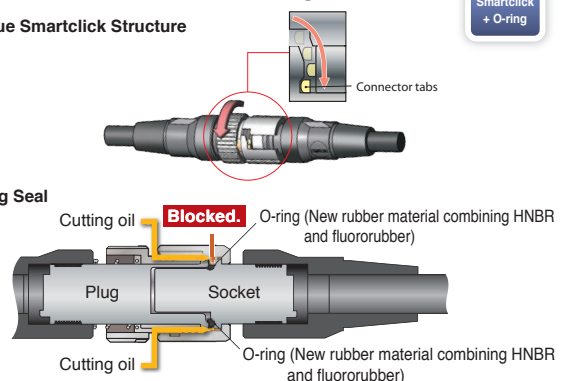
Forming and Sealing Method + Surface Bonding Technique



Smartclick Structure + O-ring

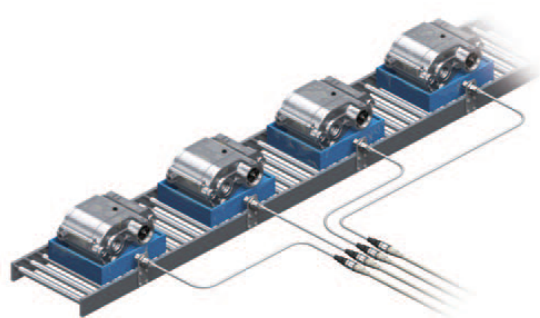
Unique Smartclick Structure

O-ring Seal



Application

Replacement of Sensors and Wiring

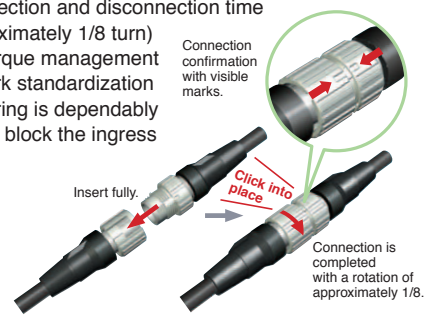


Benefits of Using Connectors:

- Less wiring in comparison with connecting discrete wires to terminal blocks
- No wiring mistakes

Additional Benefits of Using Smartclick Connectors:

- Reduced connection and disconnection time (1 click, approximately 1/8 turn)
- No need for torque management to facilitate work standardization
- The built-in O-ring is dependably compressed to block the ingress of cutting oil



Ratings and Specifications

Rated current	1 A
Rated voltage	30 VDC
Contact resistance (connector)	40 mΩ max. (20 mV max., 100 mA max.)
Insulation resistance	1,000 MΩ min. (at 500 VDC) *1
Dielectric strength (connector)	1,500 VAC for 1 min (leakage current: 1 mA max.)
Degree of protection	IP67 (IEC 60529) and IP67G (JIS C 0920 Annex 1) *2 Passed OMRON's Oil-resistant Component Evaluation Standards*3 (Cutting oil type: specified in JIS K 2241:2000; Temperature: 35°C max.)
Insertion tolerance	50 times min.
Lock strength	Tensile: 100 N/15 s, Torsion: 1 N·m/15 s
Cable holding strength	Tensile: 100 N/15 s
Ambient operating temperature range/ Ambient storage temperature range	-25 to +70°C
Ambient humidity range	20% to 85%

*1. This value represents the condition when the Connector is shipped from the factory.

*2. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).

The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

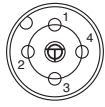

*3. The Oil-resistant Component Evaluation Standards are OMRON's own durability evaluation standards.

The Pre-wired Connector type meets the degree of protection when it is correctly connected with an XS5□R Oil-resistant Connector.
The degree of protection is not satisfied with the part where there is no XS5FR Oil-resistant Connector connected and cable wires are uncovered.

