

IoT Flow Sensors/IoT Pressure Sensors

E8FC/E8PC Series

Additional "temperature monitoring" feature that allows you to detect cooling and hydraulic pressure abnormalities quickly

Flow Sensor
E8FC

Pressure Sensor
E8PC



"Temperature" can also be monitored in the same allowing quicker detection of signs of abnormalities

For detecting signs of cooling abnormalities

Flow rate 

IoT Flow Sensor

E8FC

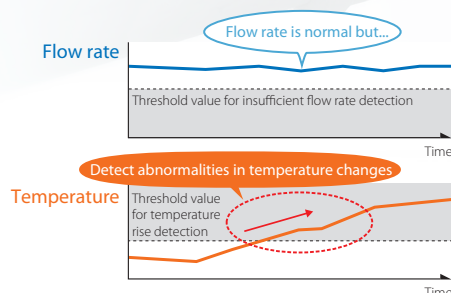
For detecting signs of hydraulic pressure abnormalities

Pressure 

IoT Pressure Sensor

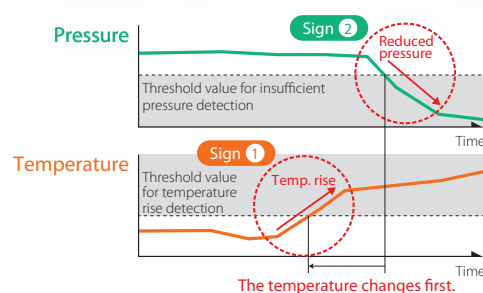
E8PC

Signs of cooling abnormalities detected with "temperature"



Even if the cooling water flow rate satisfies the conditions, if the water temperature is too high and it is not sufficiently cooled, manufacturing defects will occur. It is crucial to be able to monitor flow rate and temperature in the same position at the same time.

Signs of hydraulic pressure drops detected with "temperature"



Signs of hydraulic pressure drops are shown by rises in temperature. It is crucial to be able to monitor pressure and temperature in the same position at the same time.

position, than conventional methods

You can install the sensor without cutting the piping

You can replace pressure gauges and flow rate meters at the position where they are currently installed without cutting the piping. A wide variety of size conversion adapters are available, enabling easy replacement of existing sensors.



You can see the precise location of the abnormality with a glance

Even if the sensor is installed in dark locations or at the back of equipment at manufacturing sites, a high luminosity LED enables you to easily read the status. You can immediately tell which sensor is showing signs of abnormalities by the colors of the indicators.



You can also know when the sensor requires maintenance ahead of time

To ensure accurate monitoring of equipment states, the sensor performs self-diagnosis of its own status. It sends notification to a host device when signs of a connection error or a malfunction appears, so you can address problems before failures occur.

Diagnostic items during operations



- ☐ IO-Link communications status
- ☐ Internal system status of sensors
- ☐ Output load short circuit status

IoT Flow
Sensor

E8FC



Prevents sudden stops and
molding defects
due to cooling abnormalities

case
01

Welding machine

Problems

[Deformed welding tips and overheated transformers due to cooling performance degradation]

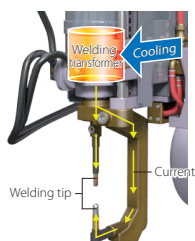
- If the cooling water temperature rises, the welding tip or welding transformer cannot be sufficiently cooled.
- If the welding tip gets overheated and deformed, welding defects occur.
- The welding transformer gets overheated, and the equipment suddenly stops.
- You cannot detect a temperature rise by monitoring temperature alone.

Solution from OMRON

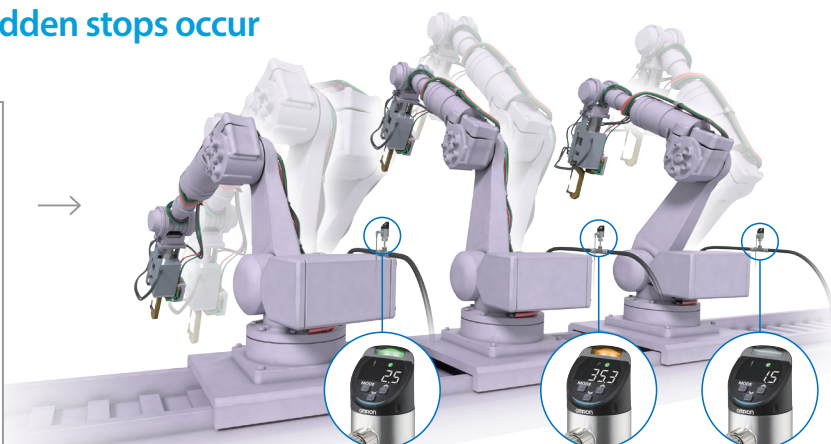


You can detect signs even before welding tip
deformation or sudden stops occur

Adverse effects of temperature rises

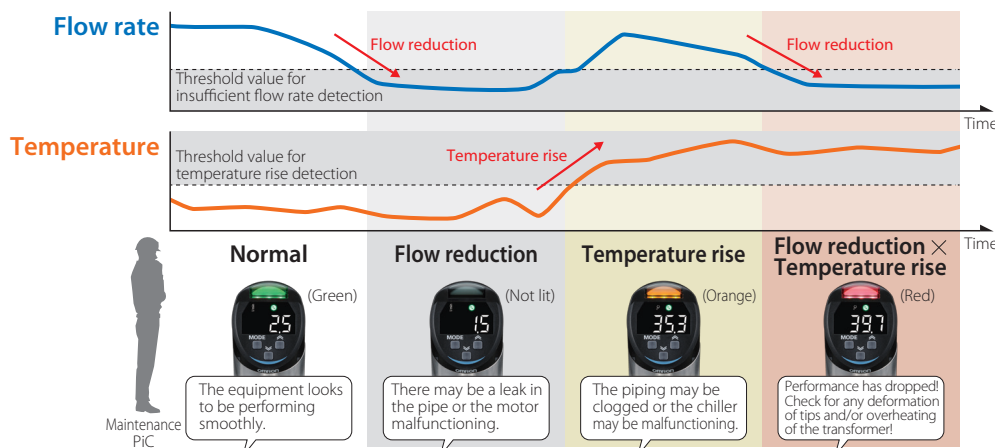


If cooling in the transformer where electric current flows to the welding tip is insufficient, the transformer gets overheated leading to deformation of the welding tip. In this case, monitoring both the cooling water "flow rate" and "temperature" is important.



You can simultaneously monitor whether the cooling water for the welder transformer has both a "optimum flow rate" and "optimum temperature", for continuous monitoring of the cooling water performance state. This enables to detect abnormality signs of equipment.

LED display for cooling performance



With the IoT Flow Sensor E8FC, you can simultaneously monitor the flow rate and temperature in the same position. Set these threshold levels, then the LED display indicates the statuses either individually or both the flow rate and temperature. You can "visualize" the status of the equipment, etc., with signs of abnormalities.



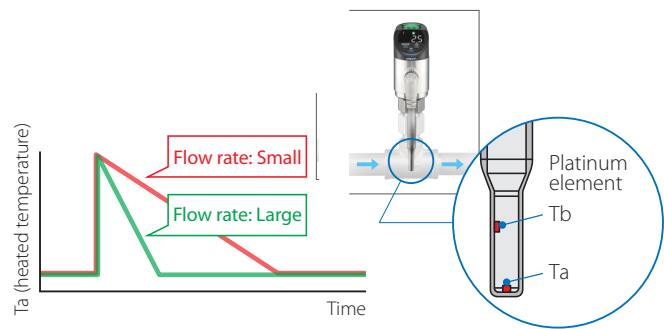
Multi-sensing technology

Flow rate

Uses the "Thermal flow rate measurement algorithm". Detect the flow velocity of the fluid by measuring how fast heat is taken from the pulse heated Ta (heated temperature measurement area), and performs flow rate calculations based on the pipe diameter.

Temp.

Uses the platinum element in Tb (liquid temperature measurement area) to directly measure the liquid temperature.



case
02

Molding machine

Problems

[Molding defects due to cooling performance degradation]

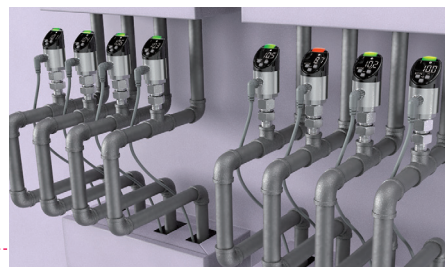
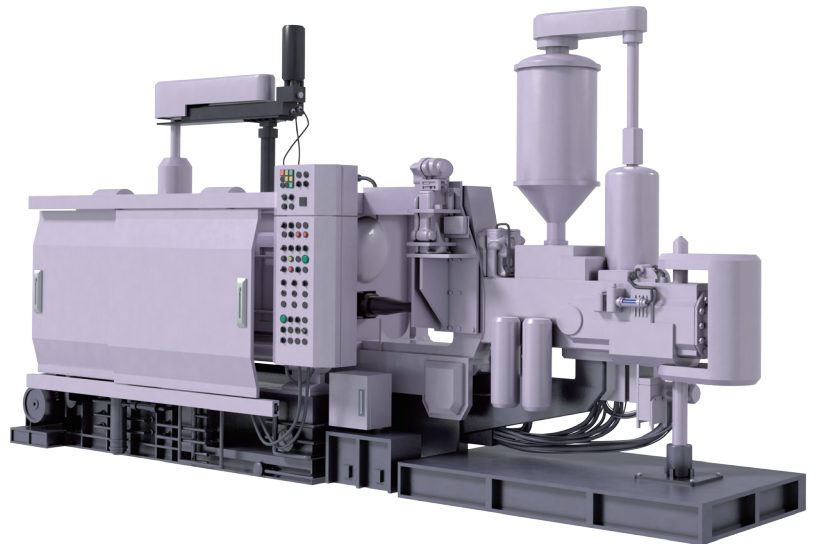
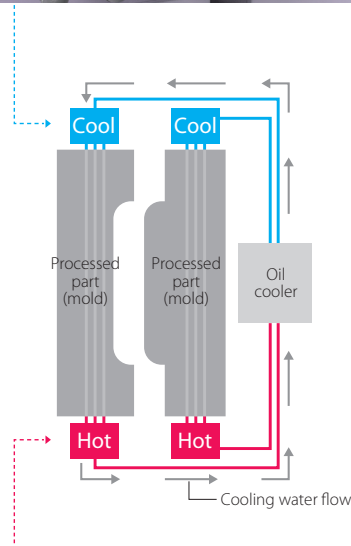
- Even if the amount of cooling water is adequate, a rise in water temperature leads to a drop in cooling performance.
- If the cooling performance declines, the processed part on the mold cannot be adequately cooled, resulting in deformation, voids, or other molding defects.
- You cannot detect a temperature rise by flow rate monitoring alone.



You can detect signs of cooling performance degradation even before occurrence of molding defects.

Monitor the "flow rate" and "temperature changes" in the same position, and quantify the optimum ranges for flow rate and temperature. You can detect signs of cooling performance degradation without relying on the experience or skills of maintenance personnel.

In addition, by mounting sensors on multiple pipes, you can quickly tell from the sensor LEDs what abnormality has occurred, in which pipe.



Solution from OMRON

IoT Pressure
Sensor**E8PC**

Prevents press defects and
processing defects
due to hydraulic pressure abnormalities

case
03

Pressing machine

Problems

[Press quality defects due to rises in hydraulic oil temperature]

- Rising temperatures reduce the viscosity of the hydraulic oil.
- Hydraulic pressure reduction leads to inconsistent press quality.
- You cannot detect a temperature rise by pressure monitoring alone.

