Pressure Transmitter

■ General

Model PY7100A pressure transmitter is a small pressure transmitter using a semiconductor strain gauge.
It detects the pressure of chilled/hot water, brine, lubricating oil, steam, air, and other fluids, and converts measured values into 4 to 20 mA DC electric signals for the purpose of measuring and controlling the pressure.

■ Features

(1) A small and highly precise pressure transmitter using a semiconductor strain gauge.
(2) This pressure transmitter detects the pressure of brine, lubricating oil, air, steam, and other fluids as well as chilled/hot water.
(3) Its wetted parts are made of stainless steel to ensure the corrosion resistance and a long life.

■ Model Numbers

Model number	Measuring range	Allowable pressure resistance*1
PY7100A3000	0 to 0.5 MPa	1 MPa
PY7100A3008	0 to 1.0 MPa	2 MPa
PY7100A3016	0 to 2.0 MPa	4 MPa

*1 The allowable pressure resistance means the pressure limit where the repeatability of measured value is assured electrically.

● Accessories

Item	Part number	Remarks
Siphon tube (equipped with cock)	FP10-T01	Allowable pressure: 3 MPa
		Allowable temperature: 200 °C or less
Siphon tube (no cock)	FP10-993	Allowable pressure: 20 MPa
		Allowable temperature: 350℃ or less
24 V DC power supply unit	QY7000C1000	Power supply: 100 V AC ± 10 %, 50/60 Hz
	QY7000C2000	Power supply: 200 V AC ± 10 %, 50/60 Hz
Seal connector	83104098-003	Cable external diameter: ⌀ 8.5 to 12.5

Safety Instructions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual near by for ready reference.

■ Usage Restrictions

This product is targeted for general air conditioning.

Do not use this product in a situation where human life may be affected. If this product is used in a clean room or a place where reliability or control accuracy is particularly required, please contact our sales representative.

Azbil Corporation will not bear any responsibility for the results produced by the operators.

■ Warnings and Cautions

⚠ WARNING	Alerts users that improper handling may cause death or serious injury.
⚠ CAUTION	Alerts users that improper handling may cause minor injury or material loss.

■ Signs

	Alerts users possible hazardous conditions caused by erroneous operation or erroneous use. The symbol inside △ indicates the specific type of danger. (For example, the sign on the left warns of the risk of electric shock.)
	Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside ⃠ graphically indicates the prohibited action. (For example, the sign on the left notifies that disassembly is prohibited.)
	Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside ● graphically indicates the actual action to be carried out. (For example, the sign on the left indicates general instructions.)

⚠ WARNING	
	Before wiring or maintenance, be sure to turn off the power to this product. Failure to do so might cause electric shock or device failure

⚠ CAUTION	
	Use the product under the operating conditions (temperature, humidity, power, vibration, shock, mounting direction, atmospheric condition, etc.) as listed in the specifications.
	Use this product within the lifespan given in the specifications and avoid instrumentations that keep the product to operate excessively. Continued use beyond this lifespan might cause
	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
	All wiring must comply with applicable codes and ordinances.
	Do not put load or weight on the product. Doing so might damage the product.
	To connect the wires to the screw terminals, use crimp terminal lugs with insulation. Failure to do so might cause short circuit or electric shock.
	Do not disassemble the product. Doing so might cause electric shock or device failure.
	When the transmitter is used for measuring high temperature fluid, do not touch the siphon tube unnecessarily. If you touch it, you may get burned.
	Dispose of the product as industrial waste in accordance with your local regulations. Do not reuse all or part of this product.

