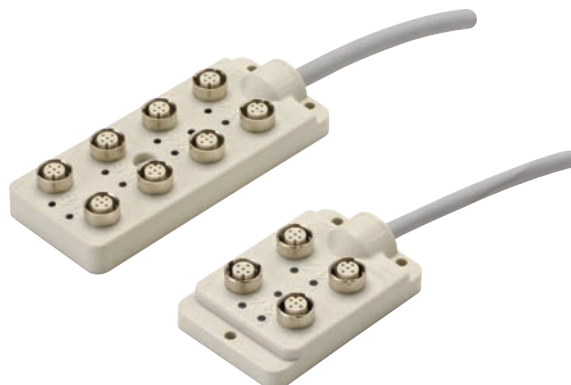# XW3D

Simple Wiring of Sensors, Limit Switches and Actuators

• Greatly reduce wiring in combination with the Smartclick XS5. Also improves maintenance efficiency.

• Features Smartclick connections that enable the connectors to be locked by simply inserting them and turning them approximately 1/8 of a turn.
A positive click indicates locking.

• Because these support Smartclick connections, attaching and removal of central ports (8-port type) is made easier.

• Higher rated current to enable output applications.

• Use previous M12 screw connectors.

⚠ **Refer to *Safety Precautions* on page 8.**

Smartclick

Model Number Structure

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

XW3D- **P** ☐ **5** ☐ - ☐ **11**
　　　　1　2　3　　4

1. No. of Ports	**3. Applicable Sensor Types, No. of I/O (each port)**	**4. Cable Length**
P4: 4	2: 2-wire DC, No. of I/O (each port) 1	G: 5 m
P8: 8	3: 3-wire DC PNP, No. of I/O (each port) 1	H: 7 m
	5: 3-wire DC NPN, No. of I/O (each port) 1	J: 10 m
2. Connector Poles	7: 3-wire DC PNP, No. of I/O (each port) 2	K: 15 m
No. of connector poles: 5	8: 3-wire DC NPN, No. of I/O (each port) 2	

Smartclick is a trademark or registered trademark of OMRON Corporation in Japan and other countries.
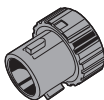
Ordering Information

Main Unit

No. of connector poles	Cable specifications	Circuits	Applicable sensor type	No. of connection ports	No. of I/O (each port)	Cable length (m)	Model
5	Standard cable (PVC)	PNP	3-wire DC	4	1	5	**XW3D-P453-G11**
						7	**XW3D-P453-H11**
						10	**XW3D-P453-J11**
				8	1	5	**XW3D-P853-G11**
						7	**XW3D-P853-H11**
						10	**XW3D-P853-J11**
						15	**XW3D-P853-K11**
				4	2	5	**XW3D-P457-G11**
						7	**XW3D-P457-H11**
						10	**XW3D-P457-J11**
		NPN	3-wire DC	4	1	5	**XW3D-P455-G11**
				8	1	5	**XW3D-P855-G11**
				4	2	5	**XW3D-P458-G11**
		PNP/NPN	2-wire DC	4	1	5	**XW3D-P452-G11**
				8	1	5	**XW3D-P852-G11**

Accessories (Sold Separately)
Waterproof Cover

Appearance	Model	Material	Remarks
	XS5Z-11	PBT	The Waterproof 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. XS5Z-11 is Smartclick mechanism. There's no need to keep track of locking torque.
	XS2Z-22	Brass with Ni plating	

Note 1. The XW3D comes with a dust cover.
　　　　If IP67 degree of protection is required, use the XS5Z-11 or XS2Z-22 (sold separately).
　　　2. The XS2Z-22 connection is threaded.

