XS2

CSM_XS2_DS_E_3_2

Water- and Environment-resistive FA Connectors Save Wiring and Maintenance Effort

- Compact FA connectors satisfy IP67 requirements and ensure a 94V-0 fire retardant rating.
- A wide array of connectors makes a wiring system more modular, simplifies maintenance, and reduces downtime.
- Connectors with Cables and Connector Assemblies are available.
- Three types of Connector Assembly: Crimping, soldering, and screw-on.

⚠ Refer to *Safety Precautions* on page 29.

Ratings and Specifications

Item / Model	4,5 Poles	8 Poles
Rated current	4 A	1.5 A
Rated voltage	125 VDC, 250 VAC	36 VDC
Contact resistance	40 mΩ max. (20 mV max., 100 mA max.)	
Insulation resistance	1,000 MΩ min. (at 500 VDC)	
Dielectric strength (leakage current: 1 mA max.)	1,500 VAC for 1 min	1,000 VAC for 1 min
Degree of protection	IP67 (IEC60529)	
Insertion tolerance	200 times min.	

Material

Contact / Surface	Copper Alloy / Nickel base, Au0.4 µm
Connector housing	PBT resin (UL94V-0)
Nut / Surface	Copper Alloy / Nickel plated
Cover (XS2F/H/W/R)	PBT resin (UL94V-0)
Body (XS2C/G)	PBT resin (UL94V-0)

PVC Cable

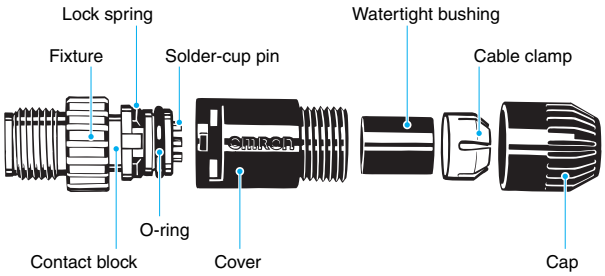
Item / Model	3 cores	4 cores	5 cores	8 cores
Color	Black			Light Grey
Outer diameter	5 mm dia.	5.4 mm dia.	5.8 mm dia.	6 mm dia.
Conductor size	AWG22 0.34 mm²(43 × 0.1)			0.25 mm² (20 × 0.127)
Approvals	AWM			—
Features	Flame retardant			—
Temperature range	Cable fixed: -10 to +80°C / Cable moved: -0 to +60°C			-25°C to +70°C

PUR Cable

Item / Model	3 cores	4 cores	5 cores
Color	Black		
Outer diameter	4.3 mm dia.	4.7 mm dia.	5 mm dia.
Conductor size	AWG22 0.34 mm² (43 × 0.1)		
Approvals	AWM		
Features	Flame retardant Halogen free Oil resistance		
Temperature range	Cable fixed: -50 to +80°C / Cable moved: -25 to +80°C		

Construction

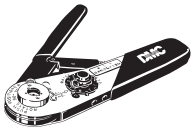
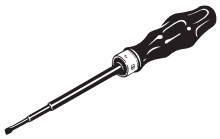
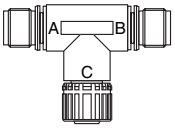
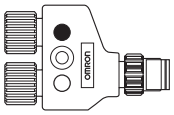
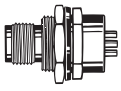
(XS2G Soldering Plug Connector Assembly)



PVC Cable (For IP69K)

Item / Model	Standard	Heat-resistant
Color	Light Grey	Black
Outer diameter	6 mm dia.	
Conductor size	AWG20 0.5 mm² (49 × 0.12)	AWG20 0.5 mm² (45 × 0.12)
Approvals	AWM	—
Features	Flame retardant	Heat and chemical resistant
Temperature range	-25 to +70°C	-25 to +105°C

List of Products

Name	Model		Appearance
1. Connectors attached to Cable	XS2W Sockets and Plugs on Cable Ends		
	XS2F Sockets on One Cable End		
	XS2H Plugs on One Cable End		
2. Connector Assemblies (Crimping, Soldering, or Screw-on) **Used to enable using connectors for sensor cables and relay cables.**	XS2G Plug Assemblies		
	XS2C Socket Assemblies		
	XY2F Crimp Tool (for Crimping Connectors)		
	XW4Z Screwdriver (for Screw-on Connectors)		
3. Terminal Box Connectors **Used to enable using connectors for terminal boxes.**	XS2P Panel-mounting Sockets		
4. T-Joints and Y-Joints **Used for branching and for daisy-chain connections.**	XS2R T-Joint/Y-Joint Plug/Socket Connectors	T-Joints	
		Y-Joints	
5. Sensor Connector Assemblies **Used to enable using connectors in sensors.**	XS2M Plugs	Embedded Plugs with Screw Threads	
		Embedded Plugs with No Screw Threads	
6. Panel-mounting Connectors **Used to enable using I/O box connectors mounted to panels.**	XS2M Plugs	Flange-mounting Plugs	
		Screw-mounting Plugs	

XS2F Sockets on One Cable End

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*.

XS2F-M 12 □□□ □ □ □□M

1 2 3 4 5

(PENDING)

1. Screw Size
M12: M12 size

2. Cable
PVC: PVC cable
PUR: PUR cable

3. Number of Cores
3: 3 cores
4: 4 cores
5: 5 cores

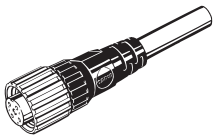
4. Shape
A: Angled
S: Straight

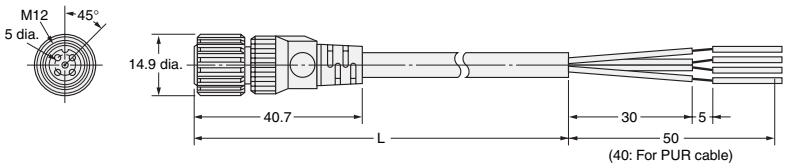
5. Cable Length
2M: 2 m
5M: 5 m
10M: 10 m

Dimensions

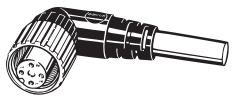
(Unit: mm)

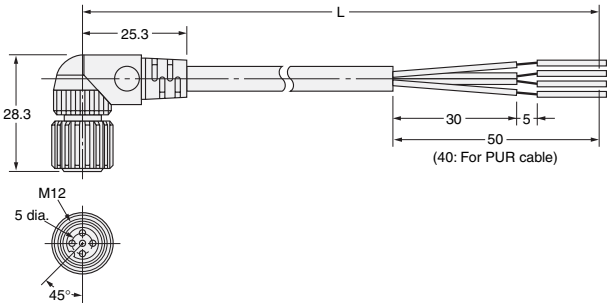
Straight



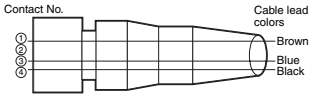
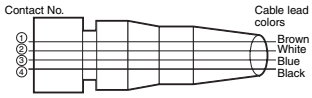
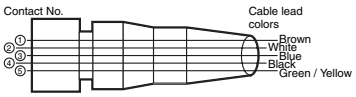


Angled





Wiring Diagram

3 cores	4 cores	5 cores
		

Ordering Information

Connector	Size	Cable material	Cores	Shape	Length (m)	Product description
Socket	M12	PVC	3	Angled	2	**XS2F-M12PVC3A2M**
					5	**XS2F-M12PVC3A5M**
					10	**XS2F-M12PVC3A10M**
				Straight	2	**XS2F-M12PVC3S2M**
					5	**XS2F-M12PVC3S5M**
					10	**XS2F-M12PVC3S10M**
			4	Angled	2	**XS2F-M12PVC4A2M**
					5	**XS2F-M12PVC4A5M**
					10	**XS2F-M12PVC4A10M**
				Straight	2	**XS2F-M12PVC4S2M**
					5	**XS2F-M12PVC4S5M**
					10	**XS2F-M12PVC4S10M**
			5	Angled	2	**XS2F-M12PVC5A2M**
					5	**XS2F-M12PVC5A5M**
				Straight	2	**XS2F-M12PVC5S2M**
					5	**XS2F-M12PVC5S5M**
		PUR	3	Angled	2	**XS2F-M12PUR3A2M**
					5	**XS2F-M12PUR3A5M**
					10	**XS2F-M12PUR3A10M**
				Straight	2	**XS2F-M12PUR3S2M**
					5	**XS2F-M12PUR3S5M**
					10	**XS2F-M12PUR3S10M**
			4	Angled	2	**XS2F-M12PUR4A2M**
					5	**XS2F-M12PUR4A5M**
					10	**XS2F-M12PUR4A10M**
				Straight	2	**XS2F-M12PUR4S2M**
					5	**XS2F-M12PUR4S5M**
					10	**XS2F-M12PUR4S10M**
			5	Angled	2	**XS2F-M12PUR5A2M**
					5	**XS2F-M12PUR5A5M**
				Straight	2	**XS2F-M12PUR5S2M**
					5	**XS2F-M12PUR5S5M**

XS2F Sockets on One Cable End with LED

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*.