■ Specifications

- Pressure transmitter

Item		Specification	
Detection method		Semiconductor strain gauge	
Measuring object		Chilled/hot water, lubricating oil, brine, steam, air, and other fluids (The part that contacts with fluids should not be corroded.)	
Operating temperature		-20 to 70 °C (without freezing)	
Output signal	4 to 20 mA DC	Linear output characteristic	
	Load resistance	Max. 500 Ω	
Accuracy		± 0.5 % FS, including linearity and hysteresis	
Influence of ambient temperature fluctuation		± 0.05 % FS/°C	
Zero and span adjusting range		Zero: 10 % FS	
		Span: 20 % FS	
Supply power		24 V DC ± 10 % (with over-load protection function)	
Power consumption		Approx. 0.5 VA	
Insulation resistance		50 V DC, 100 MΩ (between terminal and case)	
Withstand voltage		250 V AC, 1 min	
Environment conditions		Rated operation conditions	Transportation/storage conditions
	Ambient temperature	-20 to 70 °C	-30 to 80 °C
	Ambient humidity	5 to 95 % RH (without condensation) Indoor mounting type	5 to 95 % RH (without condensation)
	Vibration resistance	20 m/s² (10–150 Hz)	20 m/s² (10–150 Hz)
Case structure		Splash-proof type (IEC 60529) (with sealed connectors)	
Weight		Approx. 370 g	
Material, surface coating color	Case, cover	Aluminum diecast Silver	
	Wetted parts	Stainless steel	
Connection system		R1/2 (male screws)	

- 24 V DC power supply unit

Item		Specification	
Output voltage		24 V DC ± 5 % (at the rated load (0.13 A) and at no load)	
Over-load protection		Power disconnection system, automatic recovery	
Environment conditions		Rated operation conditions	Transportation/storage conditions
	Ambient temperature	-10 to 50 °C	-20 to 60 °C
	Ambient humidity	85 % RH (without condensation)	95 % RH (without condensation)
Mounting		Mount in panel (vertically or horizontally)	

■ Dimensions

- Pressure transmitter

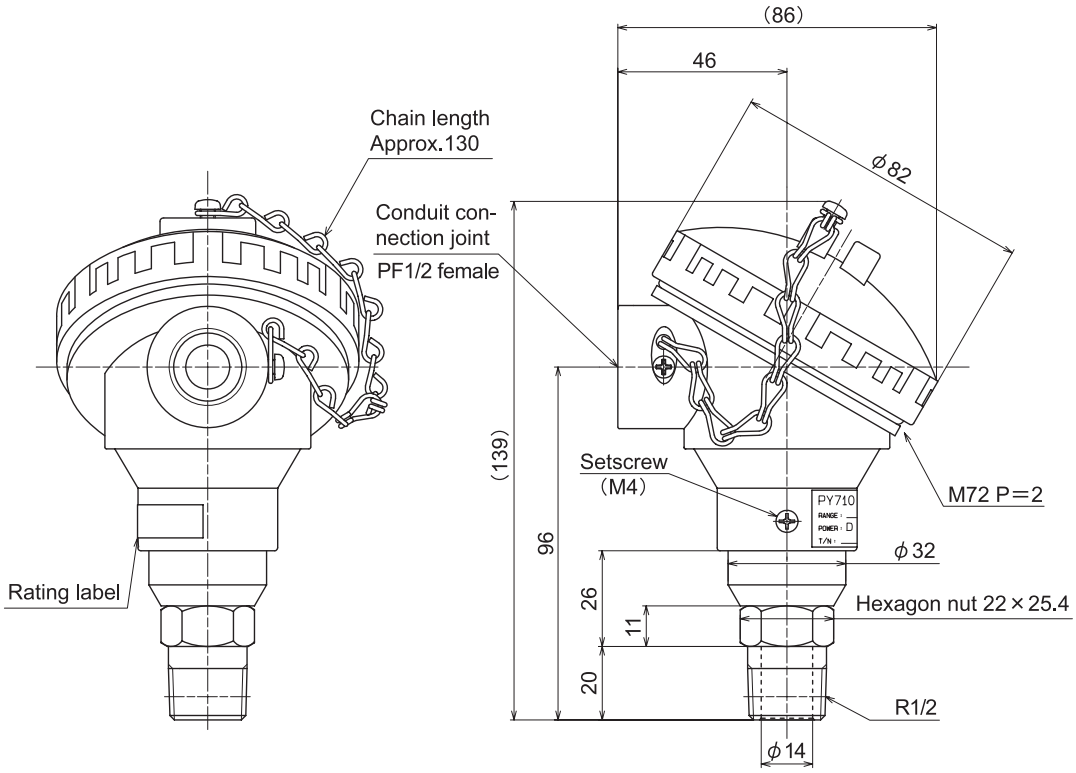


Figure 1 Pressure transmitter (mm)