Ratings and Specifications

Rated current	4 A/port, 12 A/Box (power line)
Rated voltage	10 to 30 VDC
Contact resistance (connector)	40 mΩ max. (20 mV max. and 100 mA max.)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength (connector)	500 VAC for 1 min (leakage current: 1 mA max.)
Degree of protection	IP67 (IEC60529)
Insertion tolerance	50 times min.
Lock strength	Pulling: 100 N/15 s, Twisting: 1 N·m/15 s
Cable holding strength	100 N/15 s
Lock operating force	0.1 to 0.25 N·m
Ambient operating temperature range	−25 to 70°C
Ambient humidity range	25% to 85%

Materials and Finish

Item	Model	XW3D
Contacts	Material	Brass
	Finish	Nickel base, 0.4-μm gold plating
Fixtures	Material	Zinc alloy
	Finish	Nickel plated
Case		PBT resin (UL94V-0), light gray
Bushing		Rubber
O-ring		Rubber
PCB		Glass epoxy board
Seal resin		Urethane resin (UL94V-0)
Cable		UL AWM2464 Signal lines: AWG22 Power and ground lines: AWG18

Connection Combinations

OMRON model No.		Smartclick Plug Connectors XS5H, XS5G, XS5W (plug end), XS5R (plug end)	M12 Plug Connectors XS2H, XS2G, XS2W (plug end), XS2R (plug end)
Connector Terminal Box	XW3D	◎	○

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

Pin Arrangement

Item	Poles	5 poles
DC	Female (socket) Contact end	

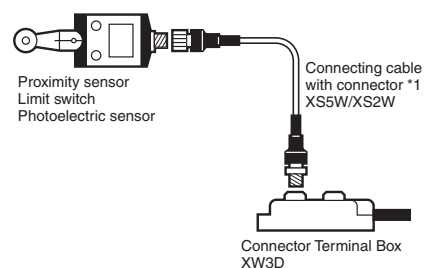Note: 4-pole connectors (plugs) can also be connected to the mating connector.

Connections

Table of Applicable Sensor Types and Connections for XW3D Models

Connector Terminal Box	Input device and connector terminal number					
	3-wire PNP 1 +, 3 -, 4 Output	3-wire NPN 1 +, 3 -, 4 Output	2-wire DC (with polarity) 1 +, 4 -	2-wire DC (with polarity) 3 -, 4 +	2-wire DC (without polarity) 3, 4	Limit switch (DC type)
XW3D-P□53-□11/ XW3D-P□57-□11	Available	Not available	Available	Not available	Not available	Not available
XW3D-P□55-□11/ XW3D-P□58-□11	Not available	Available	Not available	Available	Available	Available
XW3D-P□52-G11	Not available	Not available	Available	Not available	Available	Available

Note: Because connector pin No. 2 on the terminal box is empty, connection of NC-type input devices is not possible.

Example Connection Methods

M12 Direct Connection Type

Proximity sensor
Limit switch
Photoelectric sensor

Connecting cable with connector *1 XS5W/XS2W

Connector Terminal Box XW3D

M12 Connector-Terminal Connection Type

Proximity sensor
Limit switch
Photoelectric sensor

Connector Terminal Box XW3D

Pre-Wired Type

Proximity sensor
Limit switch
Photoelectric sensor

Connector assembly XS5G/XS2G *2

Connector Terminal Box XW3D
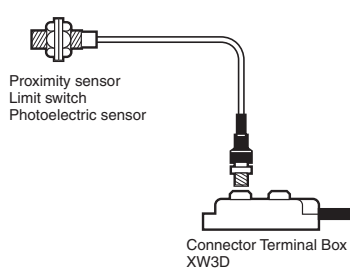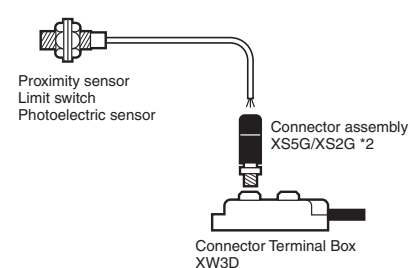
Note: If using an M8 connector type sensor, use XS3W-M42C-4C2-A for the XS3W (M8-M12) conversion cable and switch to an M12 connector.
*1. Connecting cable (straight on both ends) models XS5W-D421-□81-F (Smartclick connection type) and XS2W-D421-□81-F (M12 screw connection type)
    "□" is where the cable length is entered. C: 1 m, D: 2 m, E: 3 m, G: 5 m, J: 10 m
*2. IDC, crimping, soldering, and screw-on type connector assemblies are available for various types of connections. For details, refer to the data sheet for XS5/XS2.