XS2F-M 12 □□□ □ A □□M LED

1 2 3 4 5 6

1. Screw Size
M12: M12 size

2. Cable
PVC: PVC cable
PUR: PUR cable

3. Number of Cores
3: 3 cores
4: 4 cores

4. Shape
A: Angled

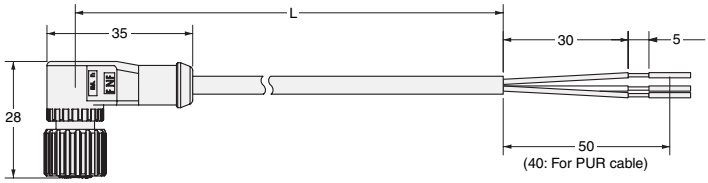
5. Cable Length
2M: 2 m
5M: 5 m
10M: 10 m

6. LED
LED: with LED

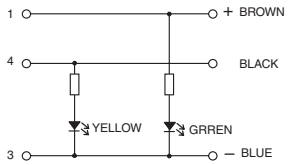
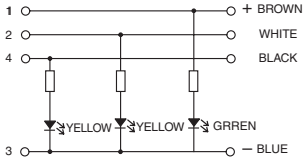
Dimensions

(Unit: mm)

Angled



Wiring Diagram

3 cores	4 cores
	

Ordering Information

Connector	Size	Cable material	Cores	Shape	Length (m)	Product description	LED
Socket	M12	PVC	3	Angled	2	**XS2F-M12PVC3A2MLED**	Yes
					5	**XS2F-M12PVC3A5MLED**	
					10	**XS2F-M12PVC3A10MLED**	
			4		2	**XS2F-M12PVC4A2MLED**	
					5	**XS2F-M12PVC4A5MLED**	
					10	**XS2F-M12PVC4A10MLED**	
		PUR	3		2	**XS2F-M12PUR3A2MLED**	
					5	**XS2F-M12PUR3A5MLED**	
					10	**XS2F-M12PUR3A10MLED**	
			4		2	**XS2F-M12PUR4A2MLED**	
					5	**XS2F-M12PUR4A5MLED**	
					10	**XS2F-M12PUR4A10MLED**	

XS2F Sockets on One Cable End IP69K

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*.

XS2F-E42□-□80-□
1 2 3 4 5 6 7 8 9

c UL us (PENDING)

1. Type
XS2F: Connector connected to cable, socket on one cable end

2. Nut Material
E: Stainless

3. Connector Poles
4: 4 poles

4. Contact Plating
2: 0.4-um gold plating

5. Cable Connection Direction
1: Straight
2: Angled

6. Cable Length
D: 2 m
G: 5m
J: 10 m

7. Connections
8: Brown White Blue Black

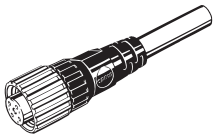
8. Connectors on One End / Both Ends
0: One End

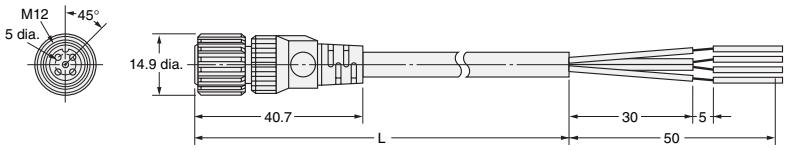
9. Cable Specifications
A: Standard cable
E: Heat-resistant cable

Dimensions

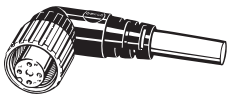
(Unit: mm)

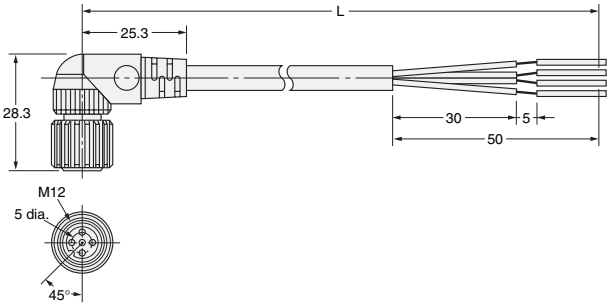
Straight





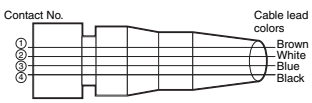
Angled





Wiring Diagram

4 cores



Ordering Information

Connector	Size	Cable material	Cores	Shape	Length (m)	Product description
Female	M12	Standard	4	Angled	2	**XS2F-E422-D80-A**
					5	**XS2F-E422-G80-A**
					10	**XS2F-E422-J80-A**
				Straight	2	**XS2F-E421-D80-A**
					5	**XS2F-E421-G80-A**
					10	**XS2F-E421-J80-A**
		Heat-resistant	4	Angled	2	**XS2F-E422-D80-E**
					5	**XS2F-E422-G80-E**
					10	**XS2F-E422-J80-E**
				Straight	2	**XS2F-E421-D80-E**
					5	**XS2F-E421-G80-E**
					10	**XS2F-E421-J80-E**

XS2H Plugs on one cable end

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*.

XS2H-M 12 □□□ □ S □□M

1 2 3 4 5

(PENDING)

1. Screw Size
M12: M12 size

2. Cable
PVC: PVC cable
PUR: PUR cable

3. Number of Cores
3: 3 cores
4: 4 cores
5: 5 cores

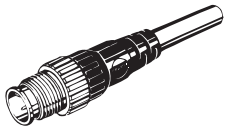
4. Shape
S: Straight

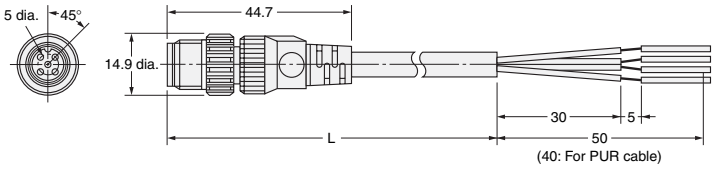
5. Cable Length
2M: 2 m
5M: 5 m
10M: 10 m

Dimensions

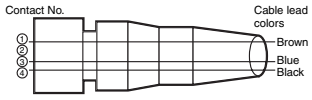
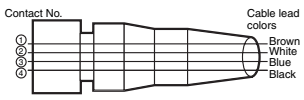
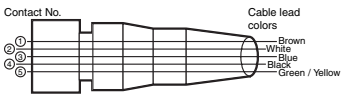
(Unit: mm)

Straight





Wiring Diagram

3 cores	4 cores	5 cores
		

Ordering Information

Connector	Size	Cable material	Cores	Shape	Length (m)	Product description
Plug	M12	PVC	3	Straight	1	**XS2H-M12PVC3S1M**
					2	**XS2H-M12PVC3S2M**
					5	**XS2H-M12PVC3S5M**
					10	**XS2H-M12PVC3S10M**
			4		1	**XS2H-M12PVC4S1M**
					2	**XS2H-M12PVC4S2M**
					5	**XS2H-M12PVC4S5M**
					10	**XS2H-M12PVC4S10M**
			5		1	**XS2H-M12PVC5S1M**
					2	**XS2H-M12PVC5S2M**
					5	**XS2H-M12PVC5S5M**
		PUR	3		1	**XS2H-M12PUR3S1M**
					2	**XS2H-M12PUR3S2M**
					5	**XS2H-M12PUR3S5M**
					10	**XS2H-M12PUR3S10M**
			4		1	**XS2H-M12PUR4S1M**
					2	**XS2H-M12PUR4S2M**
					5	**XS2H-M12PUR4S5M**
					10	**XS2H-M12PUR4S10M**
			5		1	**XS2H-M12PUR5S1M**
					2	**XS2H-M12PUR5S2M**
					5	**XS2H-M12PUR5S5M**

XS2W Sockets and Plugs on Cable Ends

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*.

XS2W-M 12 □□□ □ SS □□M

1 2 3 4 5

(PENDING)

1. Screw Size
M12: M12 size

2. Cable
PVC: PVC cable
PUR: PUR cable

3. Number of Cores
4: 4 cores
5: 5 cores

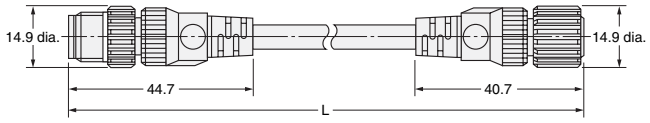
4. Shape
SS: Straight / Straight

5. Cable Length
2M: 2 m
5M: 5 m
10M: 10 m

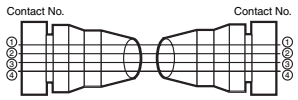
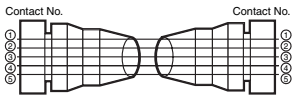
Dimensions

(Unit: mm)

Straight/Straight



Wiring Diagram

4 cores	5 cores
	

Ordering Information

Connector	Size	Cablematerial	Cores	Shape		Length (m)	Product description
				Plug	Socket		
Both	M12	PVC	4	Straight	Straight	2	**XS2W-M12PVC4SS2M**
						5	**XS2W-M12PVC4SS5M**
						10	**XS2W-M12PVC4SS10M**
			5			2	**XS2W-M12PVC5SS2M**
						5	**XS2W-M12PVC5SS5M**
						10	**XS2W-M12PVC5SS10M**
		PUR	4			2	**XS2W-M12PUR4SS2M**
						5	**XS2W-M12PUR4SS5M**
						10	**XS2W-M12PUR4SS10M**
			5			2	**XS2W-M12PUR5SS2M**
						5	**XS2W-M12PUR5SS5M**
						10	**XS2W-M12PUR5SS10M**

XS2C Crimping/Soldering Socket Assemblies

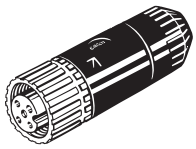
(PENDING)

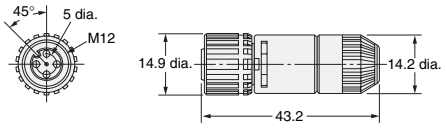
Dimensions

(Unit: mm)

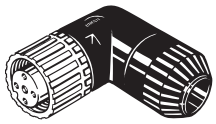
XS2C-□4C□ (Crimping Model)
XS2C-□42□ (Soldering Model)

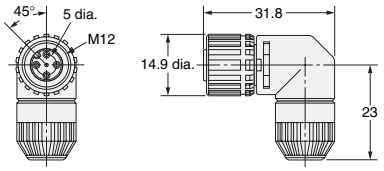
Straight





Angled





Ordering Information

Suitable cable dia. (mm)	Cable connection direction	Connection method	Model	Minimum order
6-mm-dia. model (5 to 6 mm dia.)	Straight	Crimping	**XS2C-D4C1**	50
		Soldering	**XS2C-D421**	
	Angled	Crimping	**XS2C-D4C2**	
		Soldering	**XS2C-D422**	
4-mm-dia. model (4 to 5 mm dia.)	Straight	Crimping	**XS2C-D4C3**	
		Soldering	**XS2C-D423**	
	Angled	Crimping	**XS2C-D4C4**	
		Soldering	**XS2C-D424**	
3-mm-dia. model (3 to 4 mm dia.)	Straight	Crimping	**XS2C-D4C5**	
		Soldering	**XS2C-D425**	
	Angled	Crimping	**XS2C-D4C6**	
		Soldering	**XS2C-D426**	

Note: Crimping plug contacts are sold separately.

