# OMRON

Omron's Ethernet Cables and Connectors The best connection for both inside and outside the panel



In coordination with our extensive lineup of telecommunication products, our Ethernet cables deliver

# Reliable connection quality

### Industrial Ethernet Cables Series

With the growing prevalence of IoT, automated factory sites are also replacing serial connection with Ethernet as their main method of communication, and their expectations for connection quality are becoming increasingly demanding.

At Omron, we provide an extensive array of Industrial Ethernet cables and connectors that our unique technologies in connection (One-touch Smartclick) and environmental resistance to enable reliable connection.These products support both controller-level and device-level networks, and can be used together with general-purpose Ethernet as well.

You can ensure connection quality by coordinating them with our PLCs and other products from our assortment of Ethernet devices.



## FACTORY AUTOMATION

# MACHINE CONTROL

Machine Automation Controller / Industrial PC with Sysmac Machine Control



🍫 Motion





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#### STEP1 | Select by standard / use environment

# Omron's Cables and Connectors support EtherNet/IP™, EtherCAT<sup>®</sup>, and other Industrial Ethernet, allowing for selection according to standard and use environment

### 1.Select by cable standard (Ethernet speed)

Be sure to use Ethernet Cables and Connectors that supports Ethernet speed you need. Check the Ethernet speed of your PLC, sensors, and any other component you plan to use and select cables and connectors that complies with the necessary standards.

			Cable and Connectors standards						
✓Supported $*$ Supported when cable length ≦37 m		Cat5	Cat5e	Cat6	Cat6A				
		10BASE-T	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$			
Ethernet Higher speed (Band rate)	Higher	100BASE-TX	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$			
		1000BASE-T	-	$\checkmark$	$\checkmark$	$\checkmark$			
		10GBASE-T	-	-	$\checkmark^*$	$\checkmark$			

### Cat6A For high-speed communication

Cables with RJ45 Connectors



Cat5e

Cables with RJ45 Connectors

Cables with M12 Connectors (Round Water-resistant Connectors)



- Notes: 1. We recommend for 100BASE-TX/10BASE-T, use STP (shielded twisted-pair) cable of category 5 or higher and 1000BASE-T, use STP cable of category 5e or higher with double shielding (aluminum tape and braiding).
  - 2. For Power over Ethernet (PoE) applications, use cable of category 5 or higher and make sure to check the rated values of both the PoE device and Ethernet Cables and Connectors.

### 

### 2. Select by cable use environment

Use RJ45 connectors for in-panel wiring and M12 connectors (Round Water-resistant Connectors) with IP67 protection for wiring outside the control panel where environmental resistance is required.



Note: The data on this page are the results of OMRON testing. They may vary for your environment and application conditions. Treat them as a reference. STEP2 Use properly products according to feature

# Extensive lineup of high-quality products allows for use of different models according to purpose

### Product features

#### **RJ45** Connectors

#### Cables with standard RJ45 Connectors XS6W-6PUR





#### · Compact RJ45 connectors reduce in-panel cable routing space

- · Enhanced wiring flexibility
- · Double-shielded for use in hostile, noisy environments

>P.11

#### Cables with standard RJ45 Connectors XS6W-6LSZH



- Individual foil shield
- · Compact RJ45 connectors reduce in-panel cable routing space
- Flame-retardant low smoke zero halogen (LSZH) cables produce very little toxic gases even if they should burn
- · Cable colors include blue, yellow, or green.
- Note: This model, while single-shielded, has been confirmed to provide communication/noise characteristics that meet the standards.

#### Cables with Rugged RJ45 Connectors XS5W-T421- MD-





- · RJ45 connectors with tough latch structure
- · Double-shielded for use in hostile, noisy environments

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>P.11

#### M12 Connectors

#### Cables with standard M12 Connectors $XS5\Box$ -T42 $\Box$ - $\Box$ M $\Box$ - $\Box$ $\Box$





- Environment-resistant M12 connectors (Round Water-resistant Connectors) with IP67 protection that can be mated one-touch (approximately 1/8 of a turn)
- Double-shielded for use in hostile, noisy environments
- · Extensive product lineup, including cables with right-angle connectors and those for panel mounting

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#### Cables with Strengthened shield M12 Connectors XS5 --- T42 -- M -- SS



 Offers environmental resistance and one-touch mating, with strengthened shielding for enhanced noise resistance.

Copper foil tape added to connector portion for improved communication characteristics.

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#### RJ45 Assembly Connectors XS6G-T421-1

Enables easy on-site Ethernet cable assembly without crimp tools or other special tools.



### System Configuration

Sysmac Automation Platform



#### TIPS | Basic guide to Industrial Ethernet cables

### Specifications of Industrial Ethernet cables

Twisted-pair cables and their shielding play key roles in ensuring communication quality in hostile factory.



### What is a twisted-pair cable?

A cable consisting of a pair of wires twisted together is commonly called a twisted-pair cable. Its relative resistance to noise has made it the cable most widely used for Ethernet and other communication.