XW3D and Input Device (Connector Type Sensor/Actuator) Connection Model List

Connector Terminal Box	Applicable sensor/ actuator types and connections *1			Applicable sensor/actuator models
XW3D-P□53-□11/ XW3D-P□57-□11	3-wire DC proximity sensor (PNP) 1 +, 3 -, 4 control output	Direct connection type	Shield type	E2E-X2F1-M1, E2E-X5F1-M1, E2E-X10F1-M1
			Non-shield type	E2E-X5MF1-M1, E2E-X10MF1-M1, E2E-X18MF1-M1
	Photoelectric sensor (PNP) 1 +, 3 -, 4 control output	Connector-terminal connection type *2	Through-beam type	E3Z-T81-M1J 0.3M E3Z-T81-M1TJ 0.3M
			Retro-reflective type	E3Z-R81-M1J 0.3M E3Z-R81-M1TJ 0.3M
			Diffuse-reflective type	E3Z-D82-M1J 0.3M E3Z-D82-M1TJ 0.3M
	Actuator wiring 3-4	Solenoid valves, etc.		
XW3D-P□55-□11/ XW3D-P□58-□11	3-wire DC proximity sensor (NPN) 1 +, 3 -, 4 control output	Direct connection type	Shield type	E2E-X2E1-M1, E2E-X5E1-M1, E2E-X10E1-M1
			Non-shield type	E2E-X5ME1-M1, E2E-X10ME1-M1, E2E-X18ME1-M1
	Photoelectric sensor (NPN) 1 +, 3 -, 4 control output	Connector-terminal connection type *2	Through-beam type	E3Z-T61-M1J 0.3M E3Z-T61-M1TJ 0.3M
			Retro-reflective type	E3Z-R61-M1J 0.3M E3Z-R61-M1TJ 0.3M
			Diffuse-reflective type	E3Z-D62-M1J 0.3M E3Z-D62-M1TJ 0.3M
	2-wire DC proximity sensor without polarity 3-4	Connector-terminal connection type	Shield type	E2E-X3D1-M1J-T, E2E-X7D1-M1J-T, E2E-X10D1-M1J-T
	Limit switch (DC type)	Connector-terminal connection type	—	WL□-□DK1EJ-N *3, WL□-□-M1GJ-N *3, D4C-□0□□-DK1EJ□ *4
		Direct connection type		WL□-□K13-N *3, D4E-□□10N *4
	Actuator wiring 1-4	Solenoid valves, etc.		
XW3D-P□52-□11	2-wire DC proximity sensor with polarity 1-4	Connector-terminal connection type *2	Shield type	E2E-X3D1-M1TGJ, E2E-X3D1-M1GJ, E2E-X7D1-M1TGJ, E2E-X7D1-M1GJ, E2E-X10D1-M1TGJ, E2E-X10D1-M1GJ
			Non-shield type	E2E-X8MD1-M1TGJ, E2E-X8MD1-M1GJ E2E-X14MD1-M1TGJ, E2E-X14MD1-M1GJ E2E-X20MD1-M1TGJ, E2E-X20MD1-M1GJ
		Direct connection type	Shield type	E2E-X3D1-M1G, E2E-X7D1-M1G, E2E-X10D1-M1G
			Non-shield type	E2E-X8MD1-M1G, E2E-X14MD1-M1G, E2E-X20MD1-M1G
	2-wire DC proximity sensor without polarity 3-4	Connector-terminal connection type	Shield type	E2E-X3D1-M1J-T, E2E-X7D1-M1J-T, E2E-X10D1-M1J-T
	Limit switch (DC type)	Connector-terminal connection type	—	WL□-□DK1EJ-N *3, WL□-□-M1GJ-N *3, D4C-□0□□-DK1EJ□ *4
		Direct connection type		WL□-□K13 *3, D4E-□□10N *4, D4CC-□□□□ *4