- Siphon tube (equipped with cock)

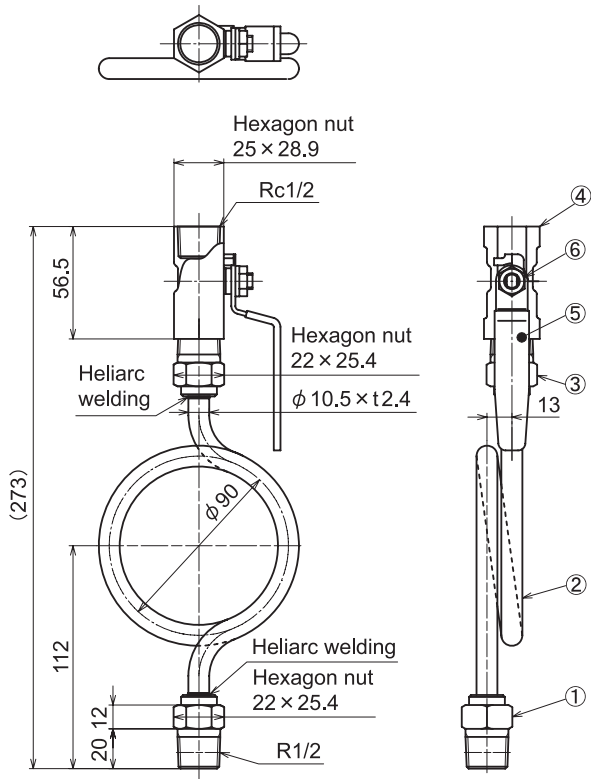


Figure 2 Siphon tube (equipped with cock) (mm)

- Siphon tube (no cock)

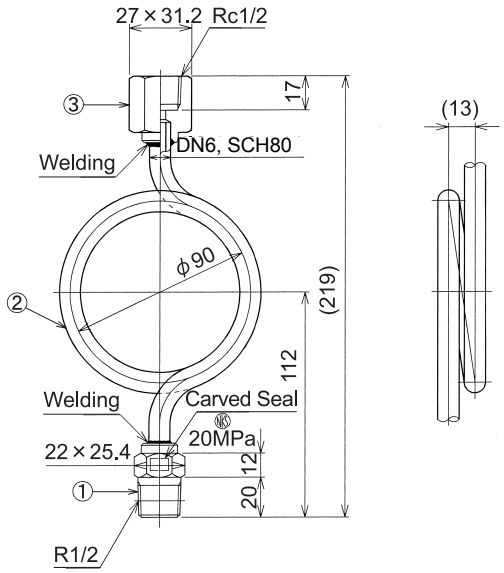


Figure 3 Siphon tube (no cock) (mm)

Table 1 Materials of siphon tube (equipped with cock)

No.	Part	Material	Remarks
1	Joint	Stainless steel	
2	Pipe	Stainless steel	
3	Joint	Stainless steel	
4	Body	Stainless steel	Lost wax
5	Handle	Stainless steel	Plastic-jacketed
6	Nut	Stainless steel	

Table 2 Materials of siphon tube (no cock)

No.	Part	Material	Remarks
1	Joint	Stainless steel	
2	Pipe	Stainless steel	
3	Union nut	Stainless steel	