### Effects of shielding

Industrial twisted-pair cables are shielded to further improve their noise resistance. STP (shielded twisted-pair) cables, also called FTP (folded twisted-pair) cables, are distinguished from UTP (unshielded twisted-pair) cables used in regular office environments.



### Ethernet cable standards / points of note

There are several things to note in enabling stable operation of PLCs and other Ethernet communication devices. Observe the following when selecting and using Ethernet cables.

### **POINT1** Compliance to Ethernet cables standards

Ethernet is a LAN protocol, and based on standards by Ethernet speed (Band rate).

The higher the communication speed, the higher the transmission signal frequency and the more susceptible it is to noise. Choose the right cable to ensure standard-compliant communication speed.

To find an Omron product that best suits your needs, see "1. Select by cable standard (band rate for Ethernet)" on page 04.

10BASE-T	<ul> <li>10 Mbit/s communication speed</li> <li>Star network (LAN) with maximum cable length of 100 m</li> </ul>
100BASE-TX	<ul> <li>High communication speed of 100 Mbit/s</li> <li>Many 100BASE-TX devices are 10BASE-T compatible, allowing for mixed</li> </ul>
10GBASE-T	<ul> <li>Next-generation high-speed network that can provide 10 Gbit/s connections</li> <li>Significantly reduces data transfer time, increasing efficiency</li> </ul>

Standard requirement examples

### **POINT2** Ethernet cable wiring / use environment

Actual Ethernet cable wiring entails bending in many places, as shown in Figure 1.

When cables are bent (Figure 2), it induces noise; users should therefore take into account the place of installation (in-panel and outside), installation space, and equipment configuration and choose a cable that is suited for their purpose.

▶ To find an Omron product that best suits your needs, see "2. Select by cable use environment" on page 05.



#### Figure 1. Wiring example

Figure 2. How bending can affect twisted-pair structure







Bending radius < specified minimum: Twisted-pair structure iscompromised, increasing noise susceptibility

Note: For minimum bending radius (R) values, see "Safety Precautions" on page 26.

# Industrial Ethernet Cables

### Cables and Connectors for EtherNet/IP<sup>™</sup>, EtherCAT<sup>®</sup> and Other Industrial Ethernet Networks

**Cables with RJ45 Connectors** 

- For in-panel wiring
- LSZH with Standard RJ45 Connectors (Cat6A)
- PUR with Standard RJ45 Connectors (Cat5 and Cat6A)
- PVC with Rugged RJ45 Connectors (Cat5e)

Cables with M12 Connectors (Round Water-resistant Connectors)

- For wiring outside the control panel where environmental resistance is required.
- PVC with M12 Connectors (Cat5e) that enables one-touch (1/8 turn) locking.
- XS5W-T42D-C-K/KŔ/SS\* series products are UL certified. \* Does not include all models.
- PVC Robot cable are available.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.



### **Connection Examples**

#### Cables with Standard RJ45 Connectors

#### **Model Number Structure**

#### **Model Number Legend**

Use this legend when determining the product specifications from the model number. Choose from the model numbers listed in *Ordering Information* when ordering.

6 7

### XS6W-0 0000 8 SS 0000CM-0 0

5

①②③④①Transmission Characteristics

- 5: Category 5
- 6: Category 6A

#### **2**Sheath Material

LSZH: LSZH PUR: PUR

#### **3Number of Pins**

8: 8 pins

# **Cable Attachment Direction**SS: Straight/Straight

#### **5**Cable Length

20: 0.2 m 30: 0.3 m 50: 0.5 m 100: 1 m 150: 1.5 m 200: 2 m 300: 3 m 500: 5 m 750: 7.5 m 1000: 10 m 1500: 15 m 2000: 20 m

