

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.



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 \square 5 \square - \square 11
1 2 3 4

1. No. of Ports

P4: 4
 P8: 8

2. Connector Poles

No. of connector poles: 5

3. Applicable Sensor Types, No. of I/O (each port)

2: 2-wire DC, No. of I/O (each port) 1
 3: 3-wire DC PNP, No. of I/O (each port) 1
 5: 3-wire DC NPN, No. of I/O (each port) 1
 7: 3-wire DC PNP, No. of I/O (each port) 2
 8: 3-wire DC NPN, No. of I/O (each port) 2

4. Cable Length

G: 5 m
 H: 7 m
 J: 10 m
 K: 15 m

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-resistant Cover to a Connector, be sure to apply a torque range between 0.39 and 0.49 N·m to tighten the Water-resistant 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 | M12 Plug Connectors |
|------------------------|------|--|--|
| | | XS5H, XS5G, XS5W (plug end), XS5R (plug end) | 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

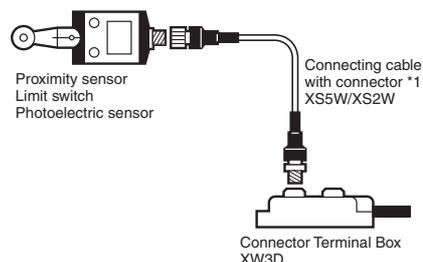
Table of Applicable Sensor Types and Connections for XW3D Models

| 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 |

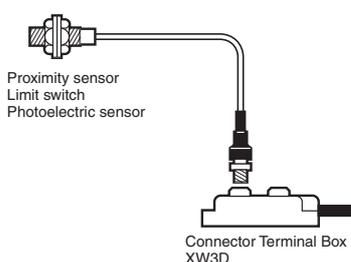
Note: Because connector pin No. 2 on the terminal box is empty, connection of NC-type input devices is not possible.

Example Connection Methods

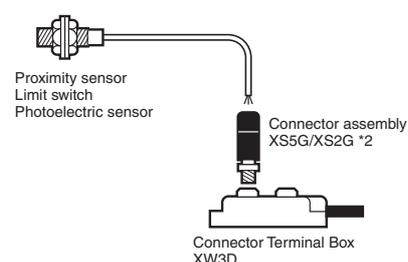
M12 Direct Connection Type



M12 Connector-Terminal Connection Type



Pre-Wired Type



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)

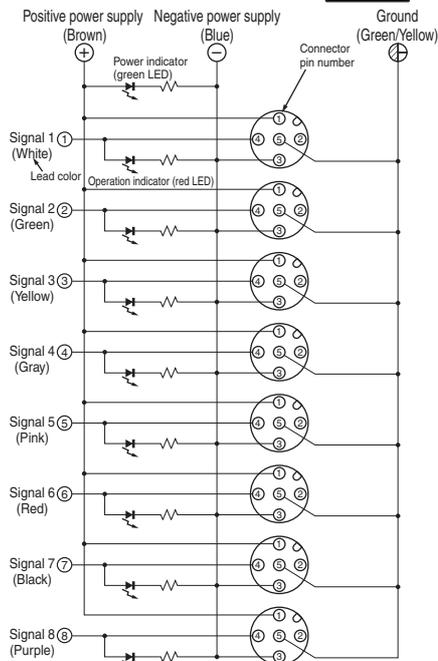
2-wire Sensor Specifications

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.