- 24 V DC power supply unit

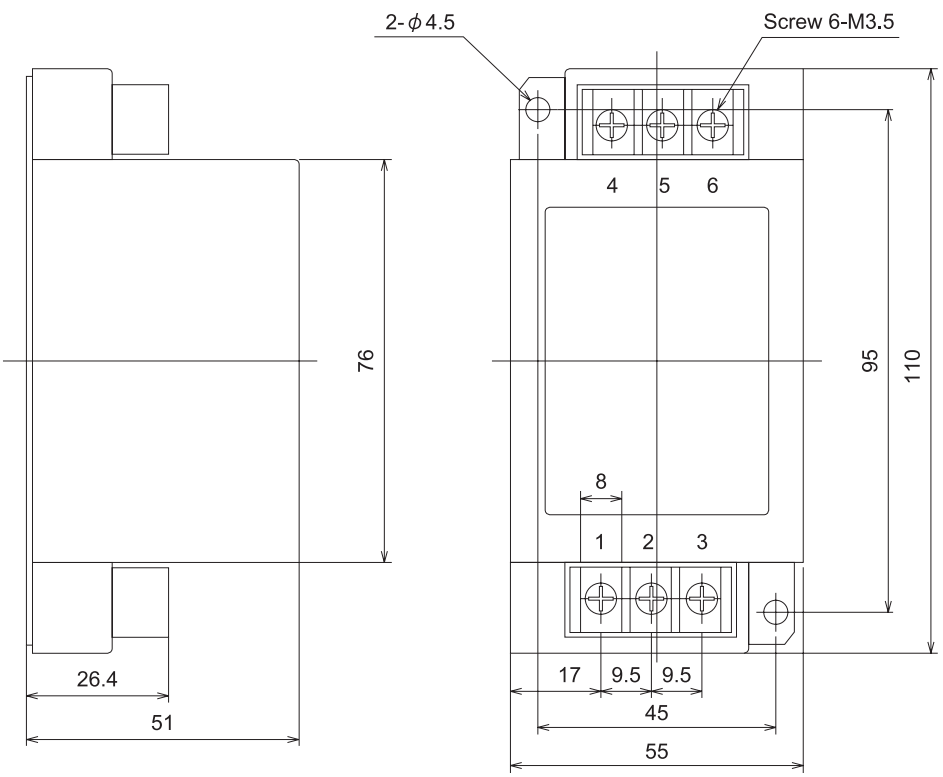


Figure 4 Terminal dimensions

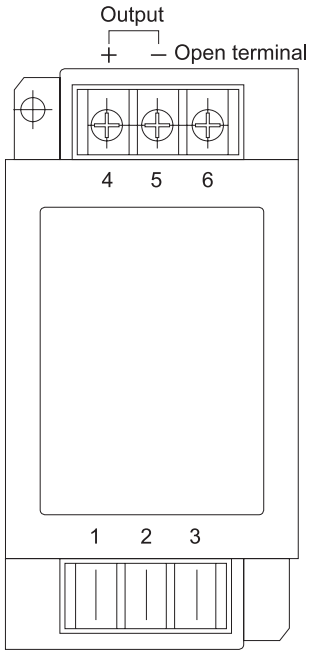


Figure 5 Terminal layout

■ Installation

⚠ CAUTION
Use this product under the operating conditions (for temperature, humidity, power, vibration, shock, mounting direction, atmosphere, etc.) listed in the specifications. Failure to do so might cause fire or device failure.
Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.

● Installation place

IMPORTANT:

- Mount this transmitter indoors where the ambient temperature is –20 to 70 °C and the humidity is 95% RH or less. (No condensation is allowed. Measuring objects shall be free of being frozen.)
- For measuring steam, keep the ambient temperature of transmitter at 70 °C or less by lengthening the siphon tube and connection pipe, etc.
- Keep a space enough for maintenance and adjustment around the transmitter.
- If the transmitter is mounted on a pipe in which cryogenic fluid (e.g., chilled water, brine) flows, the sensor part may be condensed and damaged.
  Be sure to use the siphon tube to prevent condensation.
- If the siphon tube is used in a vibration environment, protect the tube with a supporting structure, etc. from excessive force by vibration.

● Checking items

- Be careful not to drop or shock the product during transportation, unpacking, and installation.
- Check that the model number of the transmitter delivered to you is the model number you ordered.
- To install the transmitter to a pipe, install it with a pressure gauge as shown in Figure 6.
- Be sure to install a stop valve for maintenance.
- For measuring cryogenic fluid with the transmitter, arrange to keep the transmitter temperature around its ambient by using the siphon tube, etc.
  This prevents a damage on the transmitter due to condensation.
- Mount the transmitter in the position ranging from vertically upright to ±90°.
  However, if the siphon tube is used, mount it vertically.
- If the transmitter is used in a vibration environment, protect the facilitating pipe and siphon tube with a supporting structure, etc. from excessive force by vibration.
- Never apply heat insulator for the siphon tube.