#### **6**Sheath Color

B: Blue

Y: Yellow

G: Green

#### $\ensuremath{\overline{\mathcal{O}}}\xspace$ Cable Specifications

F: Flexibility-improved Type (Standard Cable) None: Standard Cagle

### **Ordering Information**

Appearance	Cable specifications	Туре	Category	Cable sheath material	Cable length (m)	Model
					0.2	XS6W-6PUR8SS20CM-YF
					0.3	XS6W-6PUR8SS30CM-YF
					0.5	XS6W-6PUR8SS50CM-YF
					1	XS6W-6PUR8SS100CM-YF
					1.5	XS6W-6PUR8SS150CM-YF
	Flexibility-improved				2	XS6W-6PUR8SS200CM-YF
	Type (Standard Cable)			PUR	3	XS6W-6PUR8SS300CM-YF
A CONTRACT OF A	(Standard Cable)				5	XS6W-6PUR8SS500CM-YF
4					7.5	XS6W-6PUR8SS750CM-YF
					10	XS6W-6PUR8SS1000CM-YF
					15	XS6W-6PUR8SS1500CM-YF
					20	XS6W-6PUR8SS2000CM-YF
		-			02	XS6W-6LSZH8SS20CM-B
					0.3	XS6W-6LSZH8SS30CM-B
					0.5	XS6W-6LSZH8SS50CM-B
					1	XS6W-6LSZH8SS100CM-B
					1.5	XS6W-6LS2H8SS150CM-B
					1.5	X56W-6L52H055150CM-B
1					2	X56W-6L5211055200CM-B
					5	
4					5	
					7.5	X50W-0L52H055750CM-D
					10	X50W-0L52H0551000CM-B
				-	15	XS6W-6LS2H8SS1500CM-B
	-		Cat6A		20	XS6W-6LSZH8SS2000CM-B
					0.2	XS6W-6LSZH8SS20CM-Y
	Cable with Connectors on Both Ends (RJ45/RJ45)				0.3	XS6W-6LS2H8SS30CM-Y
					0.5	XS6W-6LS2H8SS50CM-Y
		Cable with			1	XS6W-6LS2H8SS100CM-Y
		Connectors on Both Ends			1.5	XS6W-6LS2H8SS150CM-Y
		(RJ45/RJ45)		LSZH	2	
			3			
					5	XS6W-6LS2H8SS500CM-Y
					7.5	XS6W-6LS2H8SS750CM-Y
					10	XS6W-6LS2H8SS1000CM-Y
	Standard Cable				15	XS6W-6LS2H8SS1500CM-Y
	-				20	XS6W-6LS2H8SS2000CM-Y
					0.2	XS6W-6LS2H8SS20CM-G
					0.3	XS6W-6LS2H8SS30CM-G
					0.5	XS6W-6LS2H8SS50CM-G
					1	
					1.5	XS6W-6LS2H8SS150CM-G
					2	XS6W-6LS2H8SS200CM-G
					3	XS6W-6LS2H8SS300CM-G
Ø					5	XS6W-6LSZH8SS500CM-G
4					7.5	XS6W-6LSZH8SS750CM-G
					10	XS6W-6LSZH8SS1000CM-G
					15	XS6W-6LSZH8SS1500CM-G
					20	XS6W-6LSZH8SS2000CM-G
					0.5	XS6W-5PUR8SS50CM-G
					1	XS6W-5PUR8SS100CM-G
					1.5	XS6W-5PUR8SS150CM-G
					2	XS6W-5PUR8SS200CM-G
			Cat5	PUR	3	XS6W-5PUR8SS300CM-G
					5	XS6W-5PUR8SS500CM-G
a de la companya de l					7.5	XS6W-5PUR8SS750CM-G
-					10	XS6W-5PUR8SS1000CM-G
					15	XS6W-5PUR8SS1500CM-G
					20	XS6W-5PUR8SS2000CM-G

### Specifications

	Туре	Cable with Connectors on Both Ends (RJ45/RJ45)/LSZH	Cable with Connectors on Both Ends (RJ45/RJ45)/PUR				
Item	Model	XS6W-6LSZH8SS	XS6W-5PUR8SS	XS6W-6PUR8SS			
Rated current	urrent 1 A (at 50°C)						
Rated voltage *		30 VDC					
Contact resistance		20 mΩ max.					
Insulation resistance		500 MΩ min.					
Withstand voltage		1,000 VDC for 60 s (leakage current: 1 m/	A max.)				
Ambient operating tempe	erature	-20 to 75°C -40 to 80°C -30 to 75°C					
Ambient storage tempera	ature	−20 to 75°C         −40 to 80°C         −20 to 70°C					
Protective structure		IP20					

\* Voltage varies by installation environment.

### **Materials and Finish**

#### Connectors

	Туре	Cable with Connectors on Both Ends (RJ45/RJ45)/LSZH	Cable with Connectors on Both Ends (RJ45/RJ45)/PUR				
Item	Model	XS6W-6LSZH8SS					
Connector housing		PC resin					
Contacts		Copper alloy/Gold plating					
Shield		Copper alloy/Nickel plating					
Anchors							
Anchors (tabs)							
Cover (structured to prevent th from breaking)	ie tab	PA resin					
Marking tube		PVC resin					

#### Cables

	Туре	Cable with Connectors on Both Ends (RJ45/RJ45)/LSZH	Cable with Connectors on Both Ends (RJ45/RJ45)/PUR				
Item	Model	XS6W-6LSZH8SS	XS6W-5PUR8SS	XS6W-6PUR8SS			
Compliant standard		IEC 60332-1 /UL444	IEC 60332-1	IEC 61156-6, IEC11801, IEC 60332-1			
Category Cat6A		Cat6A	Cat5	Cat6A			
Number of cores		AWG26	4WG26				
Outer diameter *1		6.3 dia.	6.0 dia.	6.5 dia.			
Sheath color *2 Blue, Yellow, Green		Green	Yellow				
Sheath material		LSZH	PUR				
Shield structure		Single shield	Double shield				



### Dimensions



# Cables with Rugged RJ45 Connectors, and Cables with M12 Connectors (Round Water-resistant Connectors)

#### **Model Number Structure**

#### **Model Number Legend**

Use this legend when determining the product specifications from the model number. Choose from the model numbers listed in *Ordering Information* when ordering.