Note 1. Use XS5G/XS2G assembly connector models for pre-wired type input devices.
        Only main types are shown. Refer to the data sheets for each product for information regarding available proximity sensors and limit switches, as well as detailed specifications.
     2. Because connector pin No. 2 on the terminal box is empty, connection of NC-type input devices is not possible.
*1. The numbers shown are the terminal no. of connectors.
*2. Connector-terminal connection type photoelectric sensor E3Z-□-M1TJ 0.3M and proximity sensor E2E-□-M1TGJ have Smartclick connection specifications.
*3. Can only be used when a 1A contact is used.
*4. Only NO connection types can be used. NC types cannot be used.

Wiring Diagram

●Models with One I/O and One Port

PNP Sensor Specifications
3-wire DC PNP,
2-wire DC (with polarity 1-4),
and Actuator (3-4)

NPN Sensor Specifications
3-wire DC NPN,
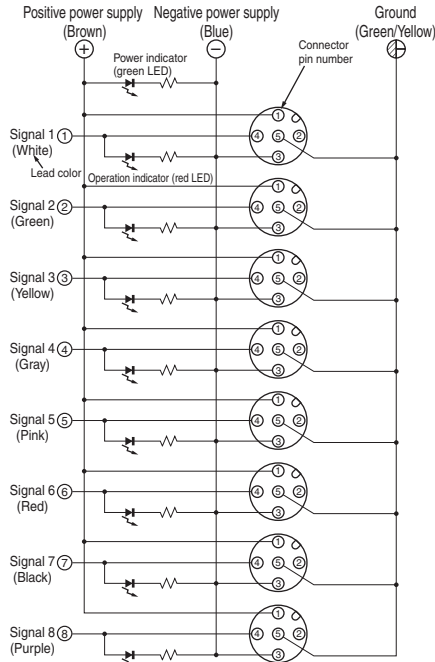**2-wire DC (with polarity 3-4/without polarity 3-4), and Actuator (1-4)**

2-wire Sensor Specifications
2-wire DC (with polarity 1-4/without polarity 3-4)

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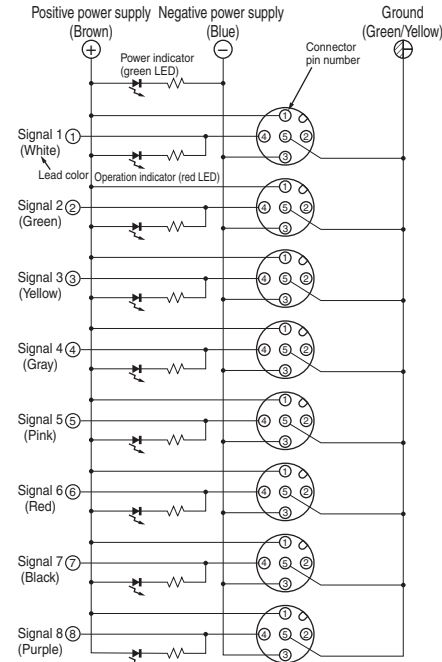Cannot be used with Proximity Sensors with polarity 3-4.