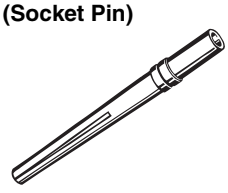
XS2U Crimping Pin for XS2C

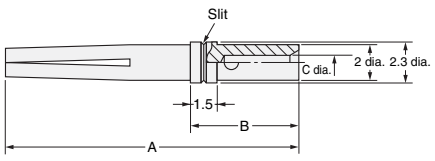
Dimensions

(Unit: mm)

XS2U-222□ (Socket Pin)

Note: A special tool must be used for crimping. For details, refer to page 26.





Dimensions

Model	Suitable core size (mm^2)	Dimension (mm)			No. of slits
		A	B	C	
XS2U-2221	0.18 to 0.3	16.7	6.1	0.8	1
XS2U-2222	0.5 to 0.75	16.8	6.2	1.3	0

Ordering Information

Suitable core size (mm^2)	Model	Minimum order
0.18 to 0.3	**XS2U-2221**	100
0.5 to 0.75	**XS2U-2222**	

Note: Orders are accepted in multiples of the minimum order.

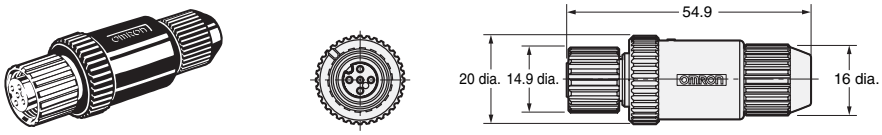
XS2C Screw-on Socket Assemblies

(PENDING)

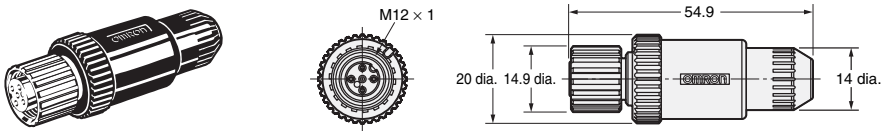
Dimensions

(Unit: mm)

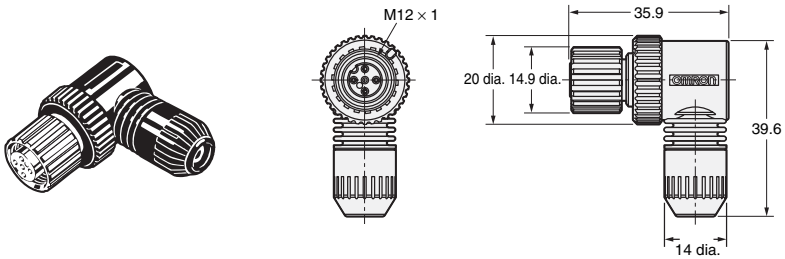
XS2C-D5S7 (5-core, Straight, Applicable Cable Outer Diameter: 8 mm)
XS2C-D5S9 (5-core, Straight, Applicable Cable Outer Diameter: 7 mm)
XS2C-D4S7 (4-core, Straight, Applicable Cable Outer Diameter: 8 mm)
XS2C-D4S9 (4-core, Straight, Applicable Cable Outer Diameter: 7 mm)



XS2C-D5S1 (5-core, Straight, Applicable Cable Outer Diameter: 6 mm)
XS2C-D4S□ (4-core, Straight, Applicable Cable Outer Diameter: 3, 4, or 6 mm)



XS2C-D5S2 (5-core, Angled, Applicable Cable Outer Diameter: 6 mm)
XS2C-D4S□ (4-core, Angled, Applicable Cable Outer Diameter: 3, 4, or 6 mm)



Ordering Information

No. of poles	Suitable cable dia. (mm)	Straight connectors	Angled connectors	Minimum order
		Model	Model	
5	8-mm-dia. model (7 to 8 mm dia.)	**XS2C-D5S7**	—	50
	7-mm-dia. model (6 to 7 mm dia.)	**XS2C-D5S9**	—	
	6-mm-dia. model (5 to 6 mm dia.)	**XS2C-D5S1**	**XS2C-D5S2**	
	4-mm-dia. model (4 to 5 mm dia.)	**XS2C-D5S3**	**XS2C-D5S4**	
	3-mm-dia. model (3 to 4 mm dia.)	**XS2C-D5S5**	**XS2C-D5S6**	
4	8-mm-dia. model (7 to 8 mm dia.)	**XS2C-D4S7**	—	
	7-mm-dia. model (6 to 7 mm dia.)	**XS2C-D4S9**	—	
	6-mm-dia. model (5 to 6 mm dia.)	**XS2C-D4S1**	**XS2C-D4S2**	
	4-mm-dia. model (4 to 5 mm dia.)	**XS2C-D4S3**	**XS2C-D4S4**	
	3-mm-dia. model (3 to 4 mm dia.)	**XS2C-D4S5**	**XS2C-D4S6**	

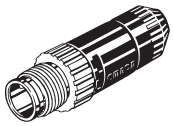
XS2G Crimping/Soldering Plug Assemblies

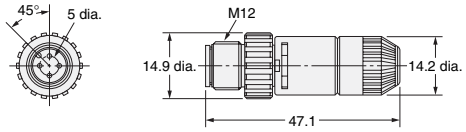
(PENDING)

Dimensions

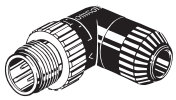
(Unit: mm)

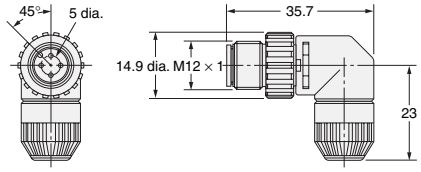
XS2G-□4C□ (Crimping Model)
XS2G-□42□ (Soldering Model)
Straight





XS2G-D42□ (Soldering Model)
Angled





Ordering Information

Suitable cable dia. (mm)	Cable connection direction	Connection method	Model	Minimum order
6-mm-dia. model (5 to 6 mm dia.)	Straight	Crimping	**XS2G-D4C1**	50
		Soldering	**XS2G-D421**	
	Angled	Soldering	**XS2G-D422**	
4-mm-dia. model (4 to 5 mm dia.)	Straight	Crimping	**XS2G-D4C3**	
		Soldering	**XS2G-D423**	
	Angled	Soldering	**XS2G-D424**	
3-mm-dia. model (3 to 4 mm dia.)	Straight	Crimping	**XS2G-D4C5**	
		Soldering	**XS2G-D425**	
	Angled	Soldering	**XS2G-D426**	

Note: Crimping plug contacts are sold separately.

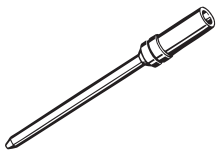
XS2U Crimping Pin for XS2G

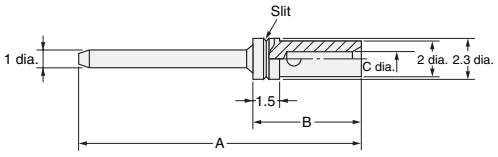
Dimensions

(Unit: mm)

XS2U-312□ (Plug Pin)

Note: A special tool must be used for crimping. For details, refer to page 26.





Dimensions

Model	Suitable core size (mm^2)	Dimension (mm)			No. of slits
		A	B	C	
XS2U-3121	0.18 to 0.3	20.0	6.1	0.8	1
XS2U-3122	0.5 to 0.75	20.1	6.2	1.3	0

Ordering Information

Suitable core size (mm^2)	Model	Minimum order
0.18 to 0.3	**XS2U-3121**	100
0.5 to 0.75	**XS2U-3122**	

Note: Orders are accepted in multiples of the minimum order.