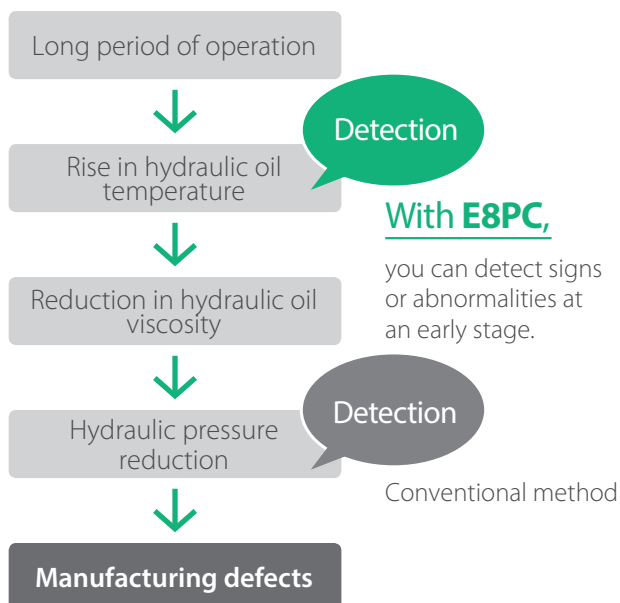
Solution from OMRON



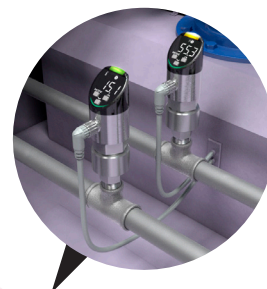
**You can use signs of press
pressure reduction to
prevent the occurrence of
product defects**

With temperature monitoring, you can detect signs of abnormalities that can cause reductions in hydraulic oil viscosity. With simultaneous monitoring of temperature and pressure in the same position, you can quantify the optimum ranges for temperature and oil pressure without relying on the experience or skills of maintenance personnel.

Steps until occurrence of manufacturing defects



Conventional method





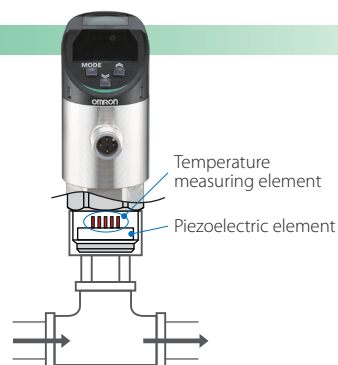
Multi-sensing technology

Pressure

Uses a piezoelectric element. Since the sensing surface is made of a high-hard ceramics, it withstands high pressure.

Temp.

Uses a temperature measuring element to measure the liquid temperature transmitted to the piezoelectric element. Uses a unique algorithm to estimate the temperature more accurately.



case
04

Machining center

Problems

[Tool gripping force declines due to hydraulic oil leak]

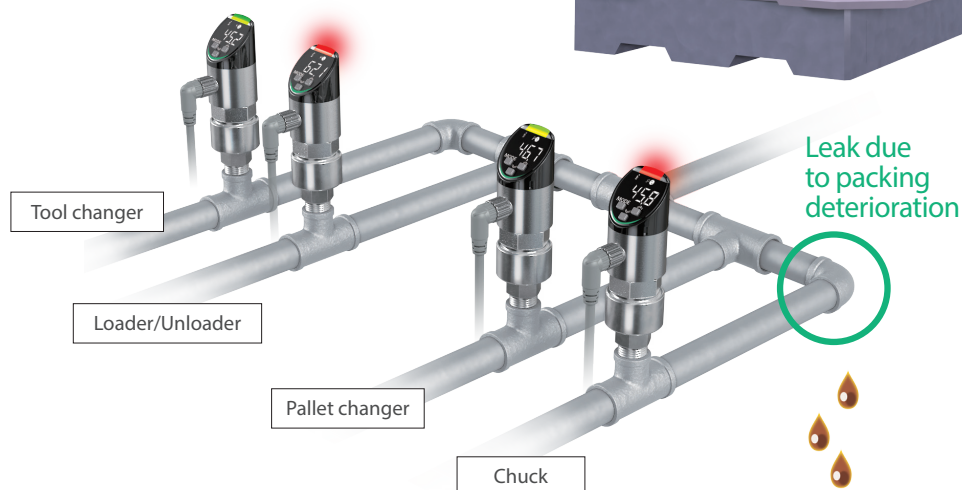
- Hydraulic oil temperature rises with repeated tool changes.
- Pipe packing deteriorates, resulting in hydraulic oil leak.
- Oil pressure reduction causes reduction in processing quality.
- The hydraulic pressure system is divided into multiple sections, so finding degraded packing locations takes time.



You can use a rise in hydraulic oil temperature to detect signs of hydraulic oil leak

You can monitor hydraulic oil temperature changes to understand how much of a rise in temperature will have an effect on packing degradation.

By mounting sensors on multiple pipes, you can quickly tell from the sensor LED displays what abnormality has occurred, in which pipe.



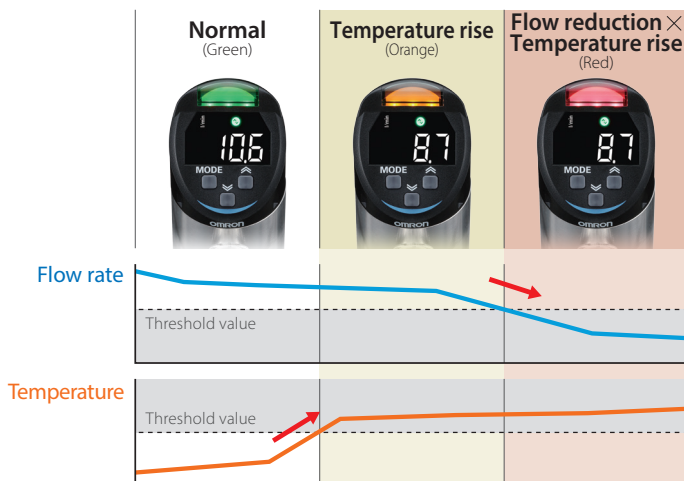
Notifications of changes in the cooling water or hydraulic oil states are easy to understand

You can see the cause of the abnormality

Multi-sensing display Patent pending

The sensor judges by monitoring "Flow rate + Temperature" and "Pressure + Temperature". Since data outputs to a PLC by the IO-Link communications is possible, it is easy to perform maintenance before entering an abnormal state. For the display colors, you can set 3 patterns, or if combined with Not lit, a total of 4 patterns.

■ Example of performance monitoring using IoT Flow Sensor



You can see the rate of change with a percentage

Relative value display E8FC

With the flow rate at the time of setting as 100%, you can relatively measure the change in flow rate value. Smart Tuning function is convenient for cases where optimum value management of absolute values is difficult, such as when the operating environment is changing, and liquid types are changing, etc.

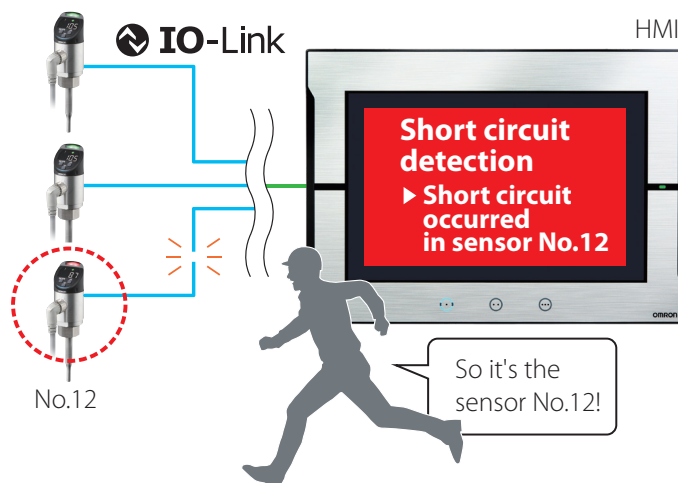


You can also see the sensor status

Self-diagnostic outputs



Self-diagnoses the sensor's own status, and autonomously sends notification when signs of a connection error or a malfunction appears.



Diagnostic items during operations

- ☐ IO-Link communications status
- ☐ Internal system status of sensors
- ☐ Output load short circuit status

Easy to see High luminosity LED display

A high luminosity LED gives good visibility even at the back of equipment or in dark locations.

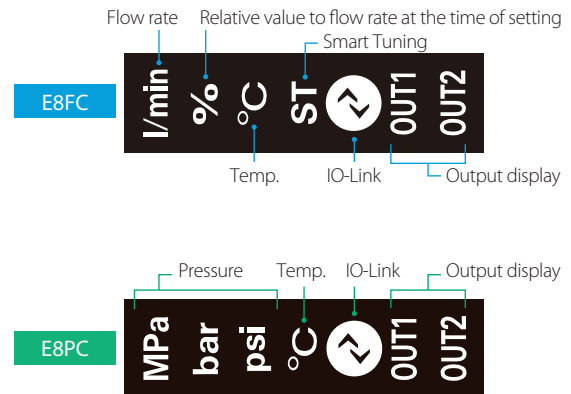
White digital display is easy to read even from a distance.

Condition indicator is easy to read even from the opposite side.



Easy to understand Display by unit

Converts to physical quantity units for display.



Adjust the angle according to the mounting position

Angle adjustment up to 330°

After fastening to the adapter, you can adjust the angle so that the display is easy to see.



180° reverse display

The display can rotate 180°.



Easy to use in various location

Compact and space-saving

You can even mount in narrow spaces with multiple pipes arrayed.

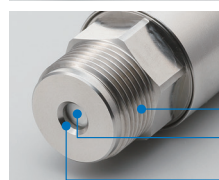


Highly durable liquid contact part



E8FC

Detecting unit: SUS304L
O-ring: FKM



E8PC

Pressure port: SUS304
Diaphragm pressure port: Al₂O₃ (alumina)
O-ring: FKM

Easy-to-clean structure

Structure is easily removable from the piping for periodic inspections, etc., and easily cleaned.



Direct setting

Button on the body for quick setting. After setting, you can use the key lock function to prevent operation in error.

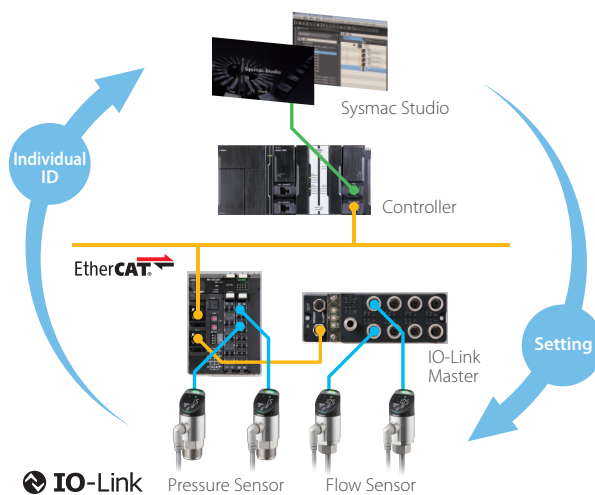


- | | |
|---|--|
| <input type="checkbox"/> Response time | <input type="checkbox"/> Threshold settings (hysteresis width) |
| <input type="checkbox"/> Timer setting | <input type="checkbox"/> Zero-cut setting |
| <input type="checkbox"/> Flow rate/Pressure ↔ Temperature display switching | <input type="checkbox"/> Setting initialization, etc. |

Batch setting from host devices



During maintenance, the settings must be the same conditions as when the product was initially mounted. If you use the IO-Link function, you can perform batch setting from a host device. You can manage by quantifying the adjustment that is performed by skilled personnel to avoid affecting the manufacturing quality.



Expanded cable and adapter lineups (sold separately)*



* Use our dedicated adapters. In addition, if there is a possibility of pulsations or vibrations to a Pressure Sensor, we recommend the attachment of a throttle (sold separately).

IoT Flow Sensors

E8FC

Detect Signs of Abnormalities in Cooling Water by Simultaneous Measurement of “Flow Rate + Temperature”

- Multi-sensing of “Flow rate + temperature” for preventing a sudden stops or manufacturing defects.
- Various lineup of replacement adapters to enable easy replacement of your current pressure gauges and flow meters.
- Analog current output function in addition to the IO-Link communications function that can perform self-diagnosis of abnormalities in the sensor itself.



Refer to *Safety Precautions* on page 19.