Materials and Finishes

Contacts	Material	Phosphor bronze
	Finish	Nickel base, 0.4-μm gold plating
Fixtures		Nickel-plated zinc alloy
Fixtures (Lock)		Stainless steel
Pin block		PA resin (UL 94 HB)
O-ring		New rubber material combining HNBR and fluororubber
Cover		PA resin (UL 94 HB)
Cable		Cable with fluororesin sheath: 4-mm dia. Core wire: 0.2mm ²

Connector Pinout Diagram (from Mating Side)

Item	No. of poles	4 poles
A-coding (For DC sensor)	Male (plug) contacts	
	Female (socket) contacts	

XS5FR Connector Connected to Cable, Socket on One Cable End

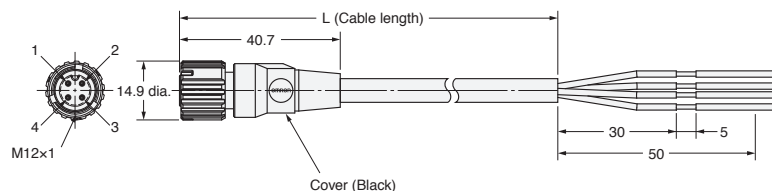
● Cable with fluororesin sheath

XS5FR-D423-□80-RB1

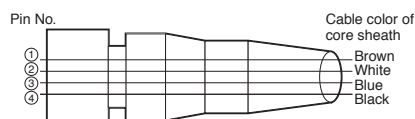
Dimensions

(Unit: mm)

Straight



Wiring Diagram for 4 Cores



Model Number Legend

XS5FR- 1 2 3 4 5 - 6 7 8 - RB1

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

1. Type

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

2. Mating Section Form

D: A-coding (For DC sensor)

3. Connector Poles

4: 4 poles

4. Contact Plating

2: 0.4- μ m gold plating

5. Cable Connection Direction, Cable Outer Diameter

3: Straight, 4-mm dia.

6. Cable Length

D: 2 m G: 5 m J: 10 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

Ordering Information

Type	Cable outer diameter (mm)	No. of conductors	Cable length (m)	Model
Socket on One Cable End	4 dia.	4	2	XS5FR-D423-D80-RB1
			5	XS5FR-D423-G80-RB1
			10	XS5FR-D423-J80-RB1

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XS5WR

Connectors Connected to Cable, Socket and Plug on Cable Ends

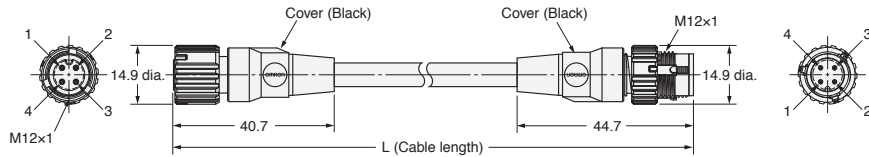
● Cable with fluororesin sheath

XS5WR-D425-□81-RB1

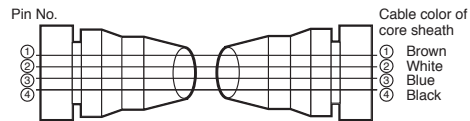
Dimensions

(Unit: mm)

Straight/straight



Wiring Diagram for 4 Cores



Model Number Legend

XS5WR- D 4 2 5 - □ 8 1 -RB1

1 2 3 4 5 6 7 8

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

1. Type

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

2. Mating Section Form

D: A-coding (For DC sensor)

3. Connector Poles

4: 4 poles

4. Contact Plating

2: 0.4- μ m gold plating

5. Cable Connection Direction, Cable Outer Diameter

5: Straight/straight, 4-mm dia.

6. Cable Length

D: 2 m G: 5 m J: 10 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

Ordering Information

Type	Cable outer diameter (mm)	No. of conductors	Cable length (m)	Model
Socket and Plug on Cable Ends	4 dia.	4	2	XS5WR-D425-D81-RB1
			5	XS5WR-D425-G81-RB1
			10	XS5WR-D425-J81-RB1

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Safety Precautions

Warning Indications

Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

Precautions for Safe Use

Protective structure

- Do not use the product with degrade protective structure such as swelling and crack in housing and/or sealing components. Otherwise cutting oil or other substance may enter the product, resulting in a risk of corruption or burning.

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. Check the direction of the key groove before you use the Connector.
- Do not wiring the Connector when your hands are wet. Malfunctions or device damage may occur when power is supplied to a device.
- When mating Connectors, be sure to insert the plug all the way to the back of the socket before attempting to lock the Connectors. After you lock a Connector, always confirm that it is mated properly.
- Do not use tools of any sort to mate the Connectors. Always use your hands. Pliers or other tools may damage the Connectors.
- When you replace a Connector, make sure that there is no liquid, cutting oil, or other foreign matter on the mating surfaces before you mate the Connector.