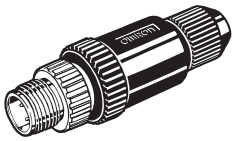
XS2G Screw-on Plug Assemblies

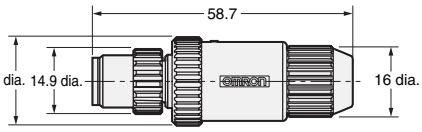
(PENDING)

Dimensions

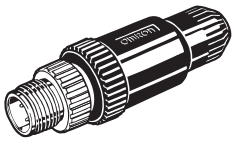
(Unit: mm)

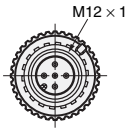
XS2G-D5S7 (5-core, Straight, Applicable Cable Outer Diameter: 8 mm)
XS2G-D5S9 (5-core, Straight, Applicable Cable Outer Diameter: 7 mm)
XS2G-D4S7 (4-core Straight, Applicable Cable Outer Diameter: 8 mm)
XS2G-D4S9 (4-core Straight, Applicable Cable Outer Diameter: 7 mm)

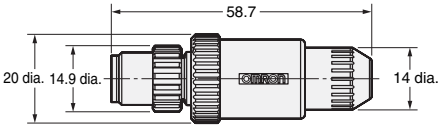




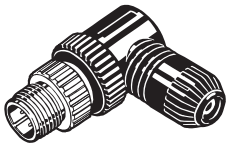
XS2G-D5S1 (5-core Straight, Applicable Cable Outer Diameter: 6 mm)
XS2G-D4S□ (4-core, Straight, Applicable Cable Outer Diameter: 3, 4, or 6 mm)

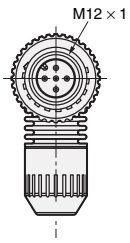


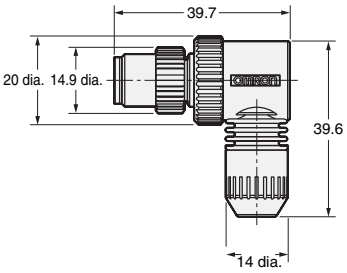




XS2G-D5S2 (5-core, Angled, Applicable Cable Outer Diameter: 6 mm)
XS2G-D4S□ (4-core, Angled, Applicable Cable Outer Diameter: 3, 4, or 6 mm)







Ordering Information

No. of poles	Suitable cable dia. (mm)	Straight connectors	Angled connectors	Minimum order
		Model	Model	
5	8-mm-dia. model (7 to 8 mm dia.)	**XS2G-D5S7**	—	50
	7-mm-dia. model (6 to 7 mm dia.)	**XS2G-D5S9**	—	
	6-mm-dia. model (5 to 6 mm dia.)	**XS2G-D5S1**	**XS2G-D5S2**	
	4-mm-dia. model (4 to 5 mm dia.)	**XS2G-D5S3**	**XS2G-D5S4**	
	3-mm-dia. model (3 to 4 mm dia.)	**XS2G-D5S5**	**XS2G-D5S6**	
4	8-mm-dia. model (7 to 8 mm dia.)	**XS2G-D4S7**	—	
	7-mm-dia. model (6 to 7 mm dia.)	**XS2G-D4S9**	—	
	6-mm-dia. model (5 to 6 mm dia.)	**XS2G-D4S1**	**XS2G-D4S2**	
	4-mm-dia. model (4 to 5 mm dia.)	**XS2G-D4S3**	**XS2G-D4S4**	
	3-mm-dia. model (3 to 4 mm dia.)	**XS2G-D4S5**	**XS2G-D4S6**	

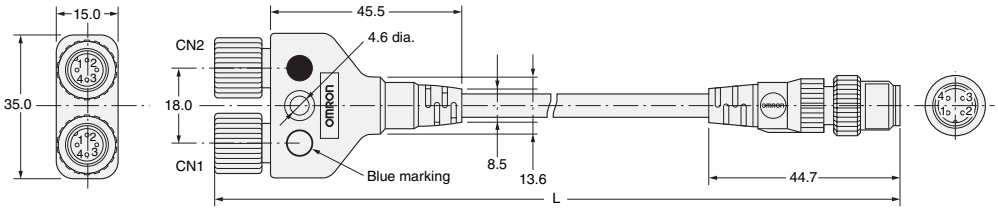
Note: XS2G Screw-on Plugs cannot be connected to side by side to the CN1 and CN2 connectors of XS2R Y-Joint Sockets/Plugs.

XS2R Y-Joint Plug/Socket Connectors

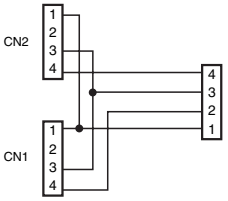
Dimensions

(Unit: mm)

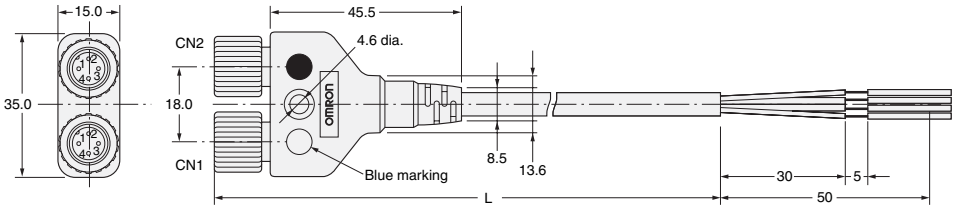
XS2R-D426-□11-F
Connectors on Both Cable Ends (Y-Joint Plug/Socket)



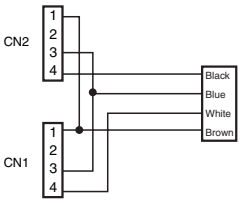
Wiring Diagram



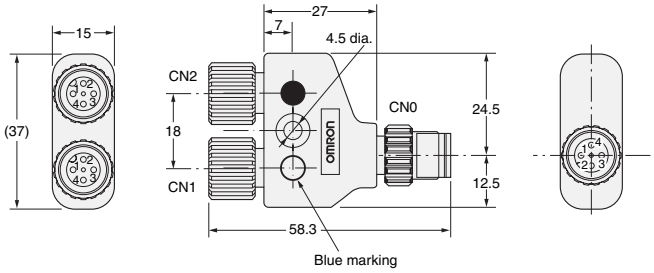
XS2R-D426-□10-F
Connectors on One Cable End (Y-Joint Plug/Socket)



Wiring Diagram

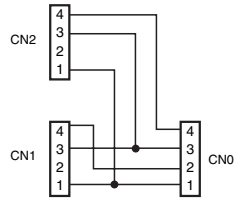


XS2R-D426-1
Y-Joint Plug/Socket without Cable

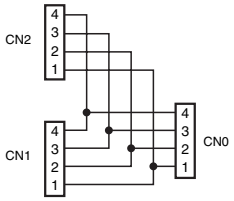


Wiring Diagram

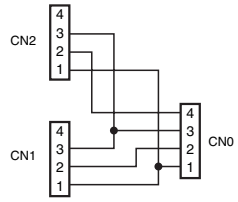
XS2R-D426-1



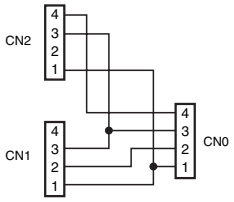
XS2R-D426-5



XS2R-D426-81



XS2R-D426-82



Ordering Information

Type	Connector	Cable length L (m)	Model	Minimum order
With cable	Connectors on both cable ends	0.5	**XS2R-D426-B11-F**	5
		1	**XS2R-D426-C11-F**	
		2	**XS2R-D426-D11-F**	
		3	**XS2R-D426-E11-F**	
	Connector on one cable end	2	**XS2R-D426-D10-F**	
		5	**XS2R-D426-G10-F**	
Without cable	Y-Joint plug/socket	—	**XS2R-D426-1**	10
			XS2R-D426-5	
			XS2R-D426-81	
			XS2R-D426-82	

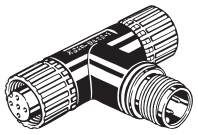
Note: XS2G Screw-on Plugs cannot be connected side-by-side to the CN1 and CN2 connectors.
Consider using a crimping or soldering model instead. Refer to page 15 for details.

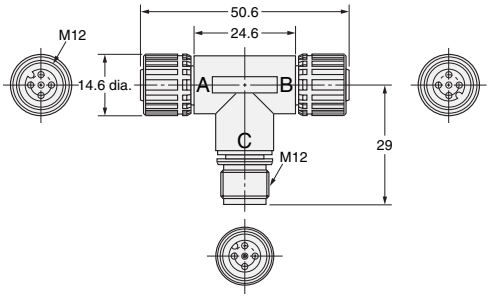
XS2R T-Joint Plug/Socket Connectors

Dimensions

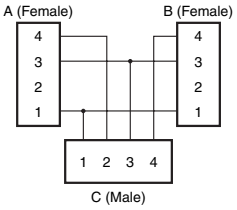
(Unit: mm)