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

Ordering Information

Sensors [Refer to *Dimensions* on page 21.]





| Appearance | Applicable fluid * | Control output | Communication method | IO-Link baud rate | Model |
|------------|-----------------------|----------------|----------------------|-------------------|-----------------|
| | Liquid | PNP | IO-Link Analog | COM2 (38.4 kbps) | E8FC-25D |
| | | | | COM3 (230.4 kbps) | E8FC-25T |
| | | NPN | Analog | --- | E8FC-25 |

Note: Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

* The applicable fluid is a liquid that does not erode the wetted part materials (for example, water or a fluid whose conductivity is equivalent to that of water).

Adapters [Refer to Dimensions on page 21.]

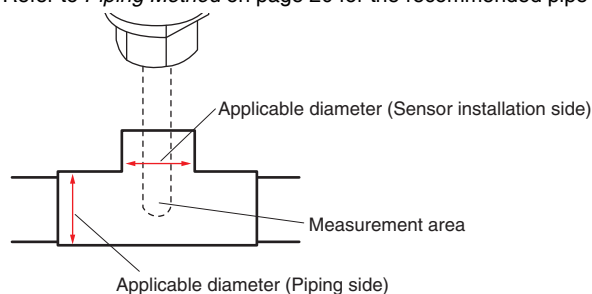
It must be selected from the adapters below.

| Appearance | Applicable diameter * | | Thread type | Materials | Model |
|---|-----------------------|--------------------|--------------------|-----------|--------------|
| | Nominal diameter A | Nominal diameter B | | | |
|  | 10 A | 3/8" | R (taper thread) | SUS304 | E8FC-YA-R10A |
| | | | NPT (taper thread) | | E8FC-YA-N10A |
|  | 15 A | 1/2" | R (taper thread) | | E8FC-YA-R15A |
| | | | NPT (taper thread) | | E8FC-YA-N15A |
|  | 20 A | 3/4" | R (taper thread) | | E8FC-YA-R20A |
| | | | NPT (taper thread) | | E8FC-YA-N20A |
|  | 25 A | 1" | R (taper thread) | | E8FC-YA-R25A |
| | | | NPT (taper thread) | | E8FC-YA-N25A |

* It is recommended that the piping fitting diameters be theme on both the piping side and the sensor mounting side.





Because the sensor is designed so that the measurement area is in the center of the piping, correct measurement may not be possible with different diameter fittings.

Refer to *Piping Method* on page 20 for the recommended pipe joint.



Cables (Sensor I/O Connectors)


A Cable is not provided with the Sensor. It must be ordered separately.

| Type | Appearance | Cable | Model |
|---------------------------------|---|-------|-----------------|
| Socket on one cable end |  | 2 m | XS5F-D421-D80-F |
| | | 5 m | XS5F-D421-G80-F |
| |  | 2 m | XS5F-D422-D80-F |
| | | 5 m | XS5F-D422-G80-F |
| Socket and plug on cable ends * |  | 2 m | XS5W-D421-D81-F |
| | | 5 m | XS5W-D421-G81-F |
| |  | 2 m | XS5W-D422-D81-F |
| | | 5 m | XS5W-D422-G81-F |

Note: Refer to *Sensor I/O Connectors/Sensor Controllers* on OMRON website for details.

* Straight type/L-shape type combinations are also available.

O-ring (for replacement) [Refer to Dimensions on page 22.]

| Appearance | Type | Model |
|---|--------------|-----------|
|  | For E8FC-25□ | E8FC-YL-1 |

Ratings and Specifications

Sensors

| | | | | | |
|--------------------------------------|--|--|---------------|-----------------|----------------|
| Model | PNP (COM2) | E8FC-25D | | | |
| | PNP (COM3) | E8FC-25T | | | |
| | NPN | E8FC-25 | | | |
| Applicable diameter | Nominal diameter B | 3/8" | 1/2" | 3/4" | 1" |
| | Nominal diameter A | 10 A | 15 A | 20 A | 25 A |
| Applicable fluid | | The fluid must not corrode the material of the wetted part (for example, water or a fluid whose conductivity is equivalent to that of water). | | | |
| Permissible pressure *1 | | 10 MPa | | | |
| Flow rate monitoring *2 | Rated flow rate range | 0.6 to 14 l/min | 1 to 30 l/min | 1.5 to 60 l/min | 2 to 100 l/min |
| | | Inner diameter setting (10 A, 15 A, 20 A, 25 A) | | | |
| | Display range | 0 to 16 l/min | 0 to 33 l/min | 0 to 66 l/min | 0 to 110 l/min |
| | Zero cutting flow rate *3 | 0.6 l/min | 1 l/min | 1.5 l/min | 2 l/min |
| | Display resolution (l/min) | 0.1/1 (Selectable) | | | |
| | Flow rate monitoring response time | Control output: 1.0, 2.5, 5, 10, 30, 60 s | | | |
| | Flow rate monitoring precision | ± (7.0% of measured value + 2.0% F.S.) or less | | | |
| | Flow rate repeatability / F.S. (prescribed for each response time) | 1 s: ±3.5%, 2.5 s: ±2.5%, 5 s: ±1.6%, 10 s: ±1%, 30 s: ±0.8%, 60 s: ±0.6% | | | |
| | Ambient temperature characteristics *4 | ±1.0% F.S./10°C | | | |
| Temperature monitoring *5 | Hysteresis | Variable | | | |
| | Temperature monitoring rated range | 0 to 85°C | | | |
| | Temperature monitoring precision | ±2.5°C | | | |
| Control output judgment (selectable) | Temperature repeatability | ±0.5°C | | | |
| | Standard mode | Judge if the measured value is the threshold value or more (or less). | | | |
| Display method | Window mode | Judge if the measured value is within the upper and lower limits. | | | |
| | | Numerical value indication: 4-digit 7-segment white LED with inverting function Status indicators: The content of indication is selectable from green, orange, red, and OFF. Output indicator: OUT1 operation (orange), OUT2 operation (orange) Unit indicator: l/min (White), % (White), °C (White), ST (White) Communication indicator: Lighting when communications are in progress (green) | | | |
| Delay setting | | 1 to 9999 ms (Select a function from invalid, ON delay, OFF delay, and one-shot.) | | | |
| Connection method | | M12, 4-pole connector type | | | |
| Output ch1 (selectable) | Control output | Flow rate control output (N.O./N.C.) E8FC-25D/-25T: PNP E8FC-25: NPN 30 VDC or less, Class 2, 100 mA max., residual voltage 1 V or less | | | |
| | Pulse output | 1/ 10/ 100/1000 l | | | |
| Output ch2 (selectable) | Control output | Flow rate control output (N.O./N.C.) / temperature control output (N.O./N.C.) E8FC-25D/-25T: PNP E8FC-25: NPN 30 VDC or less, Class 2, 100 mA max. residual voltage 1 V or less | | | |
| | Analog current output *7 | Flow rate analog output /temperature analog output Current output 4 to 20 mA (maximum load resistance 350Ω or less) (Display value ± 2% of F.S.) | | | |
| | Pulse output | 1/ 10/ 100/1000 l | | | |
| | External input | Smart tuning, One-point tuning, short-circuit current 1.5 mA or less, input time 20 ms or more | | | |

| | | |
|------------------------|------------------------------------|--|
| Model | PNP (COM2) | E8FC-25D |
| | PNP (COM3) | E8FC-25T |
| | NPN | E8FC-25 |
| IO-Link | IO-Link specification | Ver 1.1 |
| | Baud rate | E8FC-25D: COM2 (38.4kbps) E8FC-25T: COM3 (230.4Kbps) |
| | Data length | PD Size: 6 byte OD Size: 1 byte (M-sequence type: TYPE_2_V) |
| | Minimum cycle time | E8FC-25D (COM2): 3.2 ms E8FC-25T(COM3): 2.0 ms |
| Power supply | Power supply voltage | 15 to 30 VDC (including 10% ripple (p-p)), Class 2 |
| | Power consumption | 2,880 mW or less (When power supply voltage is 30 V, current consumption must be 96 mA or less. When power supply voltage is 15 V, current consumption must be 192 mA or less.) |
| Protection circuit | | Power supply reverse connection protection, output short-circuit protection, and output reverse connection protection |
| Environment resistance | Ambient temperature range | -20 to 80°C in operation and storage, respectively (no condensation) |
| | Applicable fluid temperature | 0 to 85°C (no icing on the pipe surface) |
| | Ambient humidity range | 35 to 85%RH in operation and storage, respectively (no condensation) |
| | Withstand voltage | 500 VAC 50/60 Hz 1min |
| | Vibration resistance (destruction) | 10 to 2000 Hz, double amplitude 1.5 mm, 2 hours in X/Y/Z direction each |
| | Shock resistance (destruction) | 500 m/s ² , three times in X/Y/Z direction each |
| | Protective structure | IP67 |
| | Pollution degree | 3 |
| | Altitude | 2,000 m or less |
| | Installation place | Indoor |
| Materials | Wetted part | Detecting unit: SUS304L, O-ring: FKM |
| | Other than wetted part | Head: PPSU, display unit: PES, button: PBT, chassis: SUS304L, nut: SUS304 |
| Weight | | Approx. 190 g |
| Accessories | | <ul style="list-style-type: none"> Ferrite core x 1 (TDK's Model ZCAT1 730-0730A) User's manual (Japanese, English, and Chinese), one each Compliance sheet Index list |

*1. Even instantaneous pressure fluctuation such as water hammer must be within the permissible pressure.

*2. The flow rate precision is defined based on the values measured in Omron's pre-shipment adjustment facility using water at the ordinary temperature (approx. 23°C).
In the ordinary temperature environment (approx. 23°C), install the product with the long side of the chassis holding unit toward the upstream of the pipe.
The measured value might vary due to fluid pulsation or pipe clogging.

*3. Cutting to zero is the function outputting the flow rate less than the minimum rated flow rate as zero.

*4. The ambient temperature characteristics are defined based on the values measured in the following environment using water at the ordinary temperature (approx. 23°C) flowing at 30 l/min.
In ordinary temperature environment (approx. 23°C) / pipe diameter 20A / straight pipe length 200 mm or more / recommended joint (KITZ's PTZ-20A) / dedicated adapter (E8FC-YA-R20A) / Install the product with the long side of the chassis holding unit toward the upstream of the pipe.

*5. The temperature precision is defined based on the values measured in the following environment using water.
In ordinary temperature environment (approx. 23°C) / pipe diameter 20A / straight pipe length 200 mm or more / recommended joint (KITZ's PTZ-20A) / dedicated adapter (E8FC-YA-R20A) / Install the product with the long side of the chassis holding unit toward the upstream of the pipe.

*6. If the pipe temperature exceeds 70°C, do not contact any cables with the pipe.

*7. Do not connect CH 2 (pin 2) with the IO-Link master unit in analog current output mode. Otherwise, the unit might fail.

I/O Circuit Diagrams

PNP output

| Model | Output mode | I/O Circuit Diagrams* | | |
|----------------------|------------------------------|-----------------------|---------------------|----------------------------|
| | | External input mode | Control output mode | Analog current output mode |
| E8FC-25D E8FC-25T | Standard I/O mode (SIO mode) | | | |
| | IO-Link mode | | | |

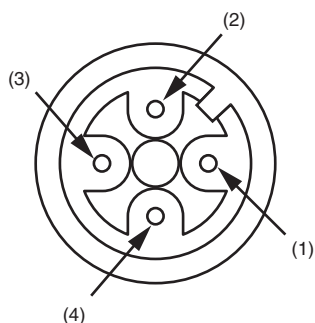
* Pin 2 input/output can be switched with either the operation buttons or the IO-Link communication command "Pin 2 switching mode selection".

NPN output

| Model | Output mode | I/O Circuit Diagrams* | | |
|---------|-------------|-----------------------|---------------------|----------------------------|
| | | External input mode | Control output mode | Analog current output mode |
| E8FC-25 | - | | | |

* Pin 2 input/output can be switched with the operation buttons.