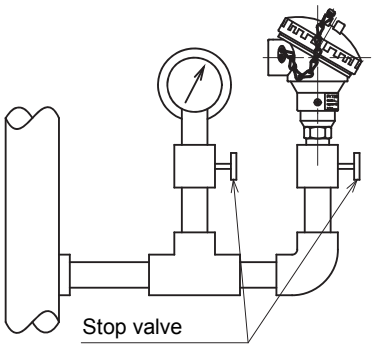


Figure 6 Installation (attached to pipe)

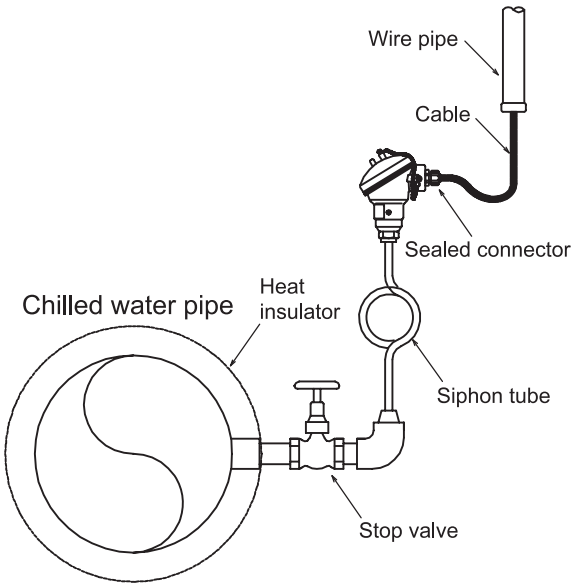
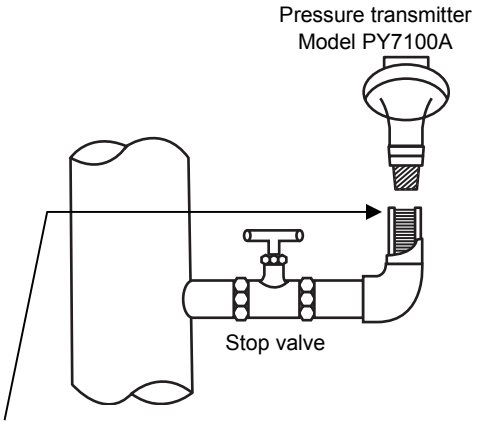


Figure 7 Installation (attached vertically)

● Installation procedure

(1) Prepare a pressure outlet on the pipe (Figure 8).
(2) Mount a stop valve and make a R1/2 female screw.
(3) Screw the transmitter unit in the pressure outlet.



If the pressure transmitter is screwed in the outlet filled with measuring fluid, a pressure of 7 to 10 MPa will be applied to the pressure transmitter and the reproducibility will be lost. Provide an air layer of minimum 30mm before screwing in the pressure transmitter.

Figure 8 Note for installation

■ Wiring

⚠WARNING

Before wiring or maintenance, be sure to turn off the power to this product.
Failure to do might cause electric shock or device failure.

⚠ CAUTION

Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.

All wiring must comply with applicable codes and ordinances.

To connect the wires to the screw terminals, use crimp terminal lugs with insulation.
Failure to do so might cause short circuit.

When the transmitter is used for measuring high temperature fluid, do not touch the siphon tube unnecessarily.
If you touch it, you may get burned.

IMPORTANT:

- For wiring, use an indoor vinyl cable (thicker than IV 1.25 mm²). Wiring length is maximum 20 m.
- Use a shielded cable, if the transmitter is presumable to be affected by noises and other interferences through the wiring route.
  Connect the signal receiving instrument to the ground.
- For the wiring method, refer to Figure 9.
- If this product is used for measuring pressure of 1 MPa or less, atmosphere is supplied through the cable, so do not seal the cable end.
- Use the sealed connectors to ensure splash-proof.

- Strip the cable sheath about 80 mm and the core wire sheath in accordance with the M3 crimp terminal lug that you use.
- Crimp the terminal lugs on the end of the core wires. Shield the cable at the end of the sheath.
- Remove the lid of the terminal box and insert the cable through the inlet deeply into the gasket.
- Tighten the seal connector and seal the terminal inlet.
- Connect the wires to the terminal posts.
- Cover the terminal box with the lid to seal.

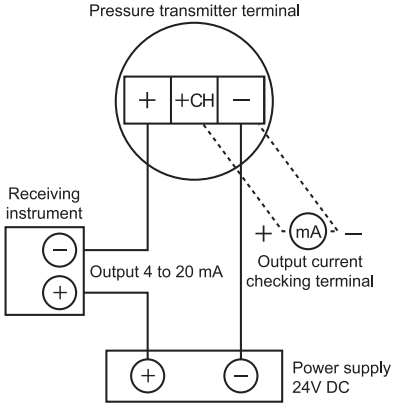


Figure 9 Wiring diagram

■ Adjustment

IMPORTANT:

- This transmitter has been precisely adjusted, before the shipment from the factory, so that the transmitter outputs the 4 to 20 mA signals in response to the detection range.
- No adjustment is required for normal uses.
  If you change the relation between the detection range and output signals, or if you set the relation precisely, adjust the transmitter by using a pressure pump and a precision pressure gauge.
- Output signals can be checked across the "+ CH" and "-" terminal using an ammeter of 10 Ω or less.
  (See Figure 10.)
- If the output signals pulsate, compensate the pulsation using the filtering function on the controller.
  If your controller does not have the filtering function, use a dampener for compensation.

- Zero adjustment

  (1) Close the stop valve and remove the pressure transmitter from the pipe.
  (2) Open the pressure receiving part to the open air, and adjust the ZERO control knob (Z) so that the output signal becomes 4 mA.
  Turn the knob clockwise to increase the output signal. The adjustable range is 10 % FS.

- Span adjustment

  (1) Close the stop valve and remove the pressure transmitter from the pipe.
  (2) Apply the high-limit pressure of the detection range by using a pressure pump.
  Adjust the span control knob (S) under this condition so that the output signal becomes 20mA.
  Turn the knob clockwise to increase the output signal. The span adjustable range is 20% FS.

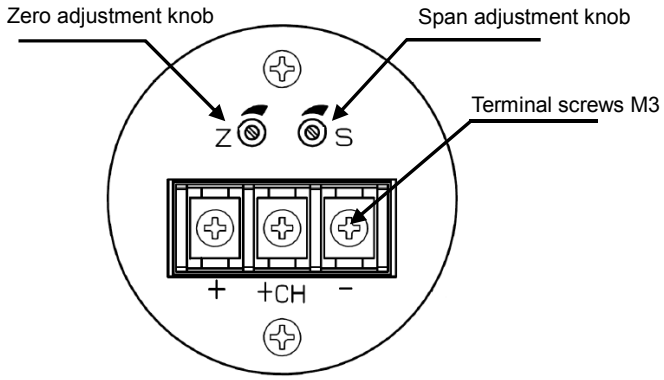


Figure 10 Terminal box layout

■ Operation

- Check that the pressure range of the product is correct.
- Check that all the screws are tightened.
- Before supplying power, check that all the wirings are correct.
  Check that the pressure transmitter is mounted correctly and open the stop valve.
- Check that the rated voltage and current of the power supply unit, and the inner resistance of the devices connected externally are within the rated range of the transmitter.
- After power on, allow minimum 5 min warm-up operation. Then, start the normal operation.

■ Maintenance

⚠ CAUTION

When the transmitter is used for measuring high temperature fluid, do not touch the siphon tube unnecessarily.
If you touch it, you may get burned.

IMPORTANT • Before removing the pressure transmitter, close the stop valve.
Failure to do so may cause spurting of the liquid from the pipe and you may get injured.

Although there is no moving element in this product's sensor part, inspect the transmitter according to your usage. Inspection items are described below.

Item	Inspection cycle	Inspection method
Loose terminal screws	6 months	Check that terminal posts for the transmitter, power supply, and signal receiving instrument are screwed tightly.
Leakage of liquid	6 months	Check that there is no leakage around the joints and sealed parts.
Insