

Please read through this User's Manual before use for correct handling.
Please keep this User's Manual for future reference.

For safety:

The following symbol is used on the product and in this manual to ensure safe use:

CAUTION indicates caution. This symbol is displayed on the product when it is necessary to refer to the User's Manual for information on personnel and instrument safety. This symbol is displayed in the User's Manual to indicate precautions for avoiding danger to the operator, such as an electric shock.

The following symbol is used only in this manual:

NOTE draws attention to essential information for understanding the operations and/or functions of the product.

Product Disposal

The instrument should be disposed of in accordance with local and national legislation/regulations.

Authorized Representative in EEA

In relation to the CE Marking, the authorized representative for this product in the EEA (European Economic Area) is:

Yokogawa Europe B.V.

Euroweg 2, 3825 HD Amersfoort, The Netherlands

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YOKOGAWA
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YOKOGAWA

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1. PRODUCT INSPECTION

The pressure sensors are shipped only after stringent inspection at the factory. Upon delivery, check the sensor according to the instructions given below.

- Visually check the sensor to ensure that it is free from damage.
- The model and suffix codes and the pressure range are indicated on the data plate attached to the sensor. Cross-check this information with that in table 6 "Model and Suffix Codes" to ensure that the sensor is as specified in the order.

Note: If the specifications of the ordered sensor are not standard, refer to the label tag attached to the sensor.

2. HANDLING PRECAUTIONS

2.1 Storage

- Store the sensor in a location that meets the following requirements.
 - No exposure to rain or water
 - No major mechanical vibration or shocks
 - Humidity and temperature within the following ranges—preferably as close as possible to the normal condition (25°C, 65% RH)
Temperature: -20 to 80°C; humidity: 5 to 95% RH (non-condensing)
 - No corrosive gases
- Whenever possible, store the sensor in the same packaging that it was shipped in by the manufacturer.
- If the sensor has been put into use and the pressure-sensing chamber contains fluids, clean the chamber thoroughly before storing the sensor.
Even when cleaning the sensor, exercise care to avoid damaging the seal diaphragms.

2.2 Installation Location



Never use the sensor in an environment containing any explosive gas. It is not designed to be explosion-proof.

Although the pressure sensors are designed for use in severe environment, the following precautions should be observed to ensure that the sensors are used safely and that they achieve the required accuracy for a prolonged period.

- If it is likely that the sensor will be exposed to direct sunlight and/or other radiated heat, prepare some kind of heat insulation for the sensor.
- Avoid installing the sensor in an environment containing any corrosive gas.
- Although the sensor is designed to be water-resistant, avoid installing it in a location exposed to splashes of rain.
- Although the sensor is durable for vibration, install it in a location where mechanical vibration and/or shocks are minimal.

2.3 Precautions to Avoid Damaging the Sensor

- When measuring pressure or cleaning the sensor, exercise care to avoid damaging the seal diaphragms (see figure 1).
- The seal diaphragm may be damaged if the measured fluid within the pressure-sensing chamber freezes. If it is likely to occur, prepare some kind of heat insulation etc. to avoid measured fluid from freezing.
- When measuring liquid pressure, exercise care to prevent air bubbles from entering the nipple connector. (Whenever possible, mount the sensor so that the process connection faces upward.)
- Securely mount the sensor by firmly tightening the hexagonal nut of nipple connector with a wrench. Do not tighten the sensor by turning the case or cable gland assembly. Otherwise the sensor may be damaged. The recommended torque is 40 N·m.
- When measuring liquid pressure (especially in vacuum or high pressure condition), sudden pressure change causes impulse pressure. Mount a damper (a fitting for dampening the pulsating pressure) or the like to keep the pressure within the maximum allowable pressure (see table 2). Do not install the sensor at the bend of the piping where impulse pressure is likely to be applied.
- When starting up the system, take care not to apply the pressure to the sensor rapidly; for example, in an environment where valves are mounted nearby, manipulate the valves gradually. Even an instantaneous burst of pressure exceeding the maximum allowable pressure may damage the sensor die.

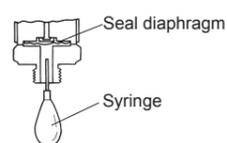


Figure 1 Cleaning of the Pressuresensing Chamber Interior

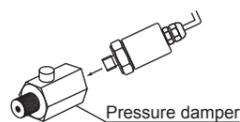


Figure 2

2.4 Insulation Resistance and Withstanding Voltage Test Procedures



Carry out these tests only when absolutely necessary. Mistake in testing may result in electric shock to the operator or damaging the sensor.

- Short-circuit the lead wires except the ground lead wire. For each test, apply the following voltages across the short-circuited lead wires and the ground lead wire.
 - Insulation Resistance Test: 500 V DC, for 2 minutes max.
Make sure the insulation resistance is 20 MΩ or more.
 - Withstanding Voltage Test: 500 V AC, for 1 minute max.
Make sure the leak current is 1 mA or less.
- After the tests, connect a 100 kΩ resistor across the short-circuited wires and the ground lead wire in order to discharge any internal charge.

3. PRODUCT OVERVIEW

3.1 Relation between Pressure and Output Signal

The output signal is proportional to pressure. As an example, Table 1 shows relation between pressure and output signal of FP101/FP201 at the 0 to 1 MPa measuring range.

Table 1 Pressure and FP101 Output Signal

Measuring Range Pressure	% Display	FP101	FP201
		Output Signal	Output Signal
0 MPa	0 %	1 V DC	4 mA DC
0.25 MPa	25 %	2 V DC	8 mA DC
0.5 MPa	50 %	3 V DC	12 mA DC
0.75 MPa	75 %	4 V DC	16 mA DC
1.0 MPa	100 %	5 V DC	20 mA DC

3.2 Components

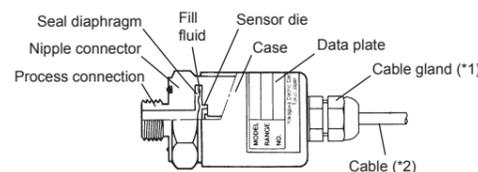


Figure 3 Components

*1: Do not tighten or loosen the cable gland section. Failure to follow this instruction may result in damage to the soldered joints that connect the cable (lead wire) with the electronic circuit, due to the deterioration of tightness within the case or cable disconnection.

*2: Do not carry the sensor around by holding the cable.

3.3 Specifications

Table 2 Measuring Range

Code	Typical range	Max. allowable pressure	Min. vacuum pressure (*1)		Max. cyclic load (0 to 100%)	Availability (*1)		
			GAUGE	ABS		ABS	R1	VT
U	-10 to 10 kPa	200 kPa	2.7 kPa abs	---	10 ⁶ times	---	○	---
V	0 to 25 kPa	150 kPa	(*5)	---	10 ⁶ times	---	○	---
J	-100 to 0 kPa	400 kPa	2.7 kPa abs	---	10 ⁶ times	---	○	○(*2)
N	-100 to 100 kPa	800 kPa	2.7 kPa abs	---	10 ⁶ times	---	○	○
M	-100 to 300 kPa	2 MPa	2.7 kPa abs	---	10 ⁶ times	---	○	○
T	0 to 10 kPa	100 kPa	(*5)	---	10 ⁶ times	---	---	---
S	0 to 20 kPa	150 kPa	(*5)	---	10 ⁶ times	---	---	---
R	0 to 30 kPa	150 kPa	(*5)	---	10 ⁶ times	---	○	---
K	0 to 50 kPa (abs)	200 kPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○(*3)
L	0 to 100 kPa (abs)	400 kPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○(*3)
A	0 to 200 kPa (abs)	800 kPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○(*4)
B	0 to 500 kPa (abs)	2 MPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○
C	0 to 1 MPa (abs)	2 MPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○
D	0 to 2 MPa (abs)	4 MPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○
E	0 to 5 MPa (abs)	10 MPa	2.7 kPa abs	130 Pa abs	10 ⁶ times	○	○	○
1	0 to 10 MPa	20 MPa	2.7 kPa abs	---	10 ⁶ times	---	---	---
2	0 to 20 MPa	40 MPa	2.7 kPa abs	---	3x10 ⁵ times	---	---	---
3	0 to 35 MPa	50 MPa	2.7 kPa abs	---	3x10 ⁵ times	---	---	---

*1: GAUGE: gauge pressure sensor; ABS: absolute pressure sensor; R1: process connection "3B" (R1); VT: option "VT" (high temperature type)

*2: The process connection "3B" (R1) is not available.

*3: The process connection "3B" (R1) is not available.

The absolute pressure sensor is not available.

*4: The absolute pressure sensor with the process connection "3B" (R1) is not available.

*5: Negative pressure must not be applied to R, S, T or V range.

Table 3 Specifications (except for the high temperature type)

Code	Measurement Accuracy (% of span)(*1)		Temperature effect (zero point) (% of span/°C)	Compensation temperature range (°C)		Operating temperature range (°C)	Attitude error (approx.) (Pa/90°)		Weight (approx.) (g)	
	except for R1	for R1		except for R1	for R1		except for R1	for R1	except for R1	for R1
U	±0.5	±1	±0.1	0 to 50	0 to 50	-10 to 60	30	400	230	410
V	---	±0.6	±0.1	---	0 to 50	-10 to 60	---	400	---	410
J	±0.25	±0.3	±0.05	-25 to 75	0 to 60	-40 to 80	30	400	230	410
N,M	±0.25	±0.3	±0.03	-25 to 75	0 to 75	-40 to 80	30	400	230	410
T	±0.5	---	±0.1	-10 to 75	---	-40 to 80	60	---	350	---
S	±0.35	---	±0.08	-10 to 75	---	-40 to 80	60	---	350	---
R	±0.25	±0.3	±0.08	-10 to 75	0 to 50	-40 to 80	30	400	230	410
K	±0.25	±0.3	±0.08	-25 to 75	0 to 60	-40 to 80	30	400	230	410
L	±0.25	±0.3	±0.05	-25 to 75	0 to 60	-40 to 80	30	400	230	410
A,B,C,D,E	±0.25	±0.3	±0.02	-25 to 75	0 to 75	-40 to 80	30	400	230	410
1,2,3	±0.25	---	±0.02	-25 to 75	---	-40 to 80	250	---	310	---

*1: Including linearity, hysteresis and repeatability.

Table 4 Specifications (for the high temperature type /VT)

Code	Pressure type	Measurement Accuracy (% of span) (*1)	Temperature effect (zero point) (% of span/°C)	Compensation temperature range (main unit) (°C)	Operating temperature range (main unit) (°C)	Process temperature range (°C)	Attitude error (approx.) (Pa/90°)		Weight (approx.) (g)	
							except for R1	for R1	except for R1	for R1
J, K, L	GAUGE	±0.35	±0.08	10 to 75	-10 to 80	-10 to 150	300	---	350	---
N, A	GAUGE	±0.35	±0.05	10 to 75	-10 to 80	-10 to 150	300	700	350	530
A	ABS	±0.35	±0.05	10 to 75	-10 to 80	-10 to 120	300	---	350	---
M	GAUGE	±0.35	±0.03	10 to 75	-10 to 80	-10 to 150	300	700	350	530
B, C, D, E	GAUGE/ABS	±0.35	±0.03	10 to 75	-10 to 80	-10 to 150	300	700	350	530

*1: Including linearity, hysteresis and repeatability.

Table 5 Specifications (for all types)

Measured fluid	Liquid or gas
Process connection	G1/4, 3/8, 1/2 (PF1/4, 3/8, 1/2), R1/4, 3/8, 1/2, 1 (PT1/4, 3/8, 1/2, 1), 7/16-20UNF
Enclosure classification	JIS C0920 IP66 water-resistant type, non-water-proof for the connector of the connector type
Material	Diaphragm: Hastelloy-C; nipple connector: SUS316; fill fluid: silicone oil; case: aluminum alloy; O-ring: fluoro rubber (viton)
Vibration resistance	100m/s ² (except for the high temperature type), 20m/s ² (for the high temperature type) in 3 directions for 2 hours at 150Hz or less
Mechanical shock resistance	1000 m/s ² (except for the high temperature type), 200m/s ² (for the high temperature type) in 3 directions for 3 times
Ambient humidity limits	5 to 95% RH (non-condensing)
Supply voltage	FP101/FP101A: 12 to 30 V DC FP201/FP201A: 12 to 28 V DC (recommended voltage: 24 V DC ±10%) see graph 1
Supply voltage effect (zero point)	±0.005% of span/V
Output signal	FP101/FP101A: 1 to 5 V DC (0 to 5 V DC for /V1), four-wire FP201/FP201A: 4 to 20 mA DC, two-wire
Load resistance	FP101/FP101A: 10 kΩ or more FP201/FP201A: 0 to 600 Ω (at 24 V DC power supply) see graph 1
Power consumption	FP101/FP101A: 5mA or less (at 24 V DC power supply)
Output resistance	FP101/FP101A: Up to 2 Ω
Insulation resistance	20 MΩ or more/500 V DC
Withstanding voltage	500 V AC for 1 minute, 1 mA or less
EMC standards	FP101/FP101A: EN61326-1 Class A, Table1, EN61326-2-3 (*1) FP201/FP201A: EN61326-1 Class A, Table2, EN61326-2-3 (*1)
EU RoHS Directive	Applicable standard: EN IEC 63000
Time constant	3 ms or less
External zero adjustment	available for /TR1 type only. Zero adjustment limit: ±5%

*1: Immunity influence during the test: Output shift is specified within ±5% of Max. range.

[Supplementary note]

- This sensor is adjusted under the following conditions before shipment at the factory.
 - Ambient temperature: 25°C±5°C
 - Power supply voltage: 24 V DC±1%
 - Mounting position: Horizontal (position in figure 3)
- The sensor for gauge pressure type lets in reference atmospheric pressure through cable. For E range or more, an error by atmospheric pressure fluctuation occurs because of its shield gauge construction. Reference atmospheric pressure is 101.3 kPa abs. Add the atmospheric pressure fluctuation error besides accuracy and temperature effects.

<Example> The atmospheric pressure fluctuation error for the range of 0 to 5 MPa is as follows:

 - +0.02% of span when atmospheric pressure rises 1 kPa from 101.3 kPa abs.
 - 0.02% of span when atmospheric pressure drops 1 kPa from 101.3 kPa abs.
- <Reference> Formula for overall accuracy is shown below:

Overall accuracy is the amount of all errors such as accuracy, error caused by temperature change (temperature effect) and the like. The expression for overall accuracy is as follows.

 - Range ≤ D

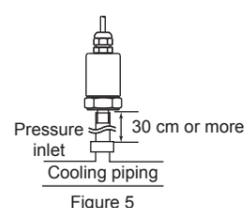
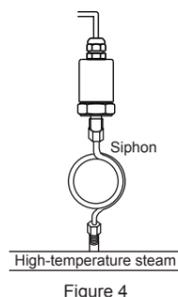
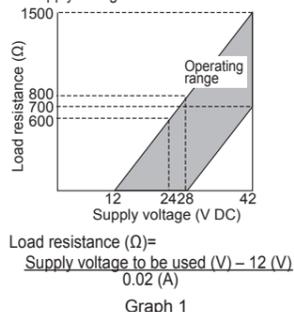
$$\text{Overall accuracy} = \pm \sqrt{(\text{Accuracy})^2 + (\text{Temperature effect (zero point)} \times A)^2 + (\text{Temperature effect (span)} \times A)^2}$$
 - Range ≥ E

$$\text{Overall accuracy} = \pm \sqrt{(\text{Accuracy})^2 + (\text{Temperature effect (zero point)} \times A)^2 + (\text{Temperature effect (span)} \times A)^2 + (\text{Atmospheric pressure fluctuation error})^2}$$

A = Sensor temperature when measuring pressure - Temperature mentioned in the certificate
 Temperature effect (span) [% of span/°C] = ±0.02 (reference value)
 Atmospheric pressure fluctuation error = See (5).
- Temperature effects (zero point reference value) for 0 to 50°C are as follows.
 - ±0.015% of span/°C (A, B, C, D, E, 1, 2, 3 range)
 - ±0.03% of span/°C (L, J, N, M range)
 - ±0.06% of span/°C (T, S, K range)
- If the wetted part temperature exceeds the maximum temperature, use a siphon to apply pressure to the sensor within the maximum temperature. See figure 4.
- A requirement for water-resistant type pressure sensor is that no water must penetrate the sensor for 3 minutes when the water is omni-directionally jetted toward the sensor at a rate of 12.5 l/min at a pressure of 30 kPa from a distance of 3 m. See "Enclosure classification" in table 5.
- <Measures against condensation>

Keep the sensor more than 30 cm apart from cooling piping by pressure inlet to make the temperature difference between the sensor and ambient temperature within 5°C. See figure 5.

<Supply voltage and Load Resistance>



(8) Control of Pollution Caused by the Product

This is an explanation for the product based on "Control of Pollution caused by Electronic Information Products" in the People's Republic of China. The information is valid only in China.

产品中有有害物质或元素的名称及含量

型号	部件名称	有害物质					
		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
FP Series 压力传感器	壳体	×	○	○	○	○	○
	基板组件	×	○	○	○	○	○
	电源连接线	×	○	○	○	○	○

○: 表示该部件的所有均质材料中的有害物质的含量均在 GB/T26572 标准中所规定的限量以下。
 ×: 表示至少该部件的某些均质材料中的有害物质的含量均在 GB/T26572 标准中所规定的限量以上。

环保使用期限:



该标识适用于 SJ/T11364 中所述, 在中华人民共和国销售的电子电气产品的环保使用期限。

注) 该年数为“环保使用期限”, 并非产品的质量保质期。

3.4 Model and suffix codes

Table 6 Model and Suffix Codes

Model	Suffix Code	Specifications				
FP101 FP201		1 to 5 V DC output, gauge pressure 4 to 20 mA DC output, gauge pressure				
FP101A FP201A		1 to 5 V DC output, absolute pressure (*1) 4 to 20 mA DC output, absolute pressure				
Measuring range		Typical range ZERO SPAN ZERO SPAN				
	U	-10 to 10 kPa	-50 to 0	20.000 to 44.999	---	---
	V(*4)	0 to 25 kPa	0	20.000 to 29.999	---	---
	J	-100 to 0 kPa	-110 to 0	50.001 to 110.00	---	---
	N	-100 to 100 kPa	-110 to 0	110.01 to 249.99	---	---
	M	-100 to 300 kPa	-110 to 0	250.00 to 999.99	---	---
	T	0 to 10 kPa	0	10.000 to 17.999	---	---
	S	0 to 20 kPa	0	18.000 to 29.999	---	---
	R	0 to 30 kPa	0	30.000 to 44.999	---	---
	K	0 to 50 kPa (abs)	-110 to 0	45.000 to 50.000	0	45.000 to 50.000
	L	0 to 100 kPa (abs)	0	50.001 to 110.00	0	50.001 to 110.00
	A	0 to 200 kPa (abs)	0	110.01 to 249.99	0	110.01 to 249.99
	B	0 to 500 kPa (abs)	0	250.00 to 999.99	0	250.00 to 999.99
C	0 to 1 MPa (abs)	-0.1100 to 0	1.0000 to 1.4000	0	1.0000 to 1.4000	
D	0 to 2 MPa (abs)	-0.1100 to 0	1.4001 to 2.2000	0	1.4001 to 2.2000	
E	0 to 5 MPa (abs)	-0.1100 to 0	2.2001 to 5.0000	0	2.2001 to 5.0000	
1	0 to 10 MPa	-0.1100 to 0	5.0001 to 14.000	---	---	
2	0 to 20 MPa	-0.1100 to 0	14.001 to 20.000	---	---	
3	0 to 35 MPa	-0.1100 to 0	20.001 to 35.000	---	---	
Process connection	11	G1/4 parallel thread for pipes (O-ring-sealed)				
	12	G3/8 parallel thread for pipes (O-ring-sealed)				
	21	G1/4 parallel thread for pipes (Gasket-sealed)				
	22	G3/8 parallel thread for pipes (Gasket-sealed)				
	23	G1/2 parallel thread for pipes (Gasket-sealed)				
	31	R1/4 (Taper screw for pipes)				
	32	R3/8 (Taper screw for pipes)				
33	R1/2 (Taper screw for pipes)					
3B	R1 (Taper screw for pipes, with top of diaphragm shape)(*2)					
C1	7/16-20UNF (*5)					
Cable connection	-C	Connector				
	-L	Cable (*3)				
Cable length	N	No cable (for connector type only) (*3)				
	2	Provided with 2-m cable				
	5	Provided with 5-m cable				
	C	Provided with 10-m cable				
Cable type	0	Always 0				
Cable end treatment	A	Always A, preprocessed (pre-soldered)				
Style code	*B	Style B				
Option code	/B1	Degrease cleansing treatment				
	/B2	Degrease cleansing and dehydrating treatment				
	/V1	0 to 5 V DC output (*6)				
	/TR1	Zero-adjustment trimmer (*7)				
	/VT	High temperature type (*8)				

*1: The absolute-pressure sensor has only seven measuring ranges: K, L, A, B, C, D, E range.

*2: T, S, 1, 2 and 3 range are not available for process connection "3B."

*3: The combination of "-LN" is not available.

*4: V range is available only for process connection "3B."

*5: T, S, R, 1, 2 and 3 range are not available for process connection "C1".

*6: Option code "/V1" is not available for the FP201/FP201A or "U, V" range.

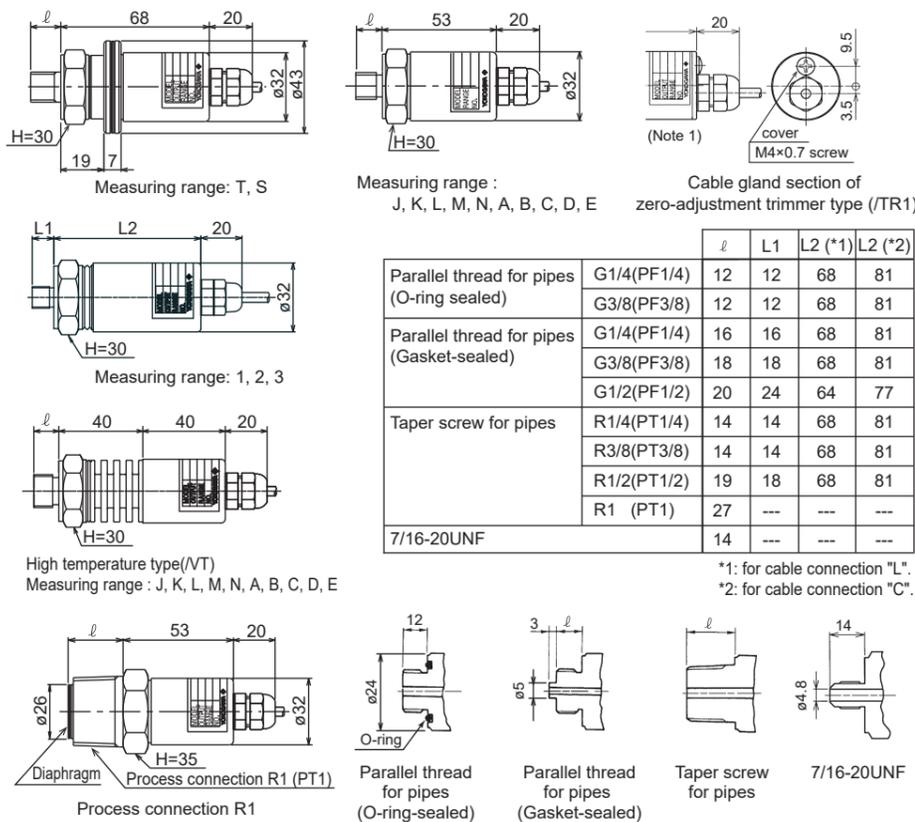
*7: Option code "/TR1" is not available for Cable connection "-C".

*8: The option code /VT is available only for the ranges as below.

Process connection / pressure type	Gauge pressure	Absolute pressure
Except for "3B"	K, L, J, A, N, B, M, C, D, E	A, B, C, D, E
For "3B"	A, N, B, M, C, D, E	B, C, D, E

3.5 External Dimensions

■ Cable



■ Connector

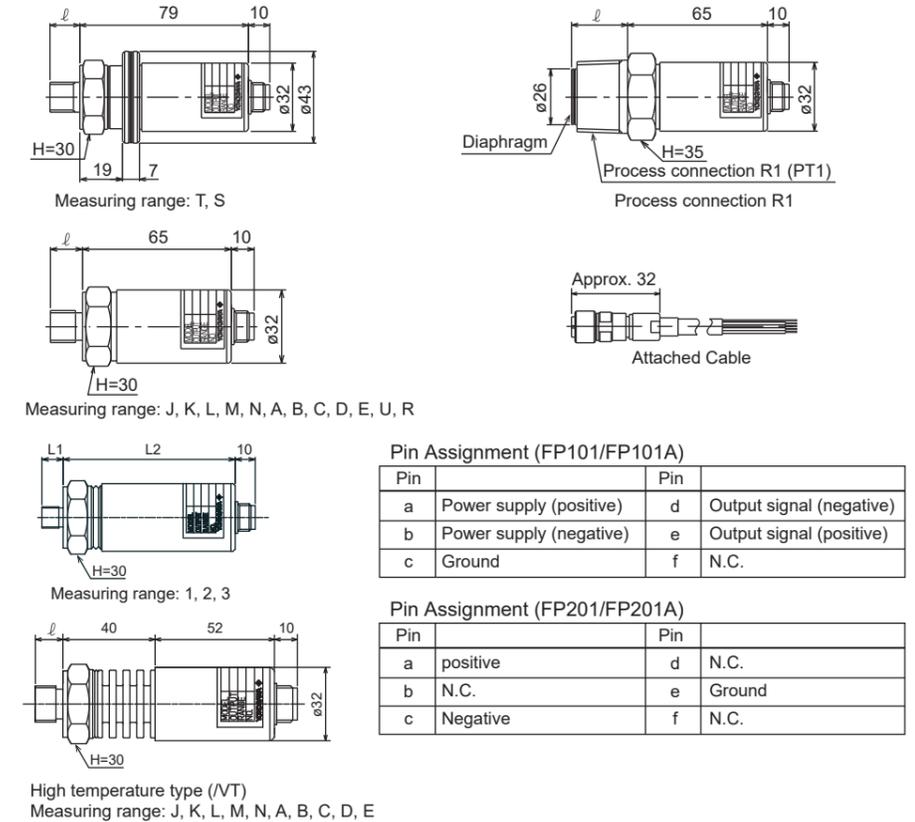


Figure 6 External Dimensions

Note 1: Use a miniature screwdriver for adjusting a trimmer. Available range for zero adjustment is approx. ±5% of span. The maximum rotating angle of the trimmer is ±120°. If turned to ±120° or more, it may be damaged.

3.6 Wiring

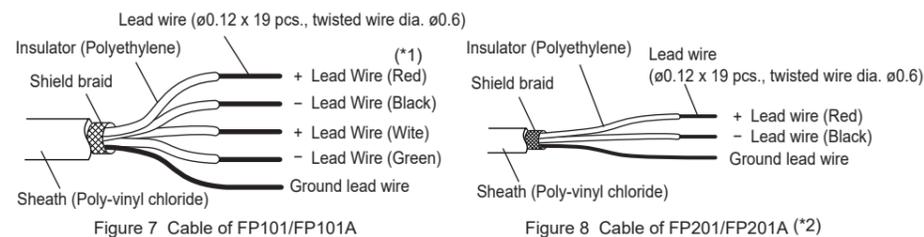


Figure 7 Cable of FP101/FP101A

Figure 8 Cable of FP201/FP201A (*2)