Connector Pin Arrangement



Applicable connector code: XS5F / XS5W series

Applicable IO-Link master unit: NX/GX series

| Pin No. | E8FC-25D E8FC-25T | | E8FC-25 |
|---------|----------------------|---------------|---------------------|
| | Standard I/O mode | IO-Link mode | |
| (1) | +V | +V | +V |
| (2) | EXTIN/Analog/OUT2 * | Analog/OUT2 * | EXTIN/Analog/OUT2 * |
| (3) | 0 V | 0 V | 0 V |
| (4) | C/Q | C/Q | Q |

EXTIN: External input
Q: Control output
C: IO-Link communications

* Pin 2 input/output can be switched with either the operation buttons or the IO-Link communication command, "Pin 2 switching mode selection".

Timing Charts

The PNP output is described below by using the flow rate control output of OUT1 as an example.
The activity is the same even when temperature control output is selected in OUT2.

PNP output

| Model | Output mode | N.O./N.C. setting *1 | Timing charts *2 | |
|----------------------|---------------------------------|----------------------|--|---|
| | | | Standard mode | Window mode |
| E8FC-25D E8FC-25T | Standard I/O mode (SIO mode) | N.O. *3 | <p>Flow rate</p> <p>Threshold level</p> <p>Time</p> <p>Hysteresis</p> <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> | <p>Flow rate</p> <p>Threshold level.H</p> <p>Threshold level.L</p> <p>Time</p> <p>Hysteresis</p> <p>Hysteresis</p> <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |
| | | N.C. | <p>Flow rate</p> <p>Threshold level</p> <p>Time</p> <p>Hysteresis</p> <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> | <p>Flow rate</p> <p>Threshold level.H</p> <p>Threshold level.L</p> <p>Time</p> <p>Hysteresis</p> <p>Hysteresis</p> <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |
| | IO-Link mode | N.O. *3 | <p>Flow rate</p> <p>Threshold level</p> <p>Time</p> <p>Hysteresis</p> <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> | <p>Flow rate</p> <p>Threshold level.H</p> <p>Threshold level.L</p> <p>Time</p> <p>Hysteresis</p> <p>Hysteresis</p> <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |
| | | N.C. | <p>Flow rate</p> <p>Threshold level</p> <p>Time</p> <p>Hysteresis</p> <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> | <p>Flow rate</p> <p>Threshold level.H</p> <p>Threshold level.L</p> <p>Time</p> <p>Hysteresis</p> <p>Hysteresis</p> <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |

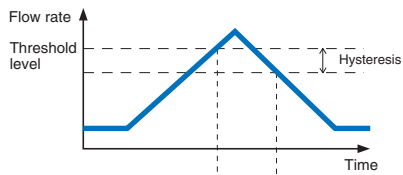
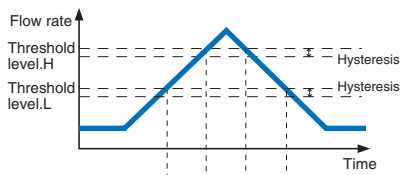
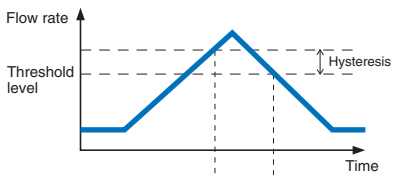
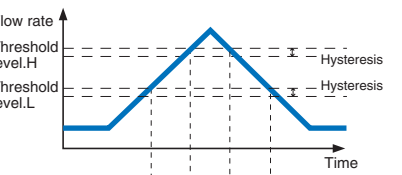
*1. The N.O./N.C. setting can be changed by the operation buttons or IO-Link communications.

*2. The timer function can be set individually for OUT1 and OUT2 by the operation buttons or IO-Link communications.
(Selection of ON delay, OFF delay, or one-shot function, and selection of a timer time from 1 to 9999 ms)

The delay timing of each function is same as the NPN output. Refer to the next page.

*3. Factory default

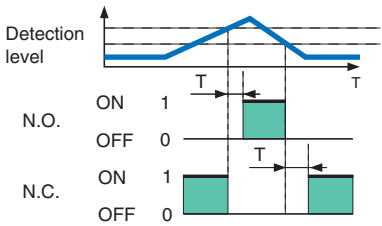
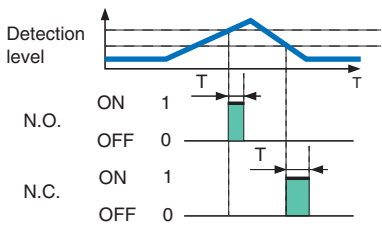
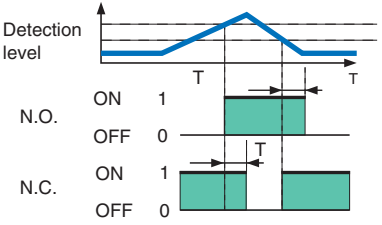

NPN output

| Model | N.O./N.C. setting *1 | Timing charts *2 | |
|---------|----------------------|---|--|
| | | Standard mode | Window mode |
| E8FC-25 | N.O. *3 |  <p>Flow rate</p> <p>Threshold level</p> <p>Time</p> <p>Hysteresis</p> <p>OUT1 control output</p> <p>ON</p> <p>OFF</p> <p>OUT1 operation indicator (orange)</p> <p>ON</p> <p>OFF</p> |  <p>Flow rate</p> <p>Threshold level.H</p> <p>Threshold level.L</p> <p>Time</p> <p>Hysteresis</p> <p>OUT1 control output</p> <p>ON</p> <p>OFF</p> <p>OUT1 operation indicator (orange)</p> <p>ON</p> <p>OFF</p> |
| | N.C. |  <p>Flow rate</p> <p>Threshold level</p> <p>Time</p> <p>Hysteresis</p> <p>OUT1 control output</p> <p>ON</p> <p>OFF</p> <p>OUT1 operation indicator (orange)</p> <p>ON</p> <p>OFF</p> |  <p>Flow rate</p> <p>Threshold level.H</p> <p>Threshold level.L</p> <p>Time</p> <p>Hysteresis</p> <p>OUT1 control output</p> <p>ON</p> <p>OFF</p> <p>OUT1 operation indicator (orange)</p> <p>ON</p> <p>OFF</p> |

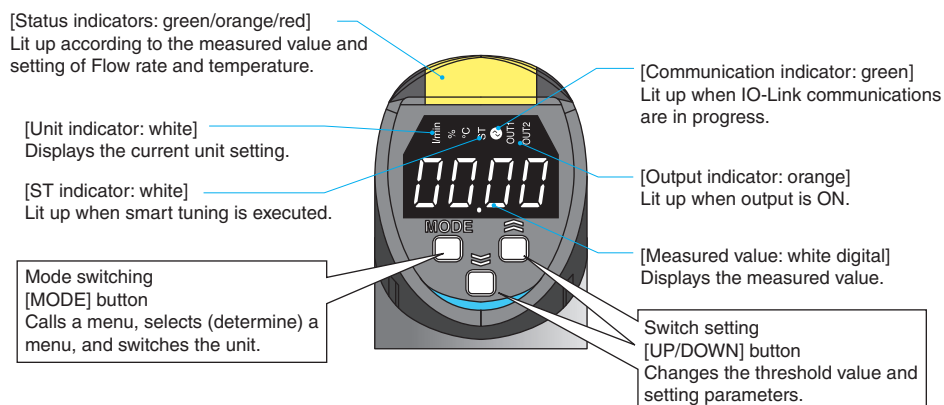
*1. The N.O./N.C. setting can be changed by the operation buttons.

*2. The timer function can be set individually for OUT1 and OUT2 by the operation buttons.

(Selection of ON delay, OFF delay, or one-shot function, and selection of a timer time from 1 to 9999 ms)

| | | | |
|----------|--|----------|--|
| ON delay |  <p>Detection level</p> <p>ON 1</p> <p>N.O.</p> <p>OFF 0</p> <p>N.C.</p> <p>ON 1</p> <p>OFF 0</p> | One-shot |  <p>Detection level</p> <p>ON 1</p> <p>N.O.</p> <p>OFF 0</p> <p>N.C.</p> <p>ON 1</p> <p>OFF 0</p> |
| |  <p>Detection level</p> <p>ON 1</p> <p>N.O.</p> <p>OFF 0</p> <p>N.C.</p> <p>ON 1</p> <p>OFF 0</p> | |  <p>Detection level</p> <p>ON 1</p> <p>N.O.</p> <p>OFF 0</p> <p>N.C.</p> <p>ON 1</p> <p>OFF 0</p> |



*3. Factory default








Safety Precautions

Be sure to read the precautions for all models in the website at: <http://www.ia.omron.com/>.

Warning Indications

| | | |
|---|----------------|---|
|  | Warning | Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally, there may be significant property damage. |
|  | Caution | Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage. |
| Precautions for Safe Use | | Supplementary comments on what to do or avoid doing, to use the product safely. |
| Precaution for Correct Use | | Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance. |

Meaning of Product Safety Symbols

| | |
|---|--|
|  | General Prohibition Indicates the instructions of unspecified prohibited action. |
|  | General caution Indicates unspecified general alert. |
|  | Caution, explosion Indicates the possibility of explosion under specific conditions. |
|  | Caution, high temperature Indicates the possibility of injuries by high temperature under specific conditions. |
|  | Caution, fire Indicates the possibility of fires under specific conditions. |

WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purpose.



The specification of this product is not for beverage, food, or medical chemicals. Do not use this product for the device contacting beverage, food, or medical chemicals.



Do not use the product with voltage in excess of the rated voltage. Excess voltage may result in malfunction or fire.



This product is not assumed to be used in explosion-proof areas. Do not use the product in explosion proof areas.



Never use the product with an AC power supply. Otherwise, explosion may result.



The product might fail or be destroyed. Do not impress any pressure exceeding the rated value even instantaneously.



The product might fail or be damaged. Do not stand on the sensor, or add excessive load.



The fluid in the pipe might spout out. Tighten the prescribed O-ring to the pipe.



Caution

The product might fail or be damaged. Piping, wiring, maintenance, and checkup must be done by operators with expertise.



The product might be damaged or fire. Do not short-circuit load.



The product might be damaged or fire. Be careful with polarity of the power supply to avoid incorrect wiring.



The user might get burned. The sensor surface temperature rises depending on the operating condition such as ambient temperature, power supply voltage, or fluid temperature. Be careful when operating or cleaning the product.



Precautions for Safe Use

The following items are necessary for ensuring safety, so be sure to observe them.

- Do not use the product in the following installation areas.
 - (1) Locations subject to direct sunlight
 - (2) Locations subject to condensation due to high humidity
 - (3) Locations subject to corrosive gas
 - (4) Locations subject to vibration or mechanical shocks exceeding the rated values
 - (5) Locations subject to exposure to water, oil, chemicals
 - (6) Locations subject to stream
 - (7) Locations subjected to strong magnetic field or electric field
- Do not use in an environment exposed to an inflammable/explosive gas
- Do not use in an ambient atmosphere or environment exceeding the rating.
- Although the product is classified into IP67, do not use it in water, under the rain, or outdoor.
- Do not use the product for any inflammable, explosive, or corrosive fluids.
- Do not freeze or solidify the fluid. Otherwise, the product might fail or be damaged.
- Provide a relief valve to prevent the circuit from liquid sealing.
- The surface temperature of the sensing part may increase. Use caution while operating and cleaning the product.
- Make sure safety before installing/replacing the sensor, for example, stop the machine or depressurize the fluid.
- In order to ensure safety of user operations and maintenance, install the product apart from high-pressure equipment or power equipment.
- When revolving the product, support the chassis holding part with a spanner.
- Wire this product separately from high-pressure wire or power wire. If wiring together with such wire or in the same duct, this product might receive induction, which might cause malfunctioning

or damages.