Precautions for Correct Use

- Do not use the Connectors in an atmosphere or environment that exceeds the specifications.
- Always turn OFF the power supply before wiring the Connector. Electric shock or device damage may result.
- The following conditions shall be observed if you use the product under an environment using cutting oil that may affect product's life and/or performance.
 - Usage under the cutting oil condition designated by the specification
 - Usage under the cutting oil dilution ratio recommended by its manufacturer
 - Usage in oil or water is prohibited

Impact on the product life may differ depending on the oil you use. Before using the cutting oil, make sure that it should not cause deterioration or degradation of sealing components.

- The XS5□R can be used in conditions of cutting oil use described in the specifications. The oil resistance may not be ensured when the products are not mated to OMRON Oil-resistant Components or XS5□R Connectors, so use the products correctly.
- Do not use a Connector in a location subject to corrosive gas, high humidity, or high temperatures. Contact failure or corrosion may damage the Connector and interfere with functionality.
- Do not pull excessively on the Connectors or cables.
- Install the Connectors and cables where they will not be stepped on to prevent the wires inside the cables from being broken and to prevent the Connectors from being damaged. If the Connectors or cables must be installed where they might be stepped on, protect them with covers.
- If a sensor or switch is not connected during installation or if the plug connector is not mated, use a XS5Z-11 or XS2Z-11 Waterproof Cover or XS2Z-14/15 Dust Cover to protect the mating surface of the Connector.

Wiring

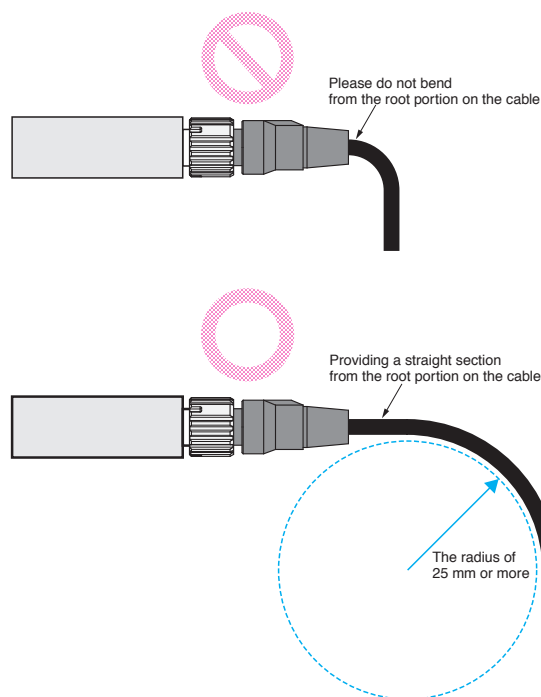
- Do not wire the ends of the cable in any location that is subject to water, cutting oils, or other liquids.
- Wire the cable according to the wiring diagram. Before you use a sensor or limit switch, confirm that connection is possible.
- Lay the cables so that external force is not applied to the Connectors. Otherwise, the degree of protection (IP67G) may not be achieved.

Degree of Protection (IP67)

- 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.

Setup

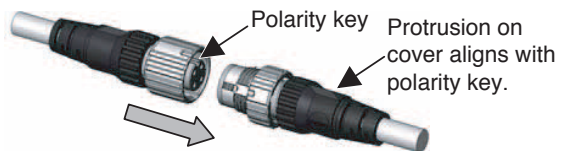
- Do not install the Connectors or cables in any way that would place a load directly on the mating section or cable connections. Doing so can damage the Connectors or break the wires inside the cables.
- Do not bend the cable to a radius that is smaller than 25 mm.



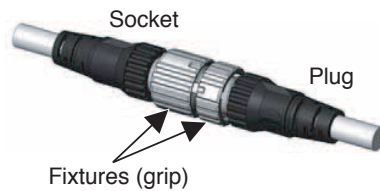
Connecting

1. Connecting the XS5□R Plug and Socket

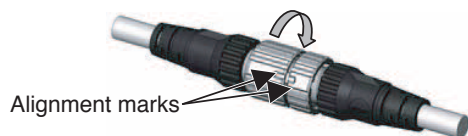
- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.



- 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 1/8 turn 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 XS5□R 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.
- When mating the products to XS2 or other M12 Connectors, tighten the lock to a torque of 0.39 to 0.49 N·m.

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