#### Cable with Connectors



#### 0 Connector Shape

H: Cable with plug on one end W: Cable with connectors on both ends

- 2Type
- T: Ethernet

**3Number of Pins** 

4: 4 pins

#### **4**Contact Plating Specification

2: Gold plating

**⑤Cable Attachment Direction (M12 Connectors)** 

- 1: Straight
- 2: Right angle

#### **6**Cable Length

A: 0.3 m	J: 10 m
B: 0.5 m	K: 15 m
C: 1 m	L: 20 m
D: 2 m	T: 25 m
E: 3 m	N: 30 m
F: 4 m	Z: 35 m
W: 4.5 m	P: 40 m
G: 5 m	X: 50 m

#### **OConnector Shape**

- 0: M12 plug on one end
- 1: Connectors on both ends: M12 socket/M12 plug
- 2: Connectors on both ends: M12 plug/M12 plug
- 3: Connections on both ends: M12 socket/M12 socket
- C: Connectors on both ends: M12 plug/RJ45 plug
- D: Connectors on both ends: RJ45 plug/RJ45 plug
- E: Connectors on both ends: M12 socket/RJ45 plug

#### **®Cable Specification**

- K: Standard cable (Cable color: Light blue)
- Y: Standard cable (Cable color: Yellow)
- KR: Robot cable (Cable color: Light blue)
- YR: Robot cable (Cable color: Yellow)
- SS: Shield Strengthening model

(Standard cable, Cable color: Black)

Note.M12 connector locking type is D-coding.

#### RJ45 Assembly Connectors

XS6G-T 4 2 1-1 1 2 3 4 5

#### ①Type

T: Ethernet

②Number of Pins

4: 4 pins

- **3**Contact Plating Specification
- 2: Gold plating
- **4**Cable Attachment Direction
- 1: Straight

**5**Degree of Protection

1: IP20

#### • M12 Connectors for Panel Mounting

#### ①**Type**

T: Ethernet

#### ②Number of Pins

- 4: 4 pins
- ③Plating Specification2: Gold plating

#### **Mounting Method**

- 6: Rear lockingt
- 7: Front locking
- 8: Rear lockingt (with connector anti-rotation mechanism)

#### **⑤Terminal Shape**

- 1: DIP terminalst
- 5: Cable with loose wires (0.5 m)

### **Ordering Information**

Appearance	Cable	Category	Cable sheath	Туре	Cable length	Model
	opeomodione		matorial		0.5	XS5H-T421-BM0-K
					1	XS5H-T421-CM0-K
				Cable with Plug	2	XS5H-T421-DM0-K
				on One End	3	XS5H-T421-EM0-K
				(M12 Straight)	5	XS5H-T421-GM0-K
					10	XS5H-T421-JM0-K
Color					15	XS5H-T421-KM0-K
	-				0.5	XS5W-T421-BM2-K
					1	XS5W-T421-CM2-K
					2	XS5W-T421-DM2-K
-					3	XS5W-T421-EM2-K
					5	XS5W-T421-GM2-K
				Cable with Plugs	10	XS5W-T421-JM2-K
				on Both Ends	15	XS5W-T421-KM2-K
				(M12 Straight/M12 Straight)	0.3	XS5W-T421-AM2-Y
C.A.					0.5	XS5W-T421-BM2-Y
Color ••					1	XS5W-T421-CM2-Y
					2	XS5W-T421-DM2-Y
					3	XS5W-T421-EM2-Y
					5	XS5W-T421-GM2-Y
					0.3	XS5W-T421-AMC-K
					0.5	XS5W-T421-BMC-K
					1	XS5W-T421-CMC-K
					2	XS5W-T421-DMC-K
					3	XS5W-T421-EMC-K
					5	XS5W-T421-GMC-K
				Cable with Plugs	10	XS5W-T421-JMC-K
				(M12 Straight/RJ45)	15	XS5W-T421-KMC-K
					0.3	XS5W-T421-AMC-Y
Color ••					0.5	XS5W-T421-BMC-Y
					1	XS5W-T421-CMC-Y
					2	XS5W-T421-DMC-Y
	Standard	Cat5e	PVC		3	XS5W-T421-EMC-Y
	Cable		_		5	XS5W-T421-GMC-Y
					0.3	XS5H-T422-AM0-K
					0.5	XS5H-T422-BM0-K
				Cable with Plug	1	XS5H-T422-CM0-K
				on One End	2	XS5H-T422-DM0-K
				(M12 Right-angle)	3	XS5H-1422-EM0-K
Color					5	XS5H-1422-GMU-K
					10	XS5H-1422-JMU-K
	-				15	XS5H-1422-KMU-K
4.5357					0.3	X55W-1422-AM2-K
2					0.5	XS5H-1422-DW2-K
W				Cable with Plugs	2	XS5W-T422-DW2-K
				(M12 Right-angle/	3	XS5W-T422-DW2-K
				M12 Right-angle)	5	XS5W-T422-GM2-K
Color					10	XS5W-T422IM2-K
					15	XS5W-T422-KM2-K
					0.3	XS5W-T422-AMC-K
					0.5	XS5W-T422-BMC-K
					1	XS5W-T422-CMC-K
				Cable with Plugs	2	XS5W-T422-DMC-K
				on Both Ends	3	XS5W-T422-EMC-K
				(IVI I∠ HIGNT-angle/HJ45)	5	XS5W-T422-GMC-K
Color •					10	XS5W-T422-JMC-K
					15	XS5W-T422-KMC-K
	1				0.3	XS5W-T421-AMD-K
					0.5	XS5W-T421-BMD-K
1					1	XS5W-T421-CMD-K
				Cable with Plugs	2	XS5W-T421-DMD-K
				on Both Ends	3	XS5W-T421-EMD-K
				(HJ45/HJ45)	5	XS5W-T421-GMD-K
Color •					10	XS5W-T421-JMD-K
					15	XS5W-T421-KMD-K