XW3D-P□53-□11 `3-WIRE PNP`

XW3D-P□55-□11 `3-WIRE NPN`

XW3D-P□52-□11 `2-WIRE`
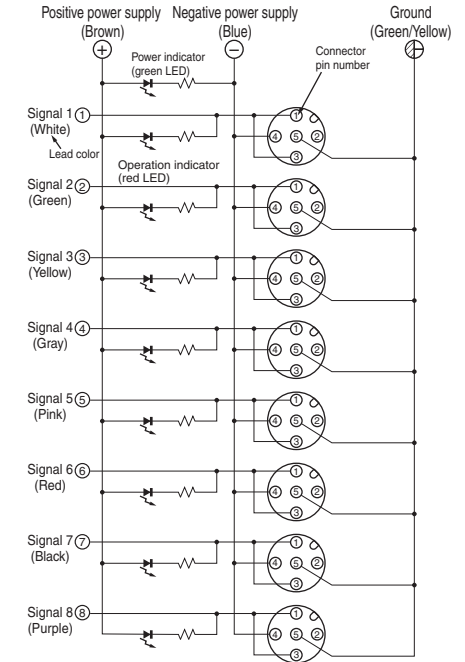
Note 1. The above wiring diagrams are for eight-port use.
2. Figures in parentheses indicate lead colors.
3. The expression "white/red" means white and red stripes.
4. Here, "1-4" and "3-4" represent terminal numbers.
5. Contact numbers 5 through 8 in the above wiring diagrams do not exist on Terminal Boxes with four ports.
The lead colors for signals 1 through 4, power supply, and ground are the same.

●Models with Two I/O and One Port

3-wire DC PNP,
Actuator (3-4 or 3-2)
XW3D-P457-□11 `3-WIRE PNP (2)`
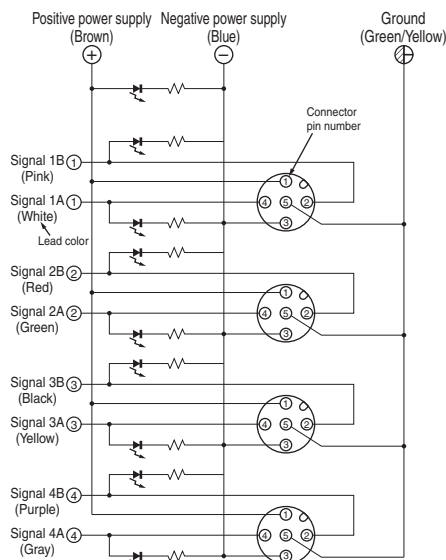
3-wire DC NPN,
Actuator (1-4 or 1-2)
XW3D-P458-□11 `3-WIRE NPN (2)`
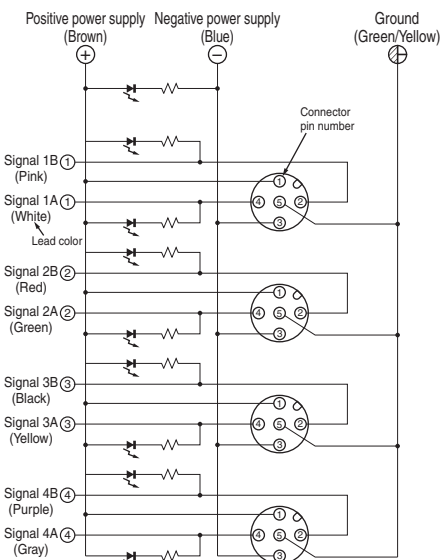
Note: Colors given in the connection diagram are lead colors.

Dimensions

(Unit: mm)

XW3D-P452-□11
XW3D-P453-□11
XW3D-P455-□11
(Model with Four Ports and One I/O)

Power indicator (green LED)
Operation indicator (red LED)
4.5 dia.
6.9 dia.
4.5 dia.
Indication of internal wiring