XS2R-D422-1
XS2R-D422-5
Aggregate Models

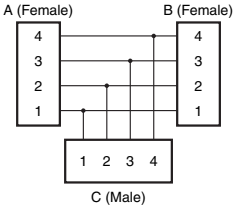




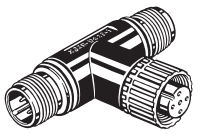
Wiring Diagram
XS2R-D422-1

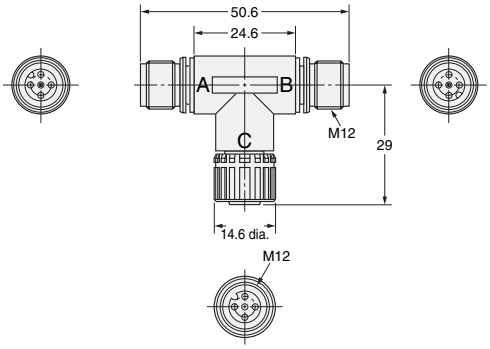


XS2R-D422-5

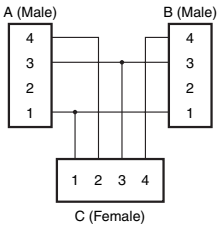


XS2R-D423-1
Bifurcated Model

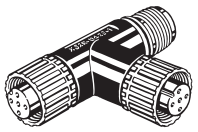


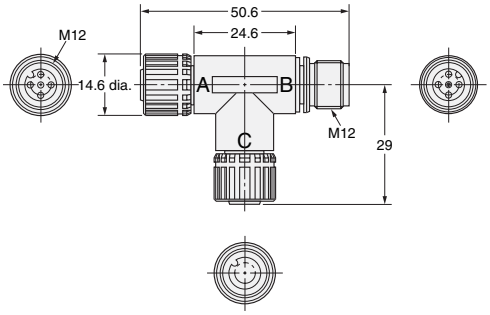


Wiring Diagram

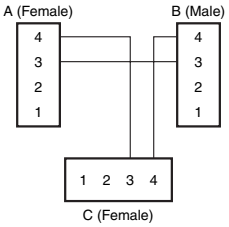


XS2R-D424-1
Daisy-chain Model





Wiring Diagram

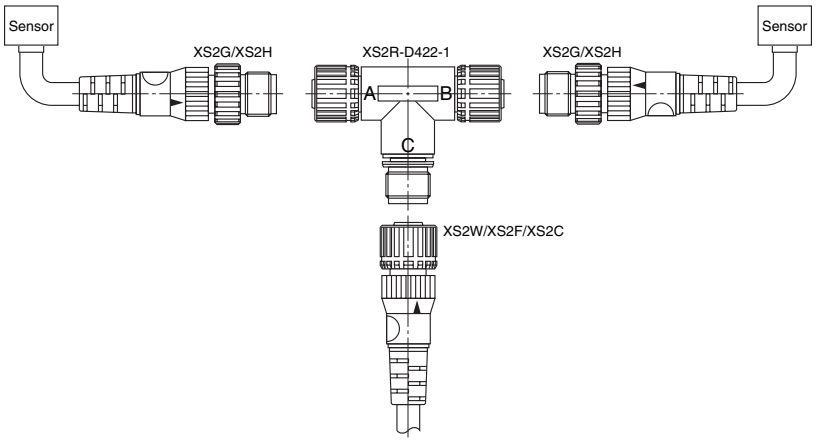


Ordering Information

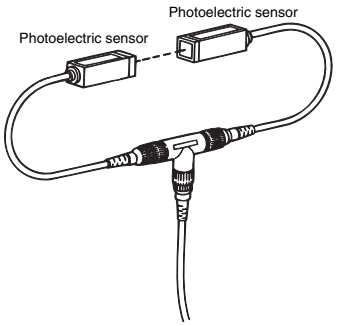
Type	Model	Minimum order
Aggregate model	**XS2R-D422-1**	20
	XS2R-D422-5	
Bifurcated model	**XS2R-D423-1**	
Daisy-chain model	**XS2R-D424-1**	

XS2R Application Examples

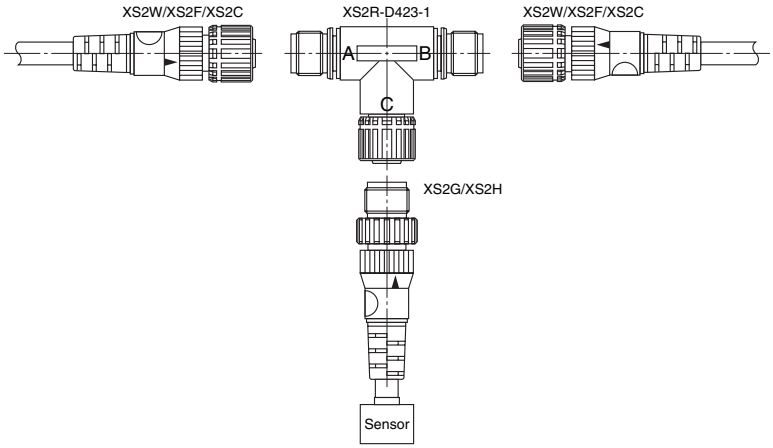
XS2R-D422-1 (Aggregate Model)



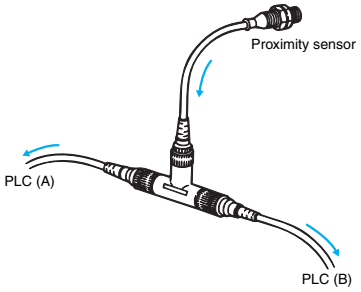
- A pair of Two-wire Sensors or Three-wire Sensors can be connected as shown in the illustration.
- The XS2R-D422-5 has feedthrough connections, thus working as a connector for the extension cable.



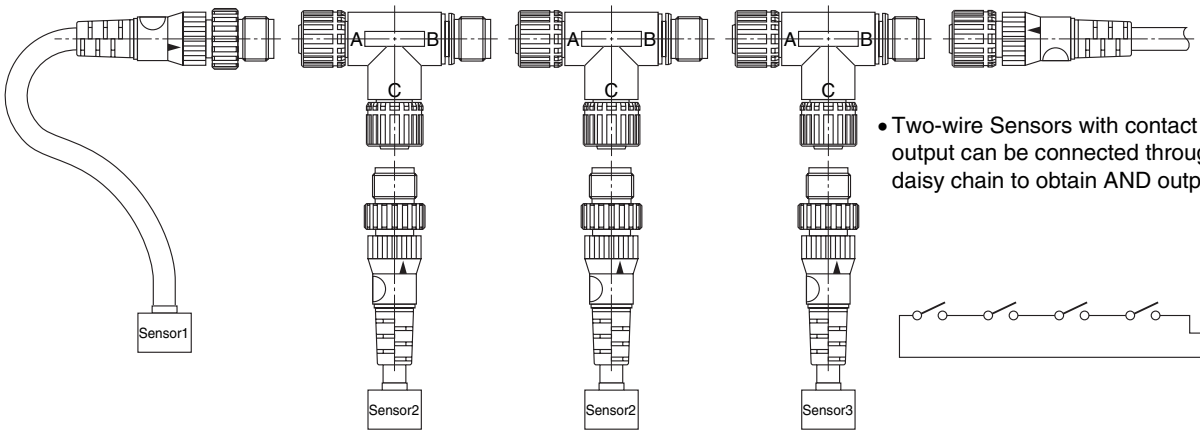
XS2R-D423-1 (Bifurcated Model)



- Two or Three-wire Sensor signals can be bifurcated.



XS2R-D424-1 (Daisy Chain Model)



- Two-wire Sensors with contact output can be connected through a daisy chain to obtain AND output.

Safety Precautions

Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

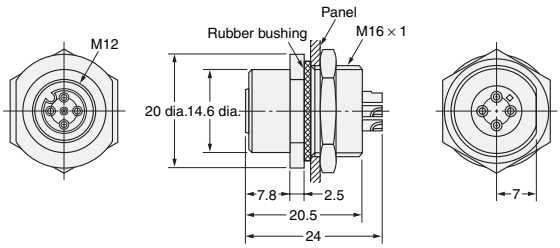
Before using the XS2R for Sensors, make sure that the wiring of the Sensors and the internal connections of the XS2R are correct.

XS2P Panel-mounting Sockets for Terminal Boxes

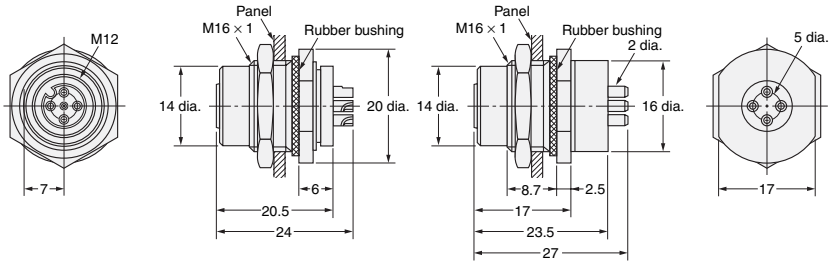
Dimensions

(Unit: mm)

XS2P-D421-2 (with Solder Cup Pins)
Rear Lock Model

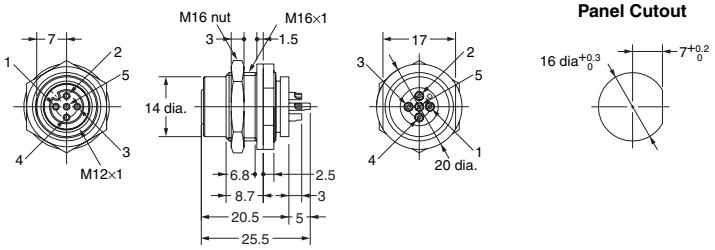


XS2P-D422-1 (with DIP Pins)
XS2P-D422-2 (with Solder Cup Pins)
Front Lock Model

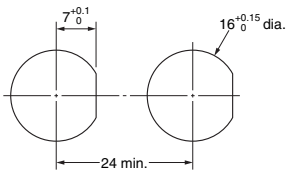


With Solder Cup Pins **With DIP Pins**

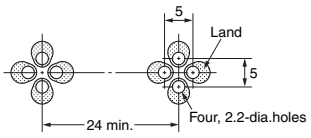
X2P-D522-1 (with DIP Pins)
XS2P-D522-2 (with Solder Cup Pins)
Panel-mounting Connector Socket, Solder-cup Terminals



Panel Cutout



PCB-mounting Dimensions



Note: The panel thickness is 1 to 4 mm.