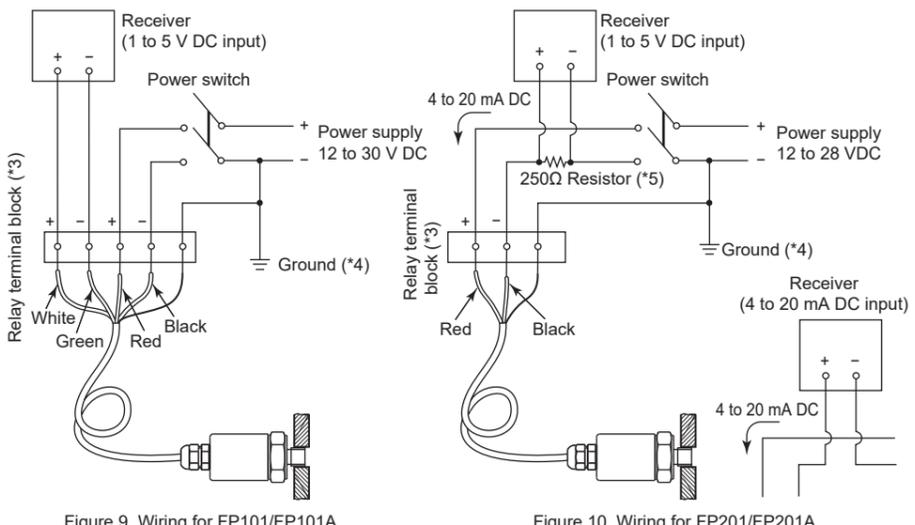


Figure 9 Wiring for FP101/FP101A

Figure 10 Wiring for FP201/FP201A

- *1: For 1 to 5 V DC output model, the power supply (negative) and the output signal (negative) must not be shorted. For 4 to 20 mA DC output model, the power supply (negative) and the output signal (negative) are connected inside.
- *2: As only red and black wires are used for FP201/FP201A, cut off the white and green lead wires.
- *3: Use a relay terminal block if necessary.
- *4: Be sure to ground the ground lead wire. Do not ground the ground lead wire when the process connection is grounded.
- *5: Select resistor resistance that matches the receiver input rating. Figure above shows that the receiver input rating is 1 to 5 V DC. No resistor is required when the receiver input rating is 4 to 20 mA DC.

4. PREPARATION FOR OPERATION

4.1 Mounting the Sensor

Make sure there is no problem of application before mounting the sensor. Refer to "2.3 Precautions to Avoid Damaging the sensor."

4.2 If Necessary, Treat the Ends of the Cable as Instructed Below

Cut the ends of the lead wires (soldered) when attaching solderless terminals to the + and - lead wires for power supply and output signal, and ground lead wire. Choose the type of solderless terminals with a nominal size that fits the size of the terminal screw and the thickness of the lead wires. See figure 7 and 8.

4.3 Wiring the sensor (See figure 9 and 10)



Before wiring, turn off the power to the sensor.

When wiring the sensor, make sure the polarities are correct. Use a receiver with input impedance of 10 kΩ or more for receiving the output signal (1 to 5 V DC or 0 to 5 V DC) of the FP101/FP101A.

5. START OF OPERATION

- (1) Make sure the supply voltage meets the specification.
- (2) Turn on the power to the sensor to start measurement.
- (3) Apply pressure equivalent to 0% of the measuring range and check that the receiver indicates 0%.

6. WARRANTY



- (1) This product is guaranteed for a period of one year from the date of delivery. Yokogawa Electric Corporation (hereinafter, simply referred to as Yokogawa) will replace the guaranteed part or parts of the product in question, free of charge, if the product fails during the guarantee period for reasons that are attributed to Yokogawa. The guarantee for this product becomes void if the failure is due to any of the following:
 - Improper handling or misuse of the product by the user. (Including installation and use not observing this user's manual.)
 - Modification or repair by persons unauthorized by Yokogawa.
 - Acts of God, natural disasters, insurrections or any other cause beyond Yokogawa's control.

Note that the guarantee referred to here only covers the delivered product; it does not apply to damage of any sort resulting from the failure of the delivered product.
- (2) ① This product is not designed or manufactured for use with equipment, devices, lines or processes that are operated under conditions that may directly endanger human body in the event that the product is broken or damaged — such as nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, marine facilities, aviation facilities, medical equipment or medical manufacturing devices. If used for such purposes, it is the user's responsibility to ensure the safety measurement if the product is broken or damaged.
 - ② Please contact our sales department for further inquiries.
- (3) Exemption from liability
 - ① Yokogawa Electric Corporation (hereafter "Yokogawa Electric") makes no warranties regarding the product except those stated in the WARRANTY in this user's manual.
 - ② In no event shall Yokogawa Electric be liable for any indirect or consequential damages, such as loss of profit, business interruption, loss of data, recall and the like, caused by the product. In the event that Yokogawa assumes responsibility, liability to pay damages is limited to the amount paid by the user for the product that caused the damage.
- (4) This information in this user's manual is subject to change without notice.

Revision Record

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Edition	Date	Page	Revised Item
1st	July 2002	—	New Publication.
10th	July 2021	— 2	Format change to Windows InDesign. Update EMC standards and add EU RoHS directive. Add China RoHS information.
11th	March 2023	1	Change the Max. cyclic load value for Code 2 and 3.