73
4.5
33
54
27
4.5 dia.
L (Cable length) *
100
10
120
9
27
30.5
82
9
6.5
13.5
9
20
9
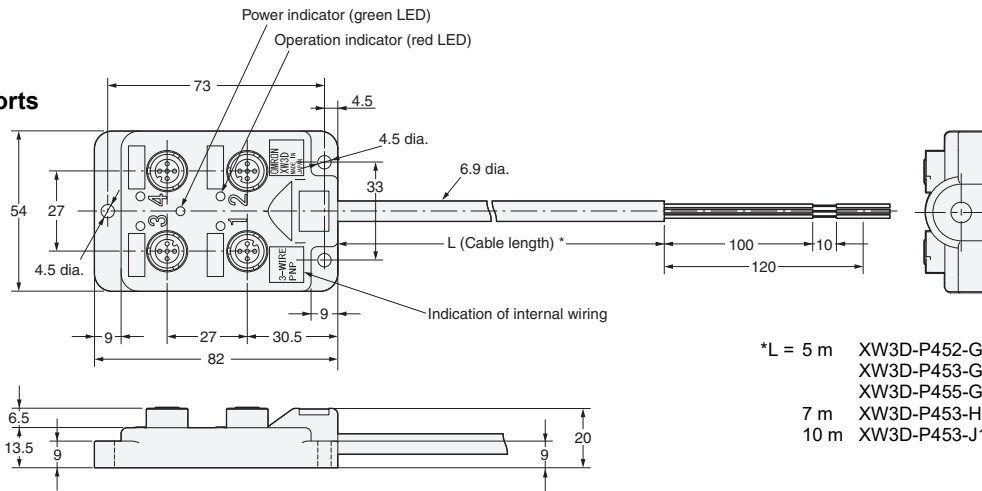
*L = 5 m   XW3D-P452-G11
            XW3D-P453-G11
            XW3D-P455-G11
     7 m   XW3D-P453-H11
    10 m   XW3D-P453-J11

XW3D-P852-□11
XW3D-P853-□11
XW3D-P855-□11
(Model with Eight Ports and One I/O)

Power indicator (green LED)
Operation indicator (red LED)
4.5 dia. 9 dia.
73
4.5
4.5 dia.
8.2 dia.
33
54
27
L (Cable length) *
100
10
120
27
27
27
30.5
9
127
Indication of internal wiring
6.5
13.5
9
20
9
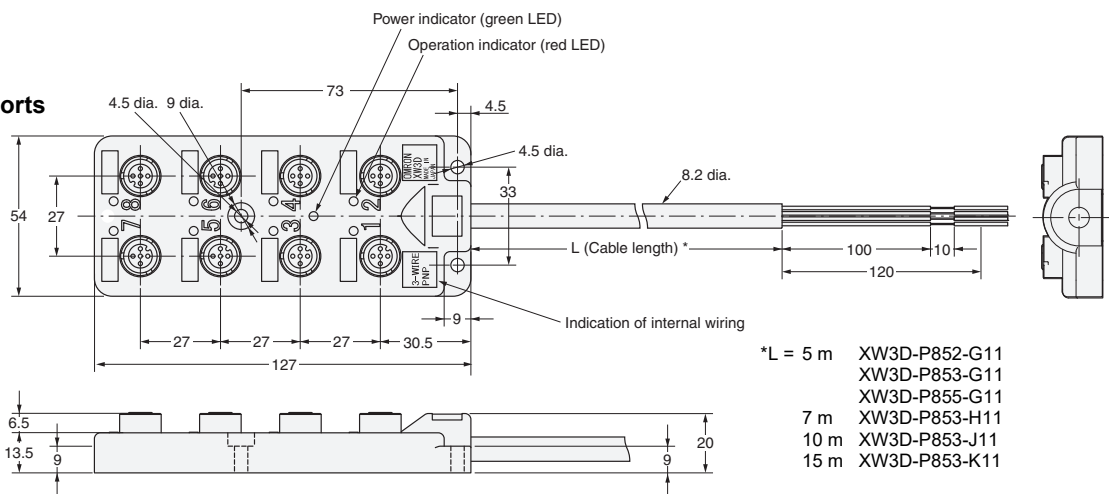
*L = 5 m   XW3D-P852-G11
            XW3D-P853-G11
            XW3D-P855-G11
     7 m   XW3D-P853-H11
    10 m   XW3D-P853-J11
    15 m   XW3D-P853-K11