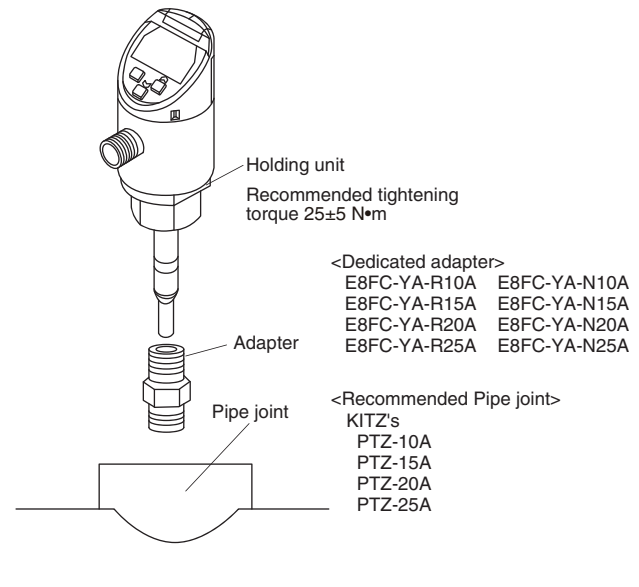
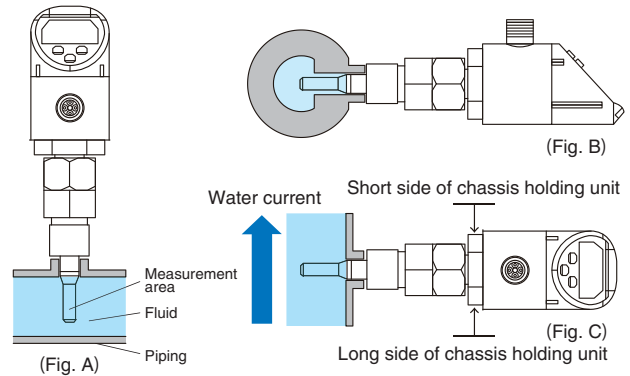
- Be sure to turn OFF the power before wiring.
- Do not wire with a wet hand.
- Use this product under the rated or smaller load. Otherwise, the product might be damaged or catch fire.
- Connect load correctly.
- If the load and sensor use separate power supplies, turn ON the sensor's power first.
- Process unwired terminals so that they do not contact other wire or equipment.
- Do not use the product with the main unit damaged.
- Be careful with the sharp screw parts.
- Do not pull connected cables hard.
- Do not use organic solvents such as thinner or alcohol for cleaning because they deteriorate the degree of protection and indication performance.
- Do not try to disassemble, repair, or alter the main unit.
- If disposing this product, handle it as industrial waste.
- This product is certified by the UL standard based on the assumption that Class 2 circuits are used. Operate this product using Class 2 power supply in the United States or Canada.
- Use cables of Omron model XS5F-D4 series or model XS5W-D4 series.
- The $\text{—} \text{—} \text{—}$ mark shown on the sensor nameplate means direct current.
- Electromagnetic environment: Industrial electromagnetic environment (EN 61326-1 Table2)

Precaution for Correct Use

- Do not use this product as a measuring apparatus for commercial transactions.
- Do not use this product for any fluids containing impurities.
- If the fluid is non-conductive and the pipe is made of resin, ground the chassis.
- Use the product in the condition that the fluid temperature is higher than the ambient temperature. For preventing condensation, use the product as dehumidifying by air conditioning and 30 cm or more apart from cold pipes.
- Do not add excessive impact such as falling or collision.
- Do not touch the detecting unit with bare hands.
- Apply grease to the thread parts to prevent them from getting hard to remove due to seizure.
- Fasten by the prescribed torque.
- When using a cable of which diameter is different from that of the recommended cable, prepare a ferrite core suitable for the cable diameter separately.
- If using the product in IO-Link mode, keep the wiring length between the master unit and sensor 20 m or less.
- Just after the power is turned ON, it might take long for the measured value to get stable according to the operating environment.
- Do not connect CH 2 (pin 2) with the IO-Link master unit in analog current output mode. The unit might fail depending on the specification of the IO-Link master.
- Do not push the button with something sharp such as a screwdriver because doing so might damage the button.
- If using the product in an environment subject to sharp temperature variation, evaluate the product in the environment in advance.
- When implementing maintenance, use a soft brush or waste cloth so as not to damage the detecting unit or O-ring.
- When replacing the O-ring, prevent dust/dirt from being mixed into the O-ring.
- Use the product in an environment at altitudes less than 2,000 m.
- Use the product in an environment of pollution degree 3.

Piping Method

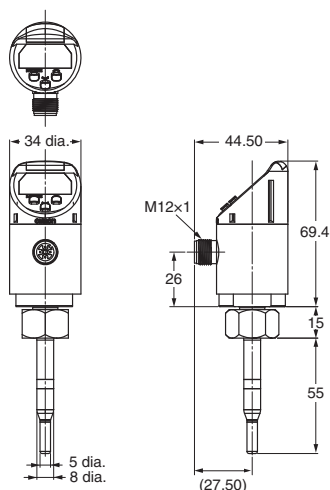
- Use the adapter according to the connection pipe diameter of the piping.
- Install such that measurement area is in contact with the fluid. Install so that the measurement area does not come into contact with the piping wall. (Fig. A)
- In the case of horizontal piping, it is recommended to install the sensor from the side. (Fig. B)
- In the case of vertical piping, it is recommended to install the sensor such that the flow is from the bottom to the top. (Fig. C)
- When revolving the product, support the chassis holding part with a spanner.



Dimensions

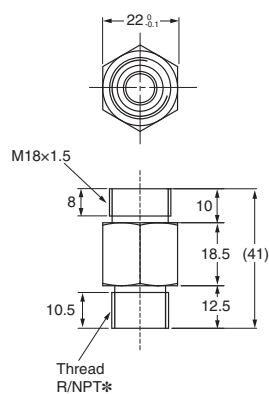
Sensors

IoT Flow Sensor E8FC-25□



Adapters

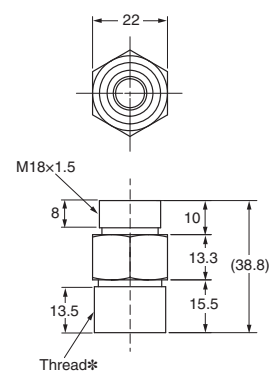
E8FC-YA-R10A E8FC-YA-N10A



* The specification for each model is shown in the table below.

| Model | E8FC-YA-R10A | E8FC-YA-N10A |
|---------------------|--------------|--------------|
| Applicable diameter | 10 A | |
| Threaded | R3/8 | NPT3/8 |

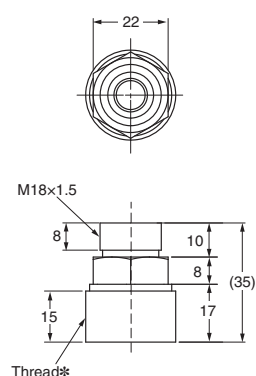
E8FC-YA-R15A E8FC-YA-N15A



* The specification for each model is shown in the table below.

| Model | E8FC-YA-R15A | E8FC-YA-N15A |
|---------------------|--------------|--------------|
| Applicable diameter | 15 A | |
| Threaded | R1/2 | NPT1/2 |

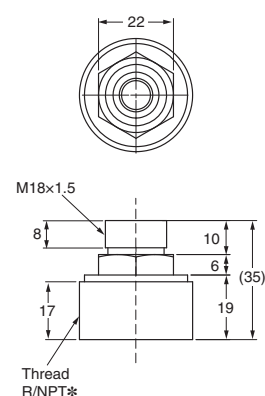
E8FC-YA-R20A E8FC-YA-N20A



* The specification for each model is shown in the table below.

| Model | E8FC-YA-R20A | E8FC-YA-N20A |
|---------------------|--------------|--------------|
| Applicable diameter | 20 A | |
| Threaded | R3/4 | NPT3/4 |

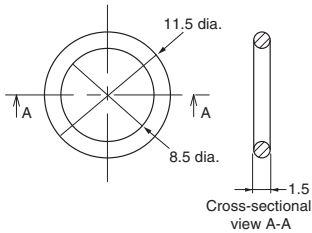
E8FC-YA-R25A E8FC-YA-N25A



* The specification for each model is shown in the table below.

| Model | E8FC-YA-R25A | E8FC-YA-N25A |
|---------------------|--------------|--------------|
| Applicable diameter | 25 A | |
| Threaded | R1 | NPT1 |

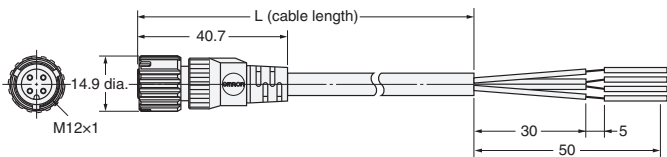
O-ring
E8FC-YL-1



Cables

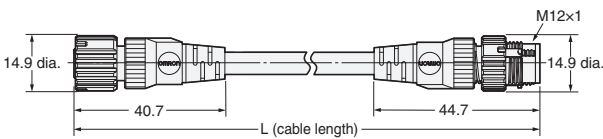
Sensor I/O Connectors (M12, Socket on one cable end)

Straight
XS5F-D421-D80-F
XS5F-D421-G80-F

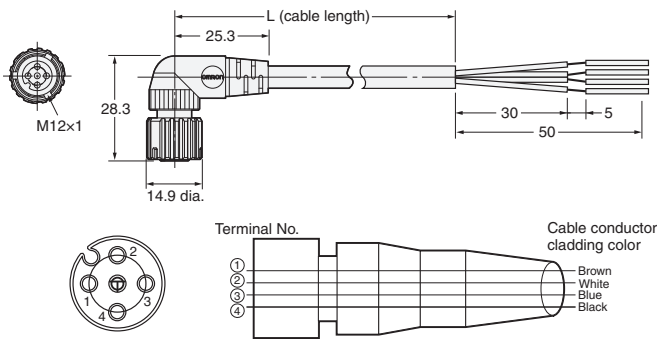


Sensor I/O Connectors (M12, Socket and plug on cable ends)

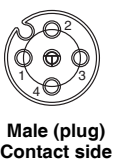
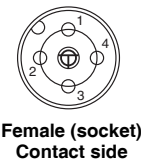
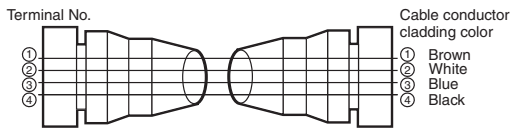
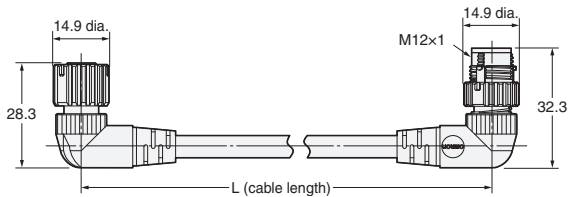
Straight/straight
XS5W-D421-D81-F
XS5W-D421-G81-F



L-shaped
XS5F-D422-D80-F
XS5F-D422-G80-F



L-shaped/L-shaped
XS5W-D422-D81-F
XS5W-D422-G81-F



IoT Pressure Sensors

E8PC

Detect Signs of Abnormalities in Cooling Water and Hydraulic Oil by Simultaneous Measurement of “Pressure + Temperature”



- Multi-sensing of “Pressure + temperature” for preventing a sudden stops or manufacturing defects.
- Various lineup of replacement adapters to enable easy replacement of your current pressure gauges and flow meters.
- Analog current output function in addition to the IO-Link communications function that can perform self-diagnosis of abnormalities in the sensor itself.



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

Refer to *Safety Precautions* on page 32.

Ordering Information

Sensors [Refer to *Dimensions* on page 34.]





| Appearance | Applicable fluid * | Rated pressure range | Control output | Communication method | IO-Link baud rate | Model |
|------------|--------------------|----------------------|----------------|----------------------|-------------------|--------------------|
| | Liquid and gas | -0.1 to 1 MPa | PNP | IO-Link Analog | COM2 (38.4 kbps) | E8PC-010D-E |
| | | | NPN | Analog | --- | E8PC-010-E |
| | Liquid | 0 to 10 MPa | PNP | IO-Link Analog | COM2 (38.4 kbps) | E8PC-100D-E |
| | | | NPN | Analog | --- | E8PC-100-E |
| | | 0 to 40 MPa | PNP | IO-Link Analog | COM2 (38.4 kbps) | E8PC-400D-E |
| | | | NPN | Analog | --- | E8PC-400-E |
| | | | PNP | IO-Link Analog | COM3 (230.4 kbps) | E8PC-100T-E |
| | | | NPN | Analog | --- | E8PC-400T-E |

Note: Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

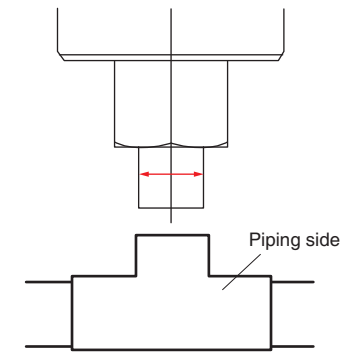
* The applicable fluid is a liquid that do not erode the liquid contact part materials (such as water, glycol solution, and oil).

Adapters *[Refer to Dimensions on page 34.]*

It must be selected from the adapters below.





| Appearance | Type | Nominal diameter of thread * | | Thread type | Materials | Model |
|---|-------------|------------------------------|--------------------|---------------------|-----------|--------------|
| | | Nominal diameter A | Nominal diameter B | | | |
|  | R1/8 male | 6 A | 1/8" | R (taper thread) | SUS304 | E8PC-YA-A18 |
|  | R1/4 male | 8 A | 1/4" | R (taper thread) | SUS304 | E8PC-YA-A14 |
|  | R3/8 male | 10 A | 3/8" | R (taper thread) | SUS304 | E8PC-YA-A38 |
|  | G1/4 female | 8 A | 1/4" | G (parallel thread) | SUS304 | E8PC-YA-B14N |
|  | NPT1/8 male | 6 A | 1/8" | NPT (taper thread) | SUS304 | E8PC-YA-C18 |
|  | NPT1/2 male | 8 A | 1/4" | NPT (taper thread) | SUS304 | E8PC-YA-C14 |

* The nominal diameter of the thread is the size of the part shown below on the adapter.



Cables (Sensor I/O Connectors)

A Cable is not provided with the Sensor. It must be ordered separately.




| Type | Appearance | Cable | Model |
|---------------------------------|--|-------|------------------------|
| Socket on one cable end | Straight  | 2 m | XS5F-D421-D80-F |
| | | 5 m | XS5F-D421-G80-F |
| | L-shaped  | 2 m | XS5F-D422-D80-F |
| | | 5 m | XS5F-D422-G80-F |
| Socket and plug on cable ends * | Straight/straight  | 2 m | XS5W-D421-D81-F |
| | | 5 m | XS5W-D421-G81-F |
| | L-shaped/L-shaped  | 2 m | XS5W-D422-D81-F |
| | | 5 m | XS5W-D422-G81-F |

Note: Refer to *Sensor I/O Connector/Sensor Controller* on your OMRON website for details.




* Straight type/L-shape type combinations are also available.

Throttle [Refer to *Dimensions* on page 35.]

If the excessive pulsation or surge voltage is expected, use a throttle. Install it inside the adapter and use.

| Appearance | Type | Material | Model | Installation method |
|---|----------------------|----------|------------------|--|
|  | For a male adapter | SUS304 | E8PC-YS |  <p>Pressure sensor</p> <p>Throttle</p> <p>Adapter</p> |
|  | For a female adapter | SUS304 | E8PC-YS-N | |

O-ring (for replacement) [Refer to *Dimensions* on page 35.]

| Appearance | Type | Model |
|---|-------------------------|--------------------|
|  | For E8PC-010□ | E8PC-YL-1 * |
|  | For E8PC-100□/-400□ | E8PC-YL-2 * |
|  | Female for adapter G1/4 | E8PC-YL-3 |

* Provided with the sensor.

E8PC

Ratings and Specifications

Sensors

| Model | PNP(COM2) | E8PC-010D-E | E8PC-100D-E | E8PC-400D-E |
|--------------------------------------|--|--|--------------------|--------------------|
| | PNP(COM3) | E8PC-010T-E | E8PC-100T-E | E8PC-400T-E |
| | NPN | E8PC-010-E | E8PC-100-E | E8PC-400-E |
| Pressure monitoring *1 | Rated pressure range | -0.1 to 1 MPa | 0 to 10 MPa | 0 to 40 MPa |
| | Display range | -0.20 to 1.10 MPa | -0.10 to 11.00 MPa | -0.10 to 44.00 MPa |
| | Withstand pressure *2 | 4 MPa | 30 MPa | 50 MPa |
| | Burst pressure | 8 MPa | 60 MPa | 80 MPa |
| | Display resolution | 0.001 MPa | 0.01 MPa | 0.01 MPa |
| | Applicable fluid temperature *3 | -20 to +100°C (no icing or condensation) | | |
| | Pressure response time *4 | Control output: Select 3 to 6000 ms Analog output: Set value + 2 ms (90% response) | | |
| | Pressure monitoring precision | ±1.0% of F.S. or less | | |
| | Pressure repeatability *5 | ±0.3% of F.S. or less | | |
| | Ambient temperature characteristics *6 | ±0.6% of F.S./10°C | | |
| | Hysteresis | Variable | | |
| | Pressure type | Gauge pressure | | |
| Temperature monitoring *7 | Temperature monitoring rated range | -20 to 100°C | | |
| | Temperature monitoring precision | ±4°C | | |
| | Temperature repeatability | ±1°C | | |
| Control output judgment (selectable) | Standard mode | Judge if the measured value is the threshold value or more (or less). | | |
| | Window mode | Judge if the measured value is within the upper and lower limits. | | |
| Compatible fluid | | Gas and fluid not corroding the material of the wetted part (such as water, glycol solution, and oil) | | |
| Display method | | Numerical value indication: 4-digit 7-segment white LED with inverting function Status indicator: Normal operation (green), status indication (orange), and error (red) The content of status indication is selectable. Output indicator: OUT1 operation (orange), OUT2 operation (orange) Unit indication: E8PC-□□□□: MPa (white), E8PC-□□□□-E: MPa (white), bar (white), psi (white), °C (white) IO-Link indicator: Lighting when communications are in progress (green) | | |
| Delay setting | | 1 to 9999 ms (Select a function from invalid, ON delay, OFF delay, and one-shot.) | | |
| Connection method | | M12, 4-pole connector type | | |
| Connecting diameter | | G3/4 male (Use the optional adapter to convert the diameter) Connection strength 20 N·m | | |
| Output ch1 (selectable) | Control output | Pressure control output (N.O./N.C.) E8PC-□□□□D/T: PNP E8PC-□□□: NPN 30 VDC or less, Class 2, max. 100 mA, residual voltage 1 V or less | | |
| Output ch2 (selectable) | Control output | Pressure control output (N.O./N.C.) / temperature control output (N.O./N.C.) E8PC-□□□□D/T: PNP E8PC-□□□: NPN 30 VDC or less, Class 2, 100 mA max., residual voltage 1 V or less | | |
| | Analog current output *8 | Pressure analog output / Temperature analog output Current output 4 to 20 mA (maximum load resistance 350Ω or less) (Display value ± 2% of F.S.) | | |
| | External input | One-point teaching, zero point adjustment input (selectable, initial status: invalid) short-circuit current 1.5 mA or less, input time 20 ms or more | | |

| Model | PNP(COM2) | E8PC-010D-E | E8PC-100D-E | E8PC-400D-E |
|------------------------|------------------------------------|--|-------------|-------------|
| | PNP(COM3) | E8PC-010T-E | E8PC-100T-E | E8PC-400T-E |
| | NPN | E8PC-010-E | E8PC-100-E | E8PC-400-E |
| IO-Link | IO-Link specification | Ver 1.1 | | |
| | Baud rate | E8PC-□□□D: COM2 (38.4kbps) E8PC-□□□T: COM3 (230.4Kbps) | | |
| | Data length | PD Size: 6 byte OD Size: 1 byte (M-sequence type: TYPE_2_V) | | |
| | Minimum cycle time | E8PC-□□□D (COM2): 3.2 ms E8PC-□□□T (COM3): 2.0 ms | | |
| Power supply | Power supply voltage | 10 to 30 VDC (including 10% ripple (p-p)), Class 2 | | |
| | Power consumption | 1,200 mW or less (When power supply voltage is 30 V, current consumption must be 40 mA or less. When power supply voltage is 10 V, current consumption must be 120 mA or less.) | | |
| Protection circuit | | Power supply reverse connection protection, output short-circuit protection, and output reverse connection protection | | |
| Environment resistance | Ambient temperature range | -20 to 80°C in operation and storage, respectively (no condensation) | | |
| | Ambient humidity range | -35 to 85%RH in operation and storage, respectively (no condensation) | | |
| | Vibration resistance (destruction) | 1000 VAC, 50/60 Hz, 1 min. between current-carrying parts and case | | |
| | Shock resistance (destruction) | 10 to 2000 Hz, double amplitude 1.5 mm, 2 hours in X/Y/Z direction each | | |
| | Impact (endurance) | 500 m/s ² , three times in X/Y/Z direction each | | |
| | Protective structure | IP67 | | |
| | Pollution degree | 3 | | |
| | Altitude | 2,000 m or less | | |
| Material | Installation place | Indoor | | |
| | Wetted part | Pressure port: SUS304L, diaphragm pressure port: Al ₂ O ₃ (alumina), O-ring: FKM | | |
| | | Other than wetted part | | |
| Weight | | Approx.190 g | | |
| Accessories | | <ul style="list-style-type: none"> Throttle (Model E8PC-YS and E8PC-YS-N), one each O-ring x 1 (Model E8PC-010: Model E8PC-YL-1, Model E8PC-100/400: Model E8PC-YL-2) Ferrite core x 1 (TDK's Model ZCAT1730-0730A) User's manual (Japanese, English, and Chinese), one each Compliance sheet Index list | | |

- *1. The pressure precision is defined based on the values measured in the ordinary temperature environment (approx. 23°C) using water at the ordinary temperature (approx. 23°C).
- *2. Even instantaneous pressure fluctuation such as water hammer must be within the withstand pressure. If instantaneous pressure fluctuation is expected, use the throttle included in the package.
- *3. If the pipe temperature exceeds 70°C, do not contact any cables with the pipe.
- *4. The maximum actual response time has error of 1 ms when the set response time is 3 to 10 ms, 5 ms when it is 11 to 100 ms, and +5% when it is 101 ms or more.
- *5. The pressure repeatability is the error of the detection point when pressure is applied repeatedly in the ordinary temperature environment (approx. 23°C) using water at the ordinary temperature (approx. 23°C) in the rated pressure range.
- *6. The ambient temperature characteristics are prescribed based on the value measured using oil as applying a pressure value of 50% of the maximum rated pressure.
- *7. The temperature monitoring precision is prescribed based on the value measured using water.
Temperature measurements are affected by both of the temperatures, the medium and the piping.
Temperature measuring elements are installed on the back surface of the piezoelectric element (inside the product) and used to measure the temperature. It might take long for the measured value to get stable according to the heat transmission speed.
- *8. Do not connect CH 2 (pin 2) with the IO-Link master unit in analog current output mode. Otherwise, the unit might fail.

E8PC
I/O Circuit Diagrams

PNP output

| Model | Output mode | I/O Circuit Diagrams * | | |
|----------------------------|------------------------------|------------------------|---------------------|----------------------------|
| | | External input mode | Control output mode | Analog current output mode |
| E8PC-□□□D-E E8PC-□□□T-E | Standard I/O mode (SIO mode) | | | |
| | IO-Link mode | | | |

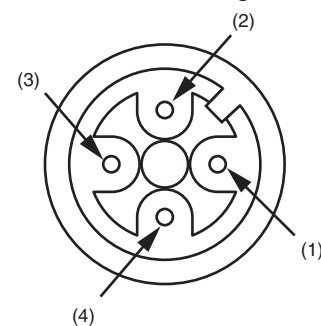
* Pin 2 input/output can be switched with either the operation buttons or the IO-Link communication command, "Pin 2 switching mode selection."

NPN output

| Model | Output mode | I/O Circuit Diagrams * | | |
|----------------------------|-------------|------------------------|---------------------|----------------------------|
| | | External input mode | Control output mode | Analog current output mode |
| E8PC-□□□D-E E8PC-□□□T-E | --- | | | |
| | --- | | | |

* Pin 2 input/output can be switched with the operation buttons.

Connector Pin Arrangement



Applicable OMRON connector cables: XS5F/XS5W Series
Applicable IO-Link master unit: NX/GX series

| Pin No. | E8PC-□□□D-E E8PC-□□□T-E | | E8PC-□□□-E |
|---------|----------------------------|---------------|---------------------|
| | Standard I/O mode | IO-Link mode | |
| (1) | +V | +V | +V |
| (2) | EXTIN/Analog/OUT2 * | Analog/OUT2 * | EXTIN/Analog/OUT2 * |
| (3) | 0 V | 0 V | 0 V |
| (4) | C/Q | C/Q | Q |

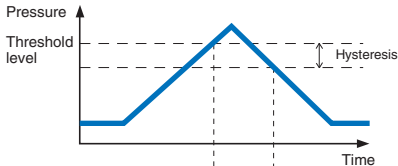
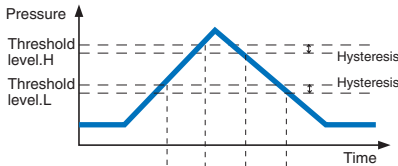
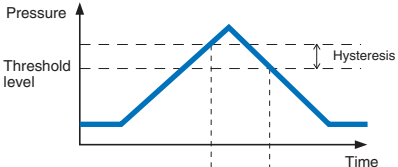
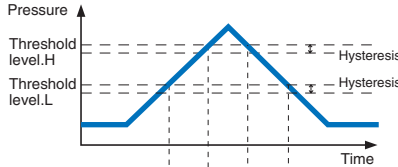
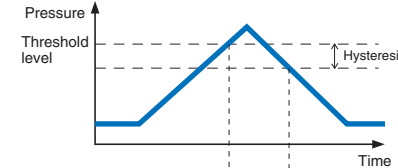
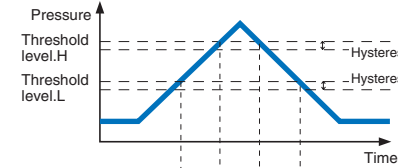
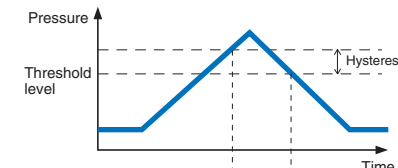
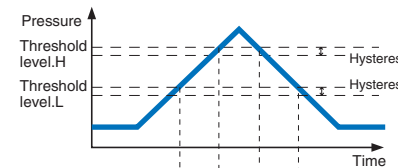
EXTIN: External input
Q: Control output
C: IO-Link communications

* Pin 2 input/output can be switched with either the operation buttons or the IO-Link communication command, "Pin 2 switching mode selection."

Timing Charts

The timing chart is described below by using the pressure control output of OUT1 as an example.
The activity is the same even when temperature control output is set in OUT2.

PNP output

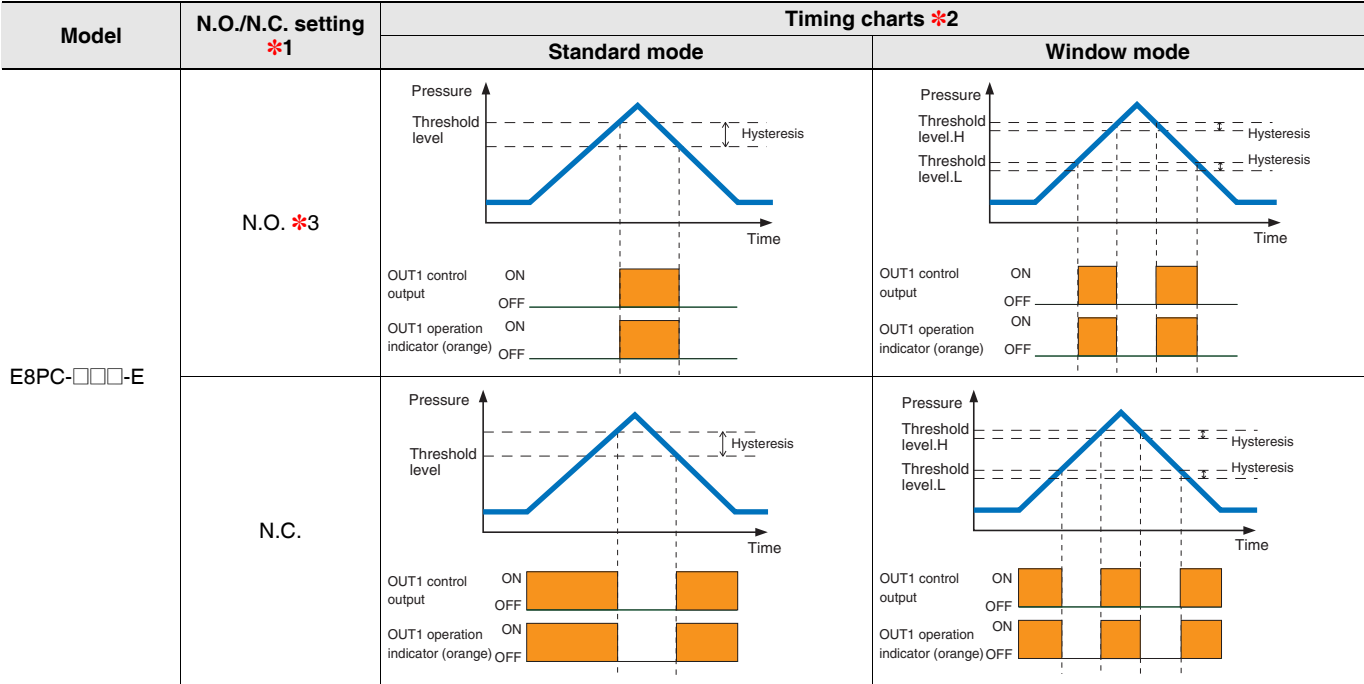
| Model | Output mode | N.O./N.C. setting *1 | Timing charts *2 | |
|----------------------------|---------------------------------|-------------------------|---|--|
| | | | Standard mode | Window mode |
| E8PC-□□□D-E E8PC-□□□T-E | Standard I/O mode (SIO mode) | N.O. *3 |  <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |  <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |
| | | N.C. |  <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |  <p>OUT1 control output ON</p> <p>OUT1 control output OFF</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |
| | IO-Link mode | N.O. *3 |  <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |  <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |
| | | N.C. |  <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |  <p>Communication indicator (Green) Lighting</p> <p>OUT1 control output (Byte1_bit0) 1</p> <p>OUT1 control output (Byte1_bit0) 0</p> <p>OUT1 operation indicator (orange) ON</p> <p>OUT1 operation indicator (orange) OFF</p> |

*1. The N.O./N.C. setting can be changed by the operation buttons or IO-Link communications.

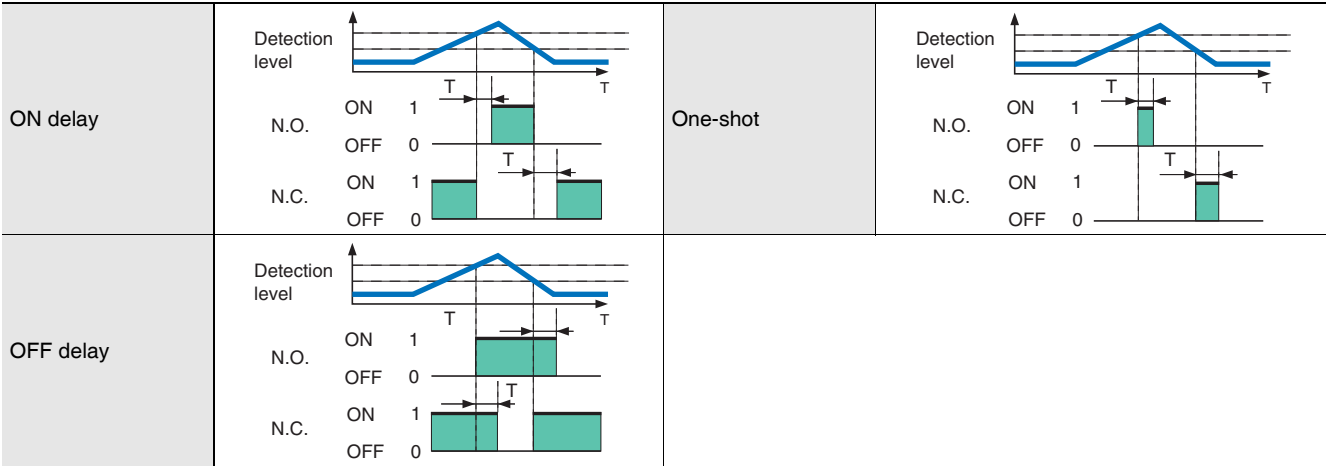
*2. The timer function can be set individually for OUT1 and OUT2 by the operation buttons or IO-Link communications.
(Selection of ON delay, OFF delay, or one-shot function, and selection of a timer time from 1 to 9999 ms)
The delay timing of each function is same as the NPN output. Refer to the next page.

*3. Factory default

NPN output



*1. The N.O./N.C. setting can be changed by the operation buttons.
*2. The timer function can be set individually for OUT1 and OUT2 by the operation buttons.
(Selection of ON delay, OFF delay, or one-shot function, and selection of a timer time from 1 to 9999 ms)



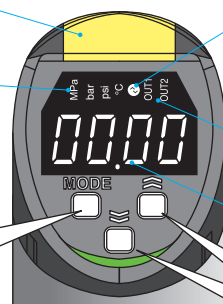
*3. Factory default

Nomenclature

[Status indicators: green/orange/red]
Lit up according to the measured value and setting of pressure and temperature.

[Unit indicator: white]
Displays the current unit setting.

Mode switching
[MODE] button
Calls a menu, selects (determine) a menu, and switches the unit.



[Communication indicator: green]
Lit up when IO-Link communications are in progress.

[Output indicator: orange]
Lit up when output is ON.



[Measured value: white digital]
Displays the measured value.

Switch setting
[UP/DOWN] button
Changes the threshold value and setting parameters.






Safety Precautions

Be sure to read the precautions for all models in the website at: <http://www.ia.omron.com/>.

Warning Indications

| | | |
|---|----------------|---|
|  | Warning | Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally, there may be significant property damage. |
|  | Caution | Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage. |
| Precautions for Safe Use | | Supplementary comments on what to do or avoid doing, to use the product safely. |
| Precaution for Correct Use | | Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance. |

Meaning of Product Safety Symbols

| | |
|---|--|
|  | General Prohibition Indicates the instructions of unspecified prohibited action. |
|  | General caution Indicates unspecified general alert. |
|  | Caution, explosion Indicates the possibility of explosion under specific conditions. |
|  | Caution, high temperature Indicates the possibility of injuries by high temperature under specific conditions. |
|  | Caution, fire Indicates the possibility of fires under specific conditions. |

WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purpose.



The specification of this product is not for beverage, food, or medical chemicals. Do not use this product for the device contacting beverage, food, or medical chemicals



Do not use the product with voltage in excess of the rated voltage. Excess voltage may result in malfunction or fire.



This product is not assumed to be used in explosion-proof areas. Do not use the product in explosion proof areas.



Never use the product with an AC power supply. Otherwise, explosion may result.



The product might fail or be destroyed. Do not impress any pressure exceeding the rated value even instantaneously.



The product might fail or be damaged. Do not stand on the sensor, or add excessive load.



The fluid in the pipe might spout out. Tighten the prescribed O-ring to the pipe.



Caution

The product might fail or be damaged. Piping, wiring, maintenance, and checkup must be done by operators with expertise.



The product might be damaged or fire. Do not short-circuit load.



The product might be damaged or fire. Be careful with polarity of the power supply to avoid incorrect wiring.



The user might get burned. The sensor surface temperature rises depending on the operating condition such as ambient temperature, power supply voltage, or fluid temperature. Be careful when operating or cleaning the product.



Precautions for Safe Use

The following items are necessary for ensuring safety, so be sure to observe them.

- Do not use the product in the following installation areas.
 - (1) Locations subject to direct sunlight
 - (2) Locations subject to condensation due to high humidity
 - (3) Locations subject to corrosive gas
 - (4) Locations subject to vibration or mechanical shocks exceeding the rated values
 - (5) Locations subject to exposure to water, oil, chemicals
 - (6) Locations subject to stream
 - (7) Locations subjected to strong magnetic field or electric field
- Do not use in an environment exposed to an inflammable/explosive gas
- Do not use in an ambient atmosphere or environment exceeding the rating.
- Although the product is classified into IP67, do not use it in water, under the rain, or outdoor.
- Do not use the product for any inflammable, explosive, or corrosive fluids.
- Do not freeze or solidify the fluid. Otherwise, the product might fail or be damaged.
- Provide a relief valve to prevent the circuit from liquid sealing.
- Make sure safety before installing/replacing the sensor, for example, stop the machine or depressurize the fluid.
- In order to ensure safety of user operations and maintenance, install the product apart from high-pressure equipment or power equipment.
- When revolving the product, support the chassis holding part with a spanner.
- Wire this product separately from high-pressure wire or power wire. If wiring together with such wire or in the same duct, this product might receive induction, which might cause malfunctioning or damages.
- Be sure to turn OFF the power before wiring.
- Do not wire with a wet hand.
- Use this product under the rated or smaller load. Otherwise, the product might be damaged or catch fire.
- Connect load correctly.

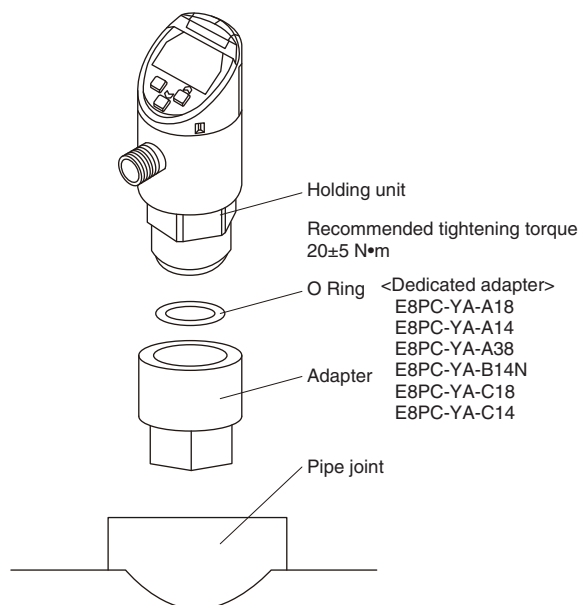
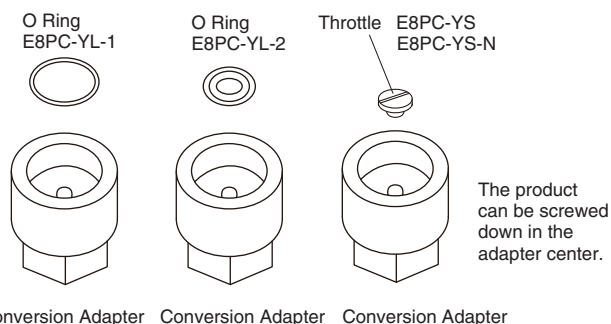
- If the load and sensor use separate power supplies, turn ON the sensor's power first.
- Process unwired terminals so that they do not contact other wire or equipment.
- Do not use the product with the main unit damaged.
- Be careful with the sharp screw parts.
- Do not pull connected cables hard.
- Do not use organic solvents such as thinner or alcohol for cleaning because they deteriorate the degree of protection and indication performance.
- Do not try to disassemble, repair, or alter the main unit.
- If disposing this product, handle it as industrial waste.
- This product is certified by the UL standard based on the assumption that Class 2 circuits are used. Operate this product using Class 2 power supply in the United States or Canada.
- Use cables of Omron model XS5F-D4 series or model XS5W-D4 series.
- The $\text{—} \text{—} \text{—}$ mark shown on the sensor nameplate means direct current.
- Electromagnetic environment: Industrial electromagnetic environment (EN 61326-1 Table2)

Precaution for Correct Use

- Do not use this product as a measuring apparatus for commercial transactions.
- Do not use this product for any fluids containing impurities.
- If the fluid is non-conductive and the pipe is made of resin, ground the chassis.
- Use the product in the condition that the fluid temperature is higher than the ambient temperature. For preventing condensation, use the product as dehumidifying by air conditioning and 30 cm or more apart from cold pipes.
- Do not add excessive impact such as falling or collision.
- Do not touch the detecting unit with bare hands.
- Apply grease to the thread parts to prevent them from getting hard to remove due to seizure.
- Fasten by the prescribed torque.
- When using a cable of which diameter is different from that of the recommended cable, prepare a ferrite core suitable for the cable diameter separately.
- If using the product in IO-Link mode, keep the wiring length between the master unit and sensor 20 m or less.
- Just after the power is turned ON, it might take long for the measured value to get stable according to the operating environment.
- Do not connect CH 2 (pin 2) with the IO-Link master unit in analog current output mode. The unit might fail depending on the specification of the IO-Link master.
- Do not push the button with something sharp such as a screwdriver because doing so might damage the button.
- If using the product in an environment subject to sharp temperature variation, evaluate the product in the environment in advance.
- When implementing maintenance, use a soft brush or waste cloth so as not to damage the detecting unit or O-ring.
- When replacing the O-ring, prevent dust/dirt from being mixed into the O-ring.
- Use the product in an environment at altitudes less than 2,000 m.
- Use the product in an environment of pollution degree 3.

Piping Method

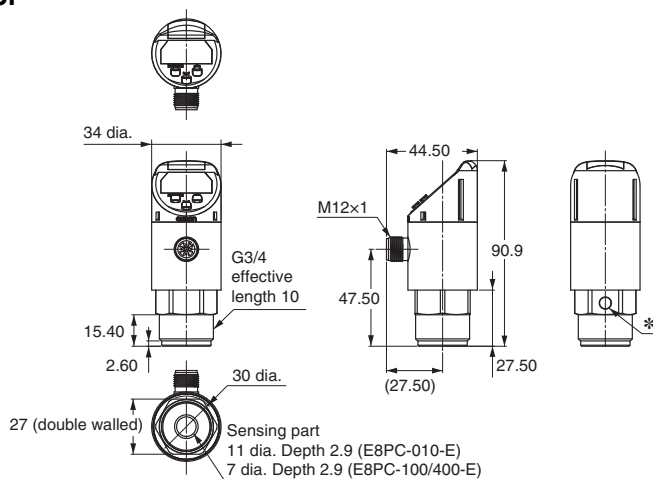
- Use adapters according to the connecting diameter of the pipe.
- To use the adapter, use the prescribed O-ring.
- If it is expected that the product receives excessive pulsation or surge pressure, use the throttle.
- When revolving the product, support the chassis holding part with a spanner.
- Mount the attached ferrite core at a position located within 10 mm from the edge of the cable bushing when you use this product as CE acceptable goods.



Dimensions

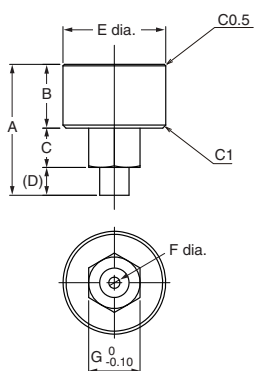
Sensors

E8PC-□□□-E



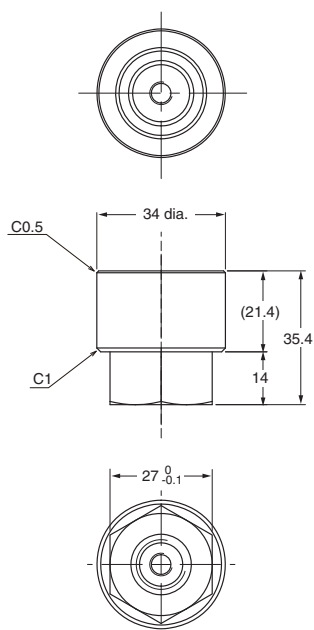
* There is no vent in E8PC-100/400-E.

E8PC-YA-A□□



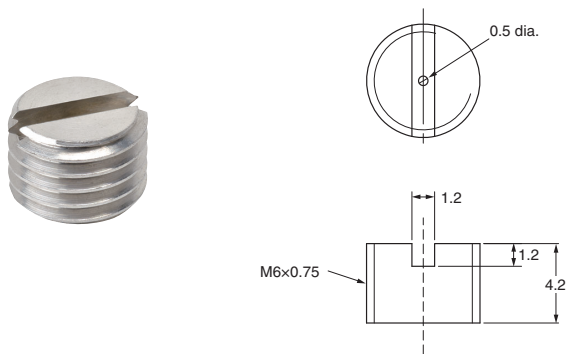
| Model | E8PC-YA-A18 | E8PC-YA-A14 | E8PC-YA-A38 | E8PC-YA-C18 | E8PC-YA-C14 |
|--------|-------------|-------------|-------------|-------------|-------------|
| Thread | G3/4×R1/8 | G3/4×R1/4 | G3/4×R3/8 | G3/4×NPT1/8 | G3/4×NPT1/4 |
| A | 43.3 | 47.1 | 47.6 | 43.3 | 47.1 |
| B | 21.1 | | | | |
| C | 13 | | | | |
| D | 9.2 | 13 | 13.5 | 9.2 | 13 |
| E | 34 | | | | |
| F | 3.7 | 4.8 | 5 | 3.7 | 4.8 |
| G | 17 | 17 | 19 | 17 | 17 |

E8PC-YA-B14N

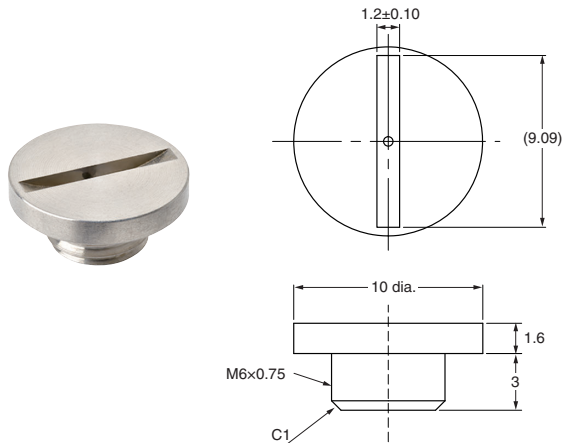


Throttle

E8PC-YS

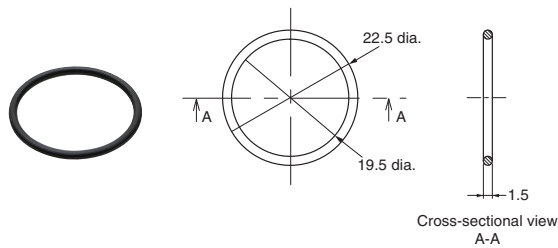


E8PC-YS-N

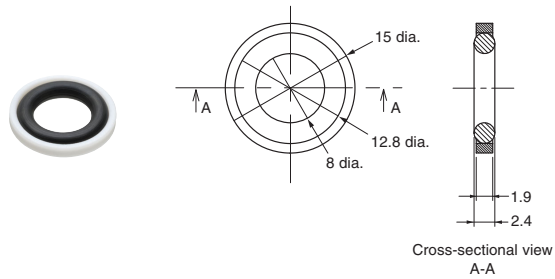


O-ring

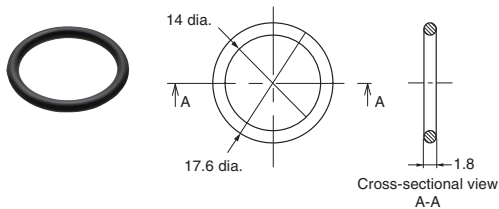
E8PC-YL-1



E8PC-YL-2



E8PC-YL-3



Cable

Refer to page 22 of E8FC.

Terms and Conditions Agreement

Read and understand this catalog.

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OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact: www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31) 2356-81-300/Fax: (31) 2356-81-388

OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

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