Ordering Information

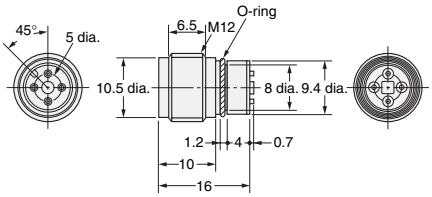
Lock method	Pin shape	Model	Minimum order
Rear lock	Solder cup pin	**XS2P-D421-2**	50
Front lock (4 pins)	Solder cup pin	**XS2P-D422-2**	
	DIP pin	**XS2P-D422-1**	
Front lock (5 pins)	Solder cup pin	**XS2P-D522-2**	
	DIP pin	**XS2P-D522-1**	

XS2M Sensor-embedded Plugs

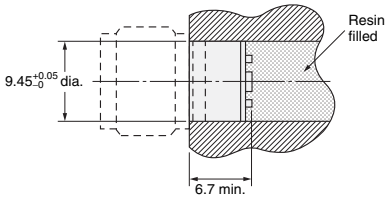
Dimensions

(Unit: mm)

XS2M-D421
(Embedded Plug with Screw Threads)

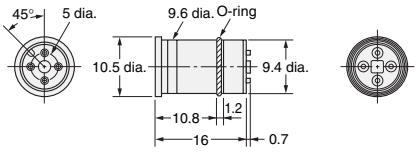


Mounted Dimensions

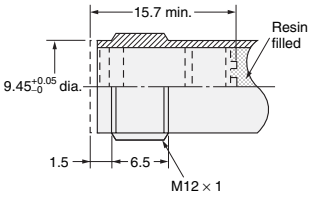


Note: After mounting, anchor the solder cups by injecting resin.

XS2M-D422
(Embedded Plug without Screw Threads)



Mounted Dimensions



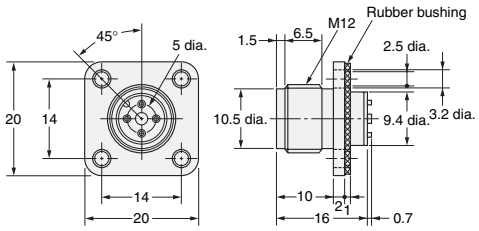
Note: After mounting, anchor the solder cups by injecting resin.

XS2M Panel-mounting Plugs

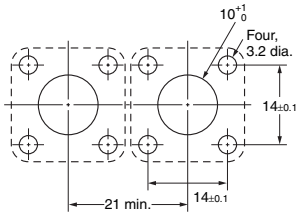
Dimensions

(Unit: mm)

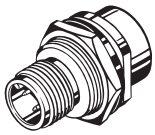
XS2M-D423
(Flange-mounting Model)

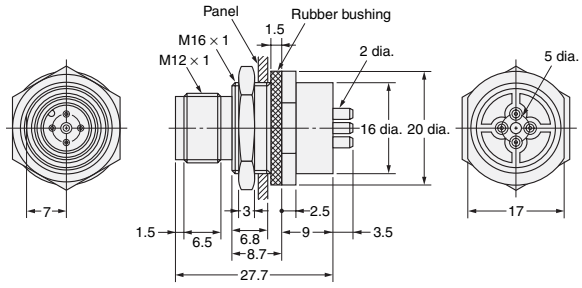


Panel Cutouts

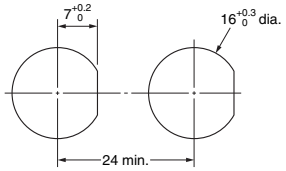


XS2M-D424-1 (With DIP Pins)
XS2M-D424-2 (With Solder Cup Pins)
(Screw-mounting Model)



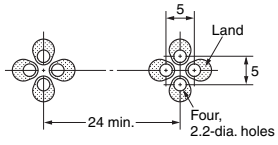


Panel Cutouts



Note: The panel thickness is 1 to 4 mm.

PCB-mounting Dimensions



Ordering Information

Mounting method	Pin shape	Poles	Model	Minimum order
Embedded with screw threads	Solder cup pin	4	**XS2M-D421**	50
Embedded with no screw threads			**XS2M-D422**	
Flange-mounting			**XS2M-D423**	
Screw-mounting	DIP pin		**XS2M-D424-1**	
	Solder cup pin		**XS2M-D424-2**	
			XS2M-D424-4	
	DIP pin	5	**XS2M-D524-1**	
	Solder cup pin		**XS2M-D524-2**	
			XS2M-D524-4	

XS2□ Sensor I/O Connectors on Cables (8-pole)

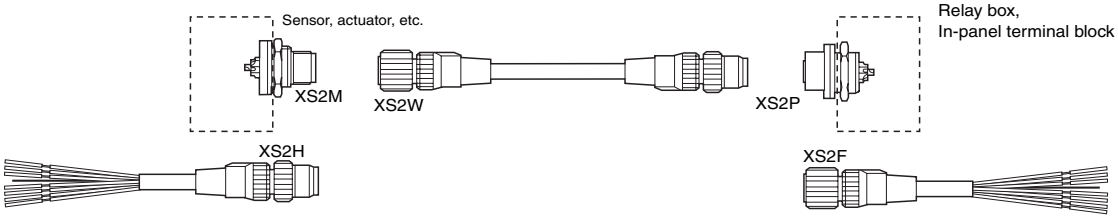
Ordering Information

Connector type	Cable connection direction	Number of cores	Cable length (m)	Model
Panel-mounting socket	—	—	—	**XS2P-D821-2**
				XS2P-D822-2
Panel-mounting plug				**XS2M-D824-4**
Plug on one cable end	Straight	8	0.3	**XS2H-D821-AH0-C**
			1	**XS2H-D821-CH0-C**
Socket on one cable end			2	**XS2F-D821-DH0-C**
			5	**XS2F-D821-GH0-C**
Plug and socket on cable ends			2	**XS2W-D821-DH1-C**
			5	**XS2W-D821-GH1-C**

Pin Numbers and Cable Lead Colors

	Pin number							
XS2F/XS2H/XS2W cable lead colors	1	2	3	4	5	6	7	8
	White	Brown	Green	Yellow	Gray	Pink	Blue	Shield

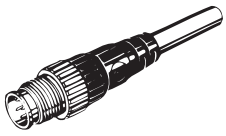
Wiring Example

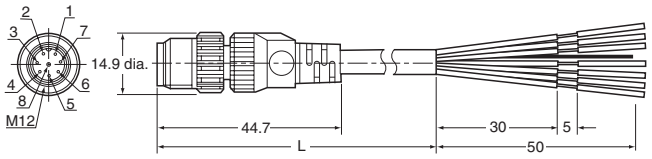


Dimensions

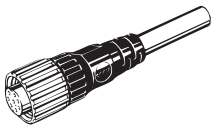
(Unit: mm)

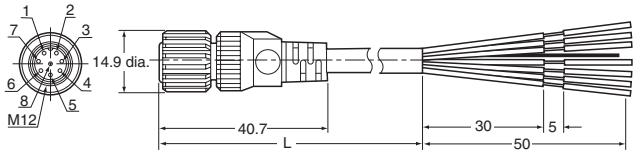
XS2H Plug on One Cable End (M12)



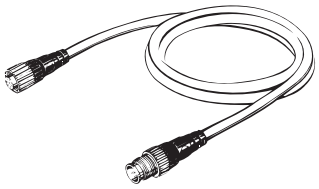


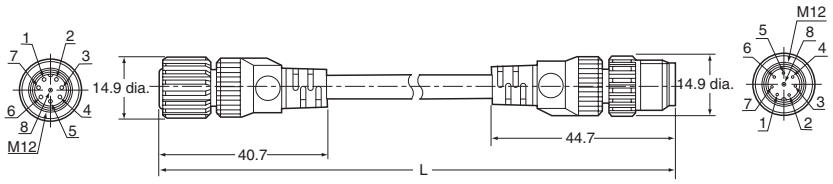
XS2F Socket on One Cable End (M12)



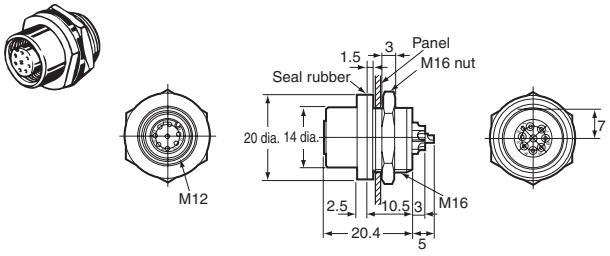


XS2W Plug and Socket on Cable Ends (M12)

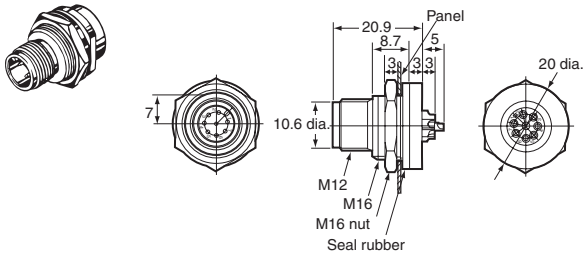




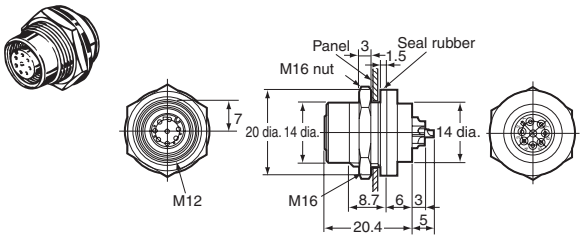
XS2P-D821-2 Panel-mounting Socket (M12) with Solder Cup Pins and Rear Lock



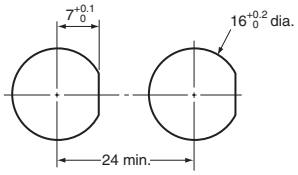
XS2M-D824-4 Panel-mounting Plug (M12) with Solder Cup Pins and Front Lock



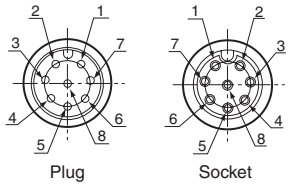
XS2P-D822-2 Panel-mounting Socket (M12) with Solder Cup Pins and Front Lock



Panel Cutouts



Connector Pin Numbers (from Mating Side)

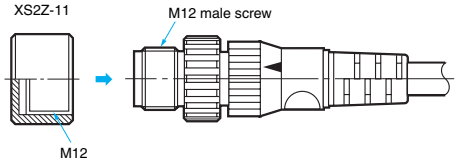


Note 1. Mounting panel thickness: 1 to 4 mm.
2. Applicable core wire size for solder cup pins: 0.5 mm^2 max.
3. The M16 nut and seal rubber are included.