XW3D-P457-□11
XW3D-P458-□11
(Model with Four Ports and Two I/O)

Power indicator (green LED)
Operation indicator (red LED)
73
4.5
4.5 dia.
8.2 dia.
33
54
27
4.5 dia.
L (Cable length) *
100
10
120
9
27
30.5
82
Indication of internal wiring
6.5
13.5
9
20
9
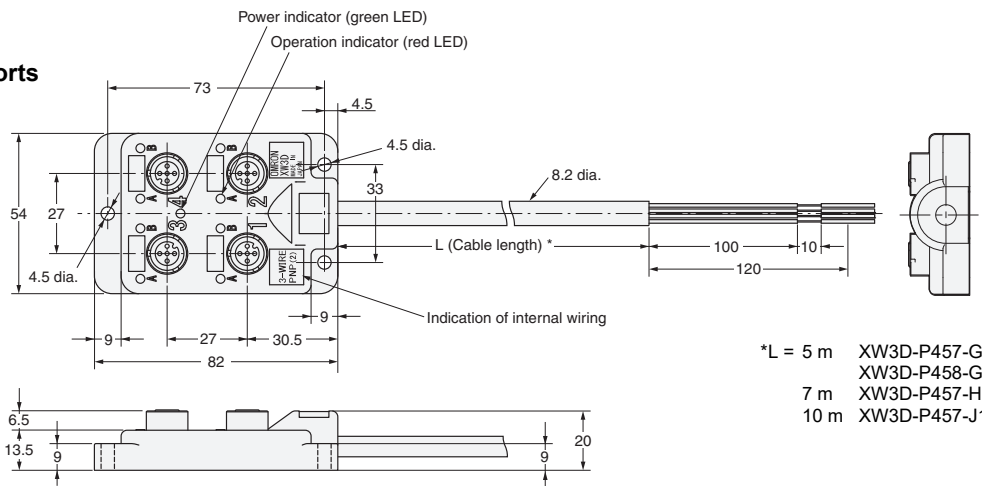
*L = 5 m   XW3D-P457-G11
            XW3D-P458-G11
     7 m   XW3D-P457-H11
    10 m   XW3D-P457-J11

Mounting Dimensions

3-M4 or 4.5 dia.
33±0.1
73±0.1
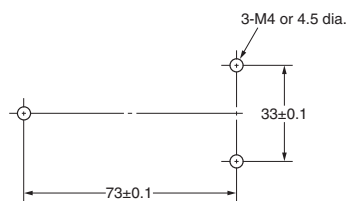
Note: The mounting dimensions are the same regardless of the number of ports.

Safety Precautions

Precautions for Correct Use

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

Connector Connection and Disconnection

- Mate the Connectors by following the XS5 connector mating procedure.
- When mating Connectors, be sure to insert the plug all the way to the back of the socket before attempting to lock the Connectors.
- Do not use tools of any sort to mate the Connectors. Always use your hands. Pliers or other tools may damage the Connectors.
- When mating the Connectors to XS2 or other M12 Connectors, tighten the lock by hand to a torque of 0.39 to 0.49 N·m.
- Confirm in the catalog that sensors and actuators are applicable before using them.
- Always turn OFF the power supply before connecting or disconnecting connectors.
- Do not touch the mating surface of the connectors with wet hands.
- Wipe away any water around the connectors.
- Do not allow metal scraps or dust to enter the mating section.

Cable Lead Polarity

- Wire as in the wiring diagram so that the polarities of cable cores (blue: negative power supply, brown: positive power supply) are wired correctly.
- If the polarity is not correct, the load may not operate or the operation indicator may not light.
- Always connect a load to the signal lines to operate a sensor or actuator.

Suitable Connectors

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

Power Supply and Operation Indicators

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

| 3-WIRE NPN | 2-WIRE | 3-WIRE PNP | 3-WIRE NPN (2) | 3-WIRE PNP (2) |

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In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

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