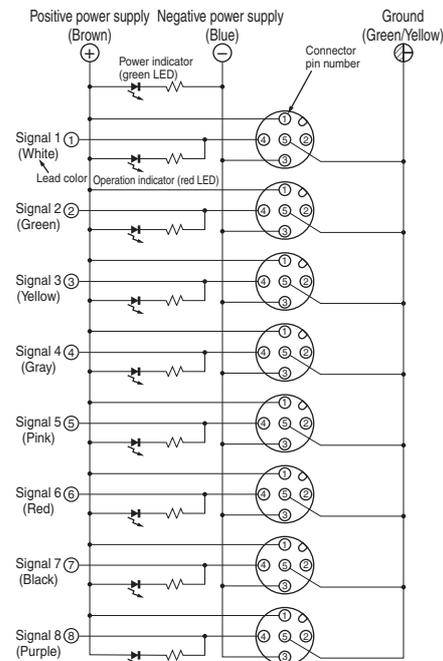
XW3D-P□53-□11

3-WIRE
PNP



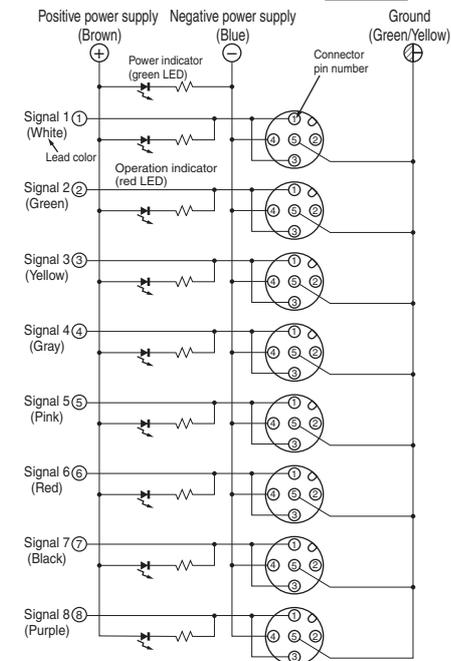
XW3D-P□55-□11

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.

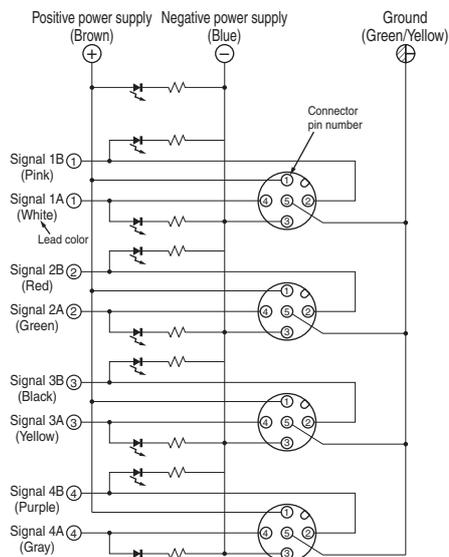
5. Contact numbers 5 through 8 in the above wiring diagrams do not exist on Terminal Boxes with four ports.

The lead colors for signals 1 through 4, power supply, and ground are the same.

●Models with Two I/O and One Port

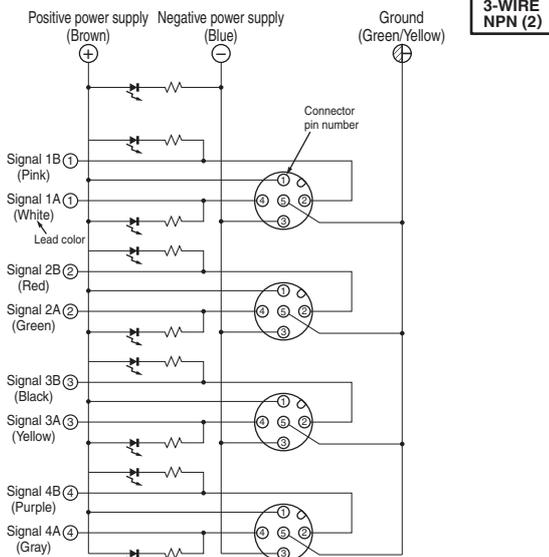
3-wire DC PNP, Actuator (3-4 or 3-2)

XW3D-P457-□11



3-wire DC NPN, Actuator (1-4 or 1-2)

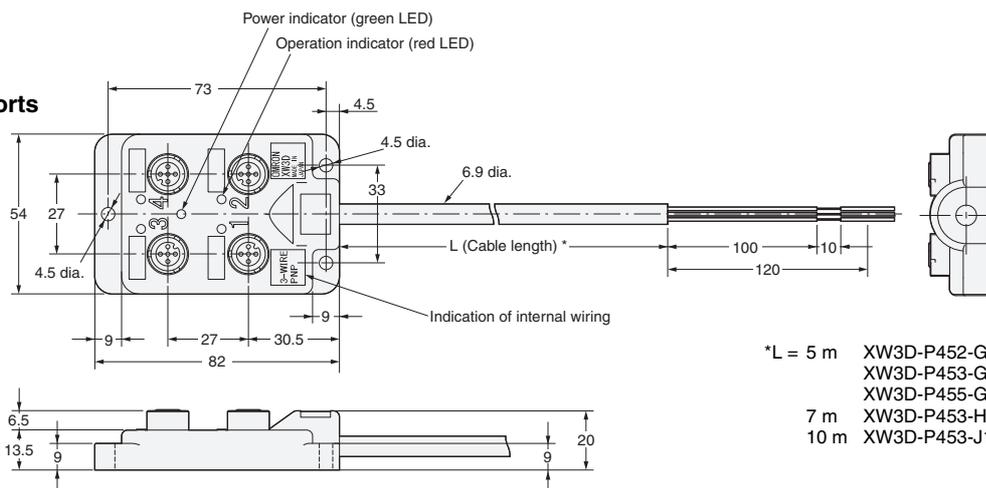
XW3D-P458-□11



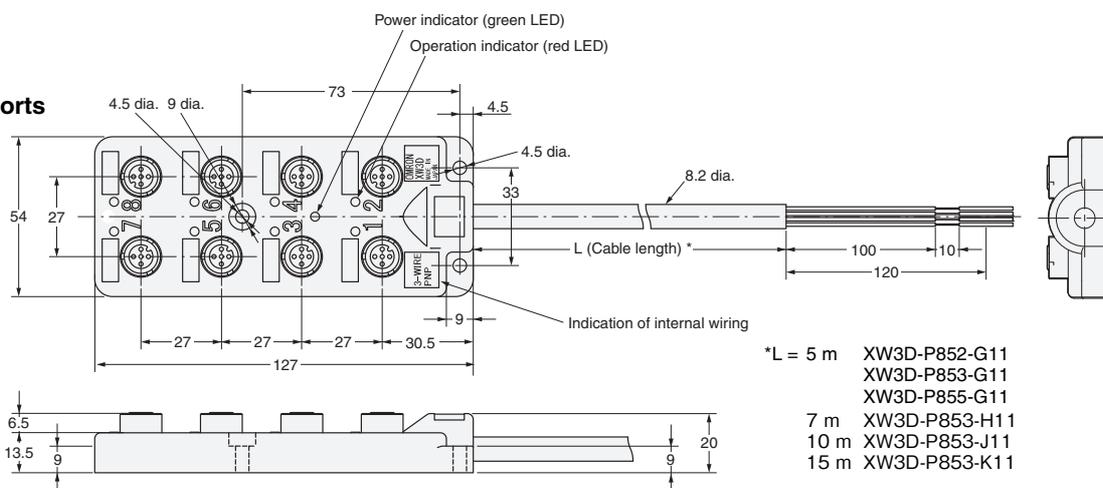
Note: Colors given in the connection diagram are lead colors.

Dimensions

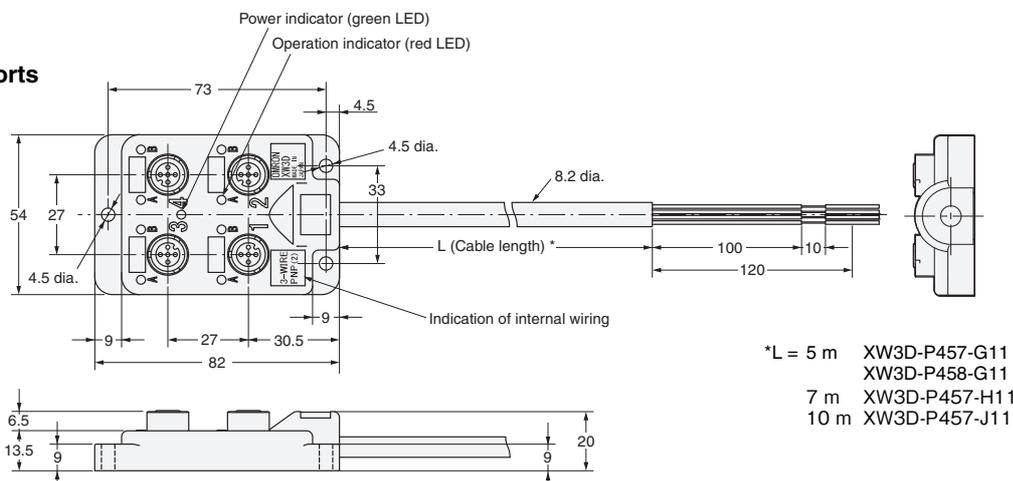
XW3D-P452-□11
XW3D-P453-□11
XW3D-P455-□11
(Model with Four Ports and One I/O)



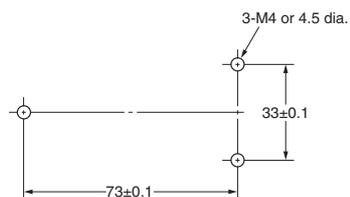
XW3D-P852-□11
XW3D-P853-□11
XW3D-P855-□11
(Model with Eight Ports and One I/O)



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



Mounting Dimensions



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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