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Annearance	Cable	Category	Cable sheath	Туре	Cable length	Model
	specifications	Outegoly	material	Турс	(m)	Model
					0.5	XS5W-T421-BM1-K
					1	XS5W-T421-CM1-K
				Cable with Plug	2	XS5W-T421-DM1-K
				Socket on Other End	3	XS5W-T421-EM1-K
				(M12 Straight/M12 Straight)	5	XS5W-T421-GM1-K
Color					10	XS5W-T421-JM1-K
					15	XS5W-T421-KM1-K
					0.5	XS5W-T421-BME-K
1	Standard				1	XS5W-T421-CME-K
	Cable			Cable with Plug	2	XS5W-T421-DME-K
				on One End and	3	XS5W-T421-EME-K
				(M12 Straight/B.I45)	5	XS5W-T421-GME-K
				( 0	10	XS5W-T421-JME-K
					15	XS5W-T421-KME-K
	-					
					1	XS5W-T421-CM3-K
				Cable with Socket		
				on Both Ends	2	XS5W-T421-DM3-K
				(M12 Straight/M12 Straight)		
Color					0.5	XS5W-T421-BM3-YR
-					0.5	XS5W-T421-BM1-KR
					1	XS5W-T421-CM1-KR
				Cable with Plug	2	XS5W-T421-DM1-KR
				Socket on Other End	3	XS5W-T421-EM1-KR
10				(M12 Straight/M12 Straight)	5	XS5W-T421-GM1-KR
Color					10	XS5W-T421-JM1-KR
					15	XS5W-T421-KM1-KR
				Cable with Plugs on Both Ends (M12 Straight/M12 Straight)	0.5	XS5W-T421-BM2-KR
					1	XS5W-T421-CM2-KR
			PVC		2	XS5W-T421-DM2-KR
- 50		Cat5e			3	XS5W-T421-EM2-KR
					5	XS5W-T421-GM2-KR
					10	XS5W-T421-JM2-KR
					15	XS5W-T421-KM2-KR
C.L.					1	XS5W-T421-CM2-YR
Color					2	XS5W-T421-DM2-YR
					3	XS5W-T421-EM2-YR
					5	XS5W-T421-GM2-YR
					0.5	XS5W-T421-BMC-KR
	Data 10.11				1	XS5W-T421-CMC-KR
	Robot Cable				2	XS5W-T421-DMC-KR
					3	XS5W-T421-EMC-KR
					5	XS5W-T421-GMC-KR
				Cable with Plugs	10	XS5W-T421-JMC-KR
				on Both Ends	15	XS5W-T421-KMC-KR
				(IVI 12 Straight/RJ45)	3	XS5W-T421-EMC-YR
Color					5	XS5W-T421-GMC-YB
					10	XS5W-T421-JMC-YP
					15	XS5W-T421-KMC-VP
					20	XS5W-T421-I MC-VP
	-				0.5	XS5W-T421-EMO-TR
					1	XS5W-T421-CMD-KP
					2	XS5W-T421-DMD-KP
					2	XS5W-T421-DWD-KR
1					5	X95W-1421-EMD-KR
				Cable with Pluos	5 10	VESW-T421-GWD-KR
				on Both Ends	10	ASSW-1421-JMD-KK
				(RJ45/RJ45)	15	ASSW-1421-KMD-KR
					0.5	ASSW-1421-BMD-YR
Color 🔍					1	X55W-1421-CMD-YR
					2	xS5W-1421-DMD-YR
					3	XS5W-T421-EMD-YR
					5	XS5W-T421-GMD-YR

Note.For cable lengths other than those listed above, refer to page 25.

Appearance	Cable specifications	Category	Cable sheath material	-	Гуре	Cable length (m)	Model
							XS5W-T421-BM2-SS
						1	XS5W-T421-CM2-SS
				Cable	with Plugs	2	XS5W-T421-DM2-SS
				(M12 Straig	ht/M12 Straight)	3	XS5W-T421-EM2-SS
	Shield					5	XS5W-T421-GM2-SS
Color •	Strengthening	CatEo	<b>BVC</b>			10	XS5W-T421-JM2-SS
	(Standard	Calle	FVC			0.5	XS5W-T421-BMC-SS
	cable)					1	XS5W-T421-CMC-SS
				Cable with Plugs on Both Ends (M12 Straight/RJ45)		2	XS5W-T421-DMC-SS
						3	XS5W-T421-EMC-SS
Calar						5	XS5W-T421-GMC-SS
						10	XS5W-T421-JMC-SS
		Cat5		RJ45 Assei	mbly Connector		XS6G-T421-1
					Rear locking	0.5	XS5P-T426-5
		Cat5e		M12 Connector for Panel Mounting *	Rear locking (with connector anti-rotation mechanism)	0.5	XS5P-T428-5
				meaning	Front locking	0.5	XS5P-T427-5
				M12 Panel-mounting PCB Straight Terminals *			XS5P-T426-1

Note.Please consult with OMRON for types other than the above.

The rear locking type is attached from the front of the panel, and the nut is tightened from the back.

The front locking type is attached from the back of the panel, and the nut is tightened from the front.

#### ● Cable Bending Data for Robot Cables (XS5W-T421-□M□-□R)

The following data is the results of OMRON testing for cable bending test conditions. The number of bends may vary for your environment and application conditions.

#### Cableveyor test

Number of bends: 20 million min.



Speed: Approx. 120 m/minute Distance moved: 1 m Cableveyor radius: 75 mm

#### 90° bending test

Number of bends: 6 million min.



Bending angle: ±90° Bending rate: Approx. 30 times/minute Roll radius: 60 mm Load: 500 g

#### • IEC 61076-2-101 Compliant M12 Connector Pinout Diagram (from Mating Side) Coding refers to the shape of the connector mating part, which prevents incorrect mating.

The mating shape of M12 connectors for Ethernet is D-coding.



### Specifications

	Туре	M12	RJ45 (including RJ45/M12 Connector cable type)	M12 Connectors for Panel Mounting			
Item	Model	XS5H-T42□-□M0-K XS5W-T42□-□M1-□□ XS5W-T42□-□M2-□□ XS5W-T42□-□M3-□□	XS5W-T42MC XS5W-T42MD XS5W-T42ME XS6G-T421-1	XS5P-T42⊡-5 XS5P-T426-1			
Rated current		3 A	2.5 A	4 A			
Rated voltage *1		30 VDC	125 VDC				
Contact resistance		40 mΩ max.					
Insulation resistance		1,000 MΩ min.	500 MΩ min.	1,000 MΩ min.			
Withstand voltage		1,000 VAC for 60 s (leakage current: 1 mA	1,500 VAC for 60 s (leakage current: 1 mA max.)				
Ambient operating te	mperature	-25 to 70°C *2					
Ambient storage tem	perature	–25 to 70°C					
Protective structure		M12: IEC IP67, RJ45: IEC IP20					

\*1. Voltage varies by installation environment.
\*2. Use robot cable within a temperature range of 0 to 70°C to avoid wire breakage when moving.

#### **Materials and Finish**

#### Connectors

	Туре		RJ45									
Item	Model	XS5H/W-T	XS5P-T42□-5	XS5W-T and XS6G								
Contact blocks		PBT resin PA resin										
Contacts		Sopper alloy/Gold plating										
Anchors	Zinc alloy/Nickel plating											
Anchors (tabs)		Stainless	tainless									
Shield		Stainless										
Cover		PBT resin										
Sealing resin			Epoxy resin									
O-rings		Rubber		•								
Grounding fixture				Copper alloy/Tin plating								
Anchor cover				Stainless								
Nuts			Copper alloy/Nickel plating	plating								

#### Cables

Model	Standard Cable	Robot Cable	Shield Strengthening Model (Standard Cable)						
Compliant standard	UL CM								
Category	Cat5e								
Core/color	AWG22 (7/0.26): Yellow · Orange · White · Blue	G22 (7/0.26):     AWG22 (7/24/0.05):       Iow · Orange · White · Blue     Yellow · Orange · White · Blue							
Outer diameter*1 6.5 dia.									
Sheath color*2	*2 Light blue, Yellow Black								
Sheath material PVC									
Shield structure	Icture Double shield								





#### ● Cable with Plug on One End and Socket on Other End (M12 Straight/RJ45) XS5W-T421-□ME-K



Wiring

20







● Cable with Plugs on Both Ends (M12 Right-angle/RJ45) XS5W-T422-□MC-K







-11.9

-2.5

500

10±

Orange

(20)

White

Yellow

Mounting Hole Dimensions Mounting Hole Dimensions

22.1

PG9

2.8

10.5

XS5P-T427-5 (Front Locking)

13.9<sup>'</sup> dia

**Panel Cutout Dimension** 



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

#### • M12 Panel-mounting PCB Straight Terminals XS5P-T426-1

20

(Socket)

18

(Socket)

M12 × 1



### **Assembly Procedure**

# • RJ45 Assembly Connectors XS6G-T421-1

- 1. Pass the cable through the cable clamp and the connector housing
- 2. Strip the cable sheath and ground braiding to the correct lengths.
- 3. Follow the color codes and prepare to insert the wires into the splice piece.
- 4. Insert the wires into the splice piece for the length of the splice piece.
- 5. Place the splice piece into the RJ45 data module and engage it.
- Place the data module and the splice piece on the IDC assembly housing.
- Press the data module and the IDC assembly housing together and use pliers or a similar device to make the insulation displacement contact.
- Remove the data module from the IDC assembly housing.
- Place the upper screen plate on the data module and press it over the ground braiding of the cable.
- Place the lower screen plate on the bottom of the data module, align it with the upper screen place, and latch it until you hear it click into place.
- 11. Slide the housing that you placed around the cable in step 1 up to the data module and latch it until you hear it click into place.
- 12. Tighten the cable clamp.

#### **Pin Assignments**

|--|

Function/Signal	Industrial Ethernet	EIA/TIA 568A	EIA/TIA 568B	Pin No.		
Transmission Data+/TD+	YE	WH/GN	WH/OG	1		
Transmission Data-/TD-	OG	GN	OG	2		
Receiver Data/RD+	WH	WH/OG	WH	3		
Receiver Data/RD-	BU	OG	GN	6		



















#### M12 Panel-mounting PCB Straight Terminals XS5P-T426-1

#### **Confirming the Number of Parts**

The following four parts are included in the package when it is delivered.

 Panel-mounting Parts
 PCB-mounting Part

 1. Anchor
 2. O-Ring
 3. Nut
 4. Connector



#### **Assembly Procedure**

#### 1. Mount the connector to the PCB.

2. Attach the anchor to the panel with the nut.

Mounting the Connector to the PCB Mounting the Anchor to the Panel





 Attach the connector that you mounted to the PCB to the panel.
 \* Make sure that the connector and anchor are oriented correctly. Attachment



4. Temporarily mount the O-ring to the top of the connector at the mating surface.



5. Mate the Connector Waterproof Cover (XS2Z-22, sold separately) or the Partner Connector Plug (XS5H-T42 -- M0-K, sold separately) and press the O-ring to the O-ring position after mounting.



# Connector Waterproof Cover (Sold Separately) XS2Z-22



\* Tightening torque: 0.39 to 0.49 N·m

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### List of Main Types of Cables with Connectors

#### •XS6 Series

Connec both	ctors on ends	Cables	Sheath	Sheath	Cable			Madal number structure										
Connectors (1)	Connectors (2)	Cables	material	color	specifications	0.2	0.3	0.5	1	1.5	2	3	5	7.5	10	15	20	
			PUR	Yellow	Flexibility improved	20	30	50	100	150	200	300	500	750	1000	1500	2000	XS6W-6PUR8SS[]CM-YF
		Cat6A,		Blue	Standard	20	30	50	100	150	200	300	500	750	1000	1500	2000	XS6W-6LSZH8SS[]CM-B
RJ45 plug	RJ45 plua	AWG20X4Falls	LSZH	Yellow	Standard	20	30	50	100	150	200	300	500	750	1000	1500	2000	XS6W-6LSZH8SS[]CM-Y
1.10	1 3			Green	Standard	20	30	50	100	150	200	300	500	750	1000	1500	2000	XS6W-6LSZH8SS[]CM-G
		Cat5, AWG26×4Pairs	PUR	Green	Standard			50	100	150	200	300	500	750	1000	1500	2000	XS6W-5PUR8SS[]CM-G

Note. The numerals indicating the cable length as shown in the table are entered at the [...] position in the model number structure.

#### ● XS5□-T Series

Connec both	tors on ends	Cablaa	Sheath	Sheath	Cable	Cable length (m)									Model number structure														
Connectors (1)	Connectors (2)	Cables	material	color	color	color	specifications	0.3	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	10	15	20	25	30	35	40	45	50		
				Light blue	Standard	А	в	С		D		Е				G	J	к	L	т	N	z	Ρ	R	х	XS5W-T421-[]MD-K			
RJ45 plug	RJ45 plug			Light blue	Flexible robot		в	С	Y	D	U	Е	v	F	w	G	J	к	L	т	Ν				х	XS5W-T421-[]MD-KR			
				Yellow	Flexible robot		в	С		D		Е				G										XS5W-T421-[]MD-YR			
				Light blue	Standard	А	в	С	Y	D	U	Е	v	F	w	G	J	к	L	т	Ν				х	XS5W-T421-[]MC-K			
				Yellow	Standard	Α	В	С		D		Е				G										XS5W-T421-[]MC-Y			
RJ45	M12			Black	Standard		В	С		D		Е				G	J									XS5W-T421-[]MC-SS			
plug	Straight			Light blue	Flexible robot		в	С	Y	D	U	Е	v	F	w	G	J	к	L	т	Ν				х	XS5W-T421-[]MC-KR			
				Yellow	Flexible robot							Е				G	J	к	L	т						XS5W-T421-[]MC-YR			
RJ45 plug	M12 plug Right angle			Light blue	Standard	A	в	с	Y	D	U	Е	v			G	J	к								XS5W-T422-[]MC-K			
RJ45 plug	M12 socket Straight	Cat5e, AWG22	PVC	Light blue	Standard		в	с	Y	D	U	Е	v	F	w	G	J	к	L	т	N				х	XS5W-T421-[]ME-K			
		2Pairs		Light blue	Standard		в	С	Y	D	U	Е	V	F	w	G	J	к	L	т	Ν				х	XS5W-T421-[]M2-K			
				Yellow	Standard	Α	В	С	i	D		Е	1		1	G										XS5W-T421-[]M2-Y			
M12 plug	M12 plug			Black	Standard		В	С		D		Е				G	J									XS5W-T421-[]M2-SS			
Straight	Straight						Light blue	Flexible robot		в	С	Y	D	U	Е	v	F	w	G	J	к	L	т	N				х	XS5W-T421-[]M2-KR
				Yellow	Flexible robot			С		D		Е				G	J	к								XS5W-T421-[]M2-YR			
M12 plug Right angle	M12 plug Right angle			Light blue	Standard	A	в	с	Y	D		Е				G	J	к								XS5W-T422-[]M2-K			
M12	M12			Light blue	Standard			С		D																ХЅ5Ѡ-Т421-[]МЗ-К			
Straight	Straight						Yellow	Flexible robot		в																			XS5W-T421-[]M3-YR
M12	M12				Light blue	Standard		в	С	Υ	D	U	Е	v	F	w	G	J	к	L	т	Ν				х	XS5W-T421-[]M1-K		
Straight	g socket ght Straight		Light blue	Flexible robot		в	С	Y	D	U	Е	v	F	w	G	J	к	L	т	Ν				х	XS5W-T421-[]M1-KR				
-							· · · · ·		· · · ·				· · · · ·		· · · · ·														
Connec	tors on end	Cables	Sheath	Sheath	Cable	Cable length (m)							Model number structure																
Connectors (1)	Connectors (2)	mate	material	material	COIOP	specifications	0.3	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	10	15	20	25	30	35	40	45	50			
M12 plug Straight		Cat5e, AWG22		Light blue	Standard		в	С		D		Е				G	J	к								XS5H-T421-[]M0-K			
M12 plug Right angle		AWG22 P × 2Pairs	AWG22 × PVC 2Pairs	Light blue	Standard	A	в	с		D		Е				G	J	к								XS5H-T422-[]M0-K			

 angle
 21 and 21 and

### **Safety Precautions**

#### **Definitions of Precautions**

Precautions for Safe Use	These refer to actions that should be performed or refrained from in order to ensure safe product usage.						
Precautions for Correct Use	These refer to actions that should be performed or refrained from in order to prevent product breakage, malfunctioning, and negative effects to performance and functionality.						

#### Precautions for Safe Use

#### **Degree of Protection**

Do not use these products if their protective structures have deteriorated, such as swelling or breakage of housing and sealing components.

If products with deteriorated protective structures continue to be used, breakage or fire damage, etc., may occur.

#### **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.
- Use after confirming the direction of the polarity key groove. • Do not touch wiring with wet hands. Doing so may result in
- malfunction or breakage when the device is turned on.
- 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 operating the lock, always confirm that the Connector is connected.

- Do not use tools of any sort to mate the Connectors. Always use your hands.
- Pliers or other tools may damage the Connectors.
- When replacing the Connector, confirm that no foreign substances such as liquids or cutting oils are adhered to the connection surface of the Connector before connecting.

#### Disposal

Dispose of this product as industrial waste.

#### **Precautions for Correct Use**

- Do not use the Connectors in an atmosphere or environment that exceeds the specifications.
- Do not perform wiring while power is flowing. Doing so may result in electrical shock or device breakage.
- Do not use the Connectors in an environment where corrosive gases or high temperature/high humidity are present. Doing so may result in malfunctions such as connection/contact failures and corrosion.
- Do not pull excessively on the Connectors or cables.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.
- Install the Connectors in a location where they will not be stepped on, to prevent disconnection of the cables or damage to the Connectors. 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 attached during installation, or if the plug connector is not engaged, use a waterproof cover or dust cover to protect the mating surface of the connector.

#### Wiring

- Do not perform wiring in environments where the cable ends may be exposed to liquids such as water or cutting oils.
- Follow the wiring diagrams when wiring the cables. Confirm that connections are possible before use.
- Lay the cables so that external force is not applied to the Connectors. Otherwise, the degree of protection 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.

#### 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.

• If bending XS5H/W-T cable, ensure that the minimum bend radius is 40 mm.



• If bending XS6W-6LSZH/5PUR cable, ensure that the minimum bend radius is 25 mm.



• If bending XS6W-6PUR cable, ensure that the minimum bend radius is 52 mm.

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