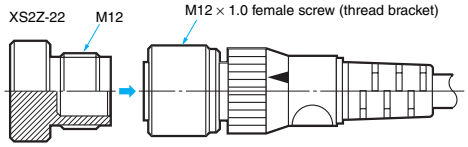
Connector Covers

Water-resistive Covers

XS2Z-11



XS2Z-22

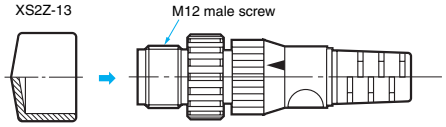


The Water-resistive Cover ensures IP67. When mounting the Water-resistive Cover to a Connector, be sure to apply a torque range between 0.39 and 0.49 N·m to tighten the Water-resistive Cover.

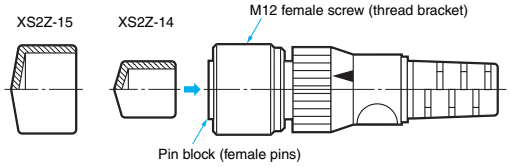
Model	Minimum order	Material	Suitable connector	
			Model	Mounting portion
XS2Z-11	50	Brass/nickel plated	XS2G/XS2H/XS2M/XS2R/XS2W/XS5H/XS5M/XS5W	M12 male screw
XS2Z-22			XS2C/XS2R/XS2F/XS2P/XS2W/XW3B/XS5F/XS5W/XS5R/XS5P/XW3D	M12 female screw (thread bracket)

Dust Covers

XS2Z-13



XS2Z-15/XS2Z-14

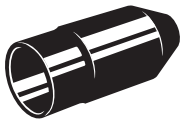


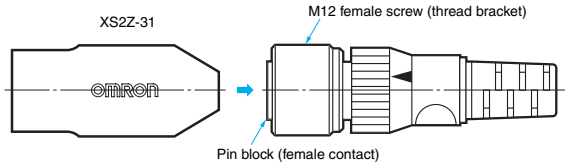
The Dust Cover is for dust prevention and does not ensure IP67 degree of protection. When mounting the Dust Cover to a connector, be sure to press the Dust Cover onto the Connector until the Connector is fully inserted into the Dust Cover.

Model	Minimum order	Material	Suitable connector	
			Model	Mounting portion
XS2Z-13	50	Rubber/black	XS2G/XS2H/XS2M/XS2R	M12 male screw
XS2Z-14			XS2C/XS2R/XS2F/XS2P/XW3A/XW3B	Pin block (female pins)
XS2Z-15				M12 female screw (thread bracket)

Sputter Protective Cover

XS2Z-31





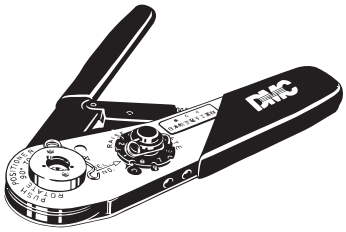
The Sputter Protective Cover protects the connector from weld sputter.
Make sure it covers the entire connector.

Model	Material	Applicable connector
XS2Z-31	Silicone rubber/black	XS2F/XS2H/XS2W

Tools

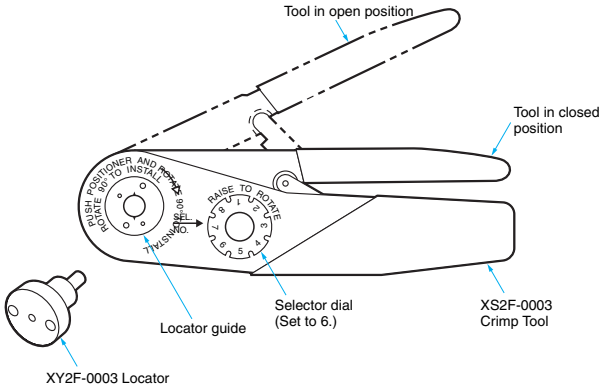
Crimp Tool

XY2F-0002



Locator

XY2F-0003



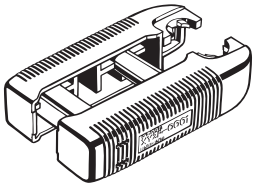
Use the Crimp Tool to crimp a cable core to the XS2U Crimping Pin used with the XS2C or XS2G Crimping Connector.

- The XY2F-0002 Crimp Tool is DMC's AFM8 (M22520/2-01).
- Mount the XY2F-0003 Locator (sold separately) to the locator guide of the Crimp Tool with a screw provided with the XY2F-0003 Locator.

Pin-block Extraction Tool

XY2F-0001

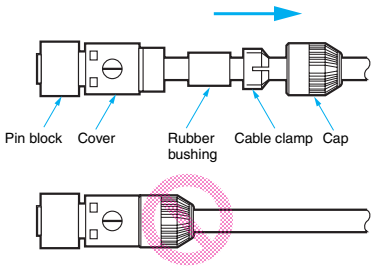
Use this tool to extract a Pin Block from the covers in order to make wiring changes or corrections after the cover has been mounted to the pin block for Connector Assemblies (XS2C/XS2G, soldering/crimping).



Extraction Procedure

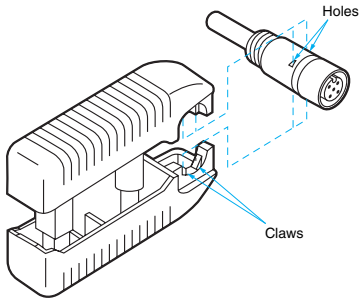
(1) Disconnecting Components

- Disconnect all components on the cap side from the cover.

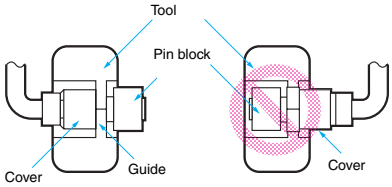


(2) Extracting Pin Block

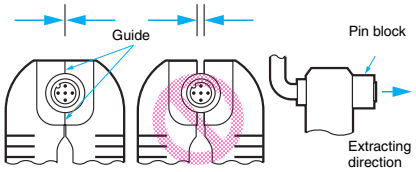
- Insert the claws of the Tool into the four holes of the cover.



- Make sure that the pin block is outside the Tool.



- Press the Tool so that the guides of the Tool are in close contact. Then pull the pin block straight.



Precaution

- The pin block must not be extracted from the same Connector more than 3 times, otherwise the proper degree of protection of the pin block or Connector will not be maintained.

Assembly Procedure for XS2C/XS2G Connector Assemblies

(1) Connector and Cable External Diameters

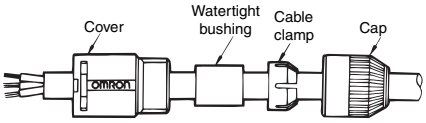
- Connectors for 6-, 4-, and 3-mm-diameter Cables (i.e., Cables that are 5 to 6, 4 to 5, and 3 to 4 mm in diameter respectively) are available. When assembling a Connector used with a cable, make sure that the external diameter of the Connector is suited to that of the cable.
- Connectors for 6-mm-diameter Cables use white cable clamps. Connectors for 4- and 3-mm-diameter Cables use black cable clamps.
  A watertight bushing for 6-mm-diameter Cable has no stripe, that for 4-mm-diameter Cable has a single stripe, and that for 3-mm-diameter Cable has two stripes.

Note: When connecting a commercially available cable to a connector assembly, use a cable with an outside diameter of 3 to 6 mm and core sizes of 0.18 to 0.75 mm^2 for crimping connectors and 0.5 mm^2 maximum for soldering connectors.

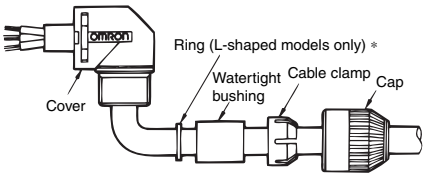
(2) Component Insertion

Crimping/Soldering Connectors

Straight Connectors



Angled Connectors

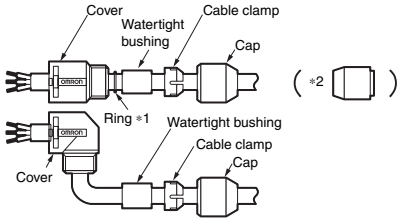


*A ring is not required for Screw-on Connectors.

- As shown in the above illustration, connect the above components to the Cable with its end processed.

Screw-on Connectors

Confirm that you have all of the required parts.



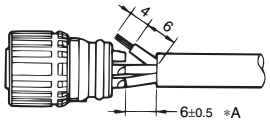
Insulation caps and insulation tubes are included with 5-core Connectors (XS2C-D5S□ and XS2G-D5S□).

*1. Rings are not required with 7-mm and 8-mm cables.

*2. Insert the waterproof bushing for 7-mm and 8-mm cables in the direction shown in the diagram.

(3) Wiring (Processing Cable Ends)

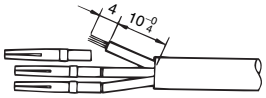
Soldering Connectors



- Strip 10 mm of the Cable sheath and 4 mm of each core.
- Before soldering cores and solder cup pins together, solder-coat each of them.
- The following conditions are recommended for soldering each solder cup pin.
  Soldering iron: 30 to 60 W
  Soldering temperature: 280°C to 340°C
  Soldering period: 3 s max.
- The length marked *A should be 6.5 mm max., otherwise the proper degree of protection of the connector will not be maintained.

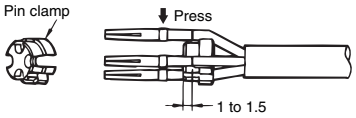
Crimping Connectors

Crimping



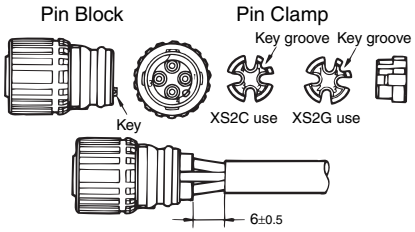
- Strip 14 mm of the Cable sheath and 4 mm of each core.
- Make sure that each core is not damaged and its end strands are not spread out.
- Mount the XY2F-0003 Locator to DMC's AFM8 (M25520/2-01) Crimping Tool, both of which are sold separately, and set the selector dial of the Crimping Tool to 6 for the XS2U-□□21 and to 7 for the XS2U-□□22.
- After mounting the crimping pins to the Locator, fully insert the cores to the crimping pins.
- Squeeze the handle of the Crimp Tool to press-fit the cores to the crimping pins.
  (Squeeze the handle firmly until the handle automatically returns to the release position.)

Wiring



- After press-fitting the cores to the pins, insert the pins into the pin clamp as shown in the illustration. Then make sure that the lead colors correspond to the pin clamp numbers that are identical to the connector pin numbers.

Insertion

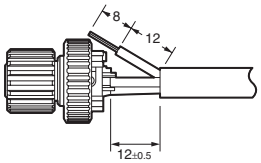


- Tentatively insert the pins to the pin block holes so that the key on the pin block will coincide with the key groove on the pin clamp. Then insert the cable along with the pin clamp.

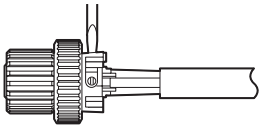
Screw-on Connectors

Cable End Processing

- **Four-core Connectors**

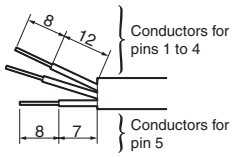


- Loosen the screws on pins 1 to 4 and insert the cores according to the pin numbers.

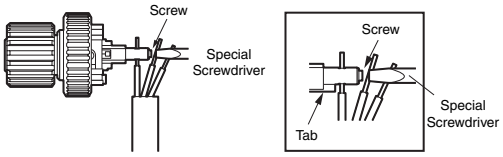


- Use the special Screwdriver (XW4Z-00B) * and tighten the screws securely so that the cores do not pull out (tightening torque: 0.15 to 0.2 N·m).

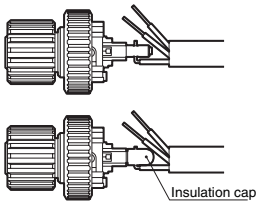
- **Five-core Connectors**
- Strip the cable sheath for a total of 15 mm and strip the core covering for 8 mm for the core to connect to pin 5.



- Connect the core to pin 5 (in the center) first.
- Insert the core from the side of the hold with the tab and tighten the screw securely (tightening torque: 0.15 to 0.2 N·m), and then cut off the excess wire with wire cutters.



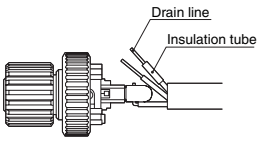
- Bend the cable as shown below, attached the enclosed insulation cap, and then strip the other cores.



- Connect the cores to pins 1 to 4.

Connecting Shielded Cables to Five-core Connectors

- Place the insulation tube on the drain line of the shield and connect to the terminal.
- Tighten the screw and then check visually to see if there is insulation between the cores.



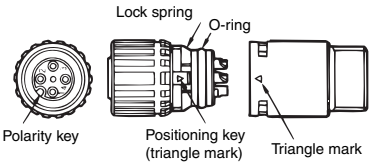
- Connect the cores to pins 1 to 4.

* When tightening the screws, use the dedicated XW4Z-00B Screwdriver that matches with the screw-slot dimensions.

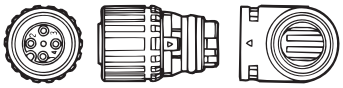
XW4Z-00B Screwdriver

(4) Inserting Pin Block

Pin Block (Soldering Model) **Cover (Straight Model)**

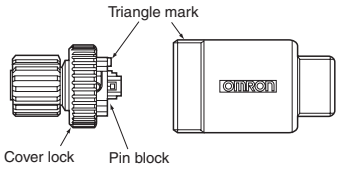


(Crimping Model) **(Angled Model)**



- Mount the cover to the pin block so that the triangle mark on the pin block will coincide with the triangle mark on the cover.
- If the cover is used for an L-shaped model, the relationship between the position of the polarity key on the engaged side and cable connection direction will be determined by the direction in which the positioning key is inserted into the cover, which can be rotated by 90°.
- Fully insert the positioning key until the positioning key is hidden by the casing.

Pin Block
(Screw-mounting Connectors) Cover

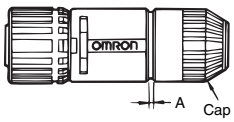


- Align the triangular marks on the pin block and cover and insert the pin block into the cover.
- Press them together firmly (0.39 to 0.49 N·m) until the pin block does not come out of the cover.

(5) Mounting Cap

- After mounting the cover to the pin block and the cover snaps into place, tighten the cap securely by hand within a torque of 0.39 and 0.49 N·m.

Note: If the cap is not tighten securely enough, the degree of protection (IP67) may not be maintained or vibration may cause the cap to become loose. Do not tighten the cap with pliers or similar tools; they may damage the cap.



- After fully tightening the cap, length A should be approximately one of the following according to the cable external diameter and the Connector model.

Connector	Cable external diameter (mm)			
	6 mm	5 mm	4 mm	3 mm
For 6-mm-dia. cable	1	0	—	—
For 4-mm-dia. cable	—	2	1	—
For 3-mm-dia. cable	—	—	2	1

(6) After Assembly

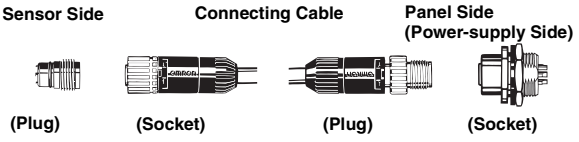
- Confirm the insulation between cores after completing assembly.

Recommended Cables

When connecting a commercially available cable to a connector assembly, use a cable with an outside diameter of 3 to 6 mm and core sizes of 0.18 to 0.75 mm^2 for crimping connectors and 0.5 mm^2 maximum for soldering connectors.

Connector Arrangement

For safety, when constructing a connection system between a Sensor and panel with a connector, make sure that the connector plug is on the Sensor side and the connector socket is on the panel side (i.e., the female pins are located on the power-supply side).



Safety Precautions

Precautions for Correct Use

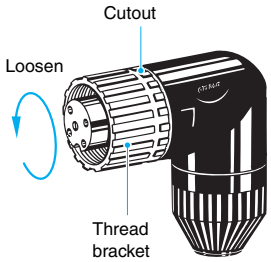
Do not use the product in atmospheres or environments that exceed product ratings.

Tightening Cap (Connector Assemblies)

1. Do not use pliers to tighten caps, otherwise the caps may be damaged. Be sure to tighten each cap by hand within a torque range between 0.39 and 0.49 N·m.
2. If caps are not tightened securely, the Connectors may not maintain their proper degree of protection (i.e., IP67) or the caps may become loose due to vibration.

Connector Connection and Disconnection

- When connecting or disconnecting Connectors, be sure to hold the Connectors by hand.
- Do not hold the cable part when disconnecting Connectors.
- Connectors mating with sockets must be fully inserted into the sockets. Tighten the thread bracket carefully so that the threads will not be damaged.
- Fully tighten thread bracket within a torque range between 0.39 and 0.49 N·m and be sure that the threads of the opposite parts are hidden by the thread bracket.
- When disconnecting Connectors, be sure to loosen the thread brackets first. Do not loosen the caps.
- Thread brackets must be loosened in the cutout direction.



Degree of Protection

- Do not impose external force continuously on the joints of pin blocks and covers, otherwise the Connectors may not keep its proper degree of protection (i.e., IP67).
- The degree of protection of connectors (IP67) is not for a fully watertight structure. Do not use them underwater.
- Connectors are of resin mold construction. Do not impose excessive force on them.

Setup

- Do not make any cable bends near the base of the Unit.
- Any bends made must have a minimum radius of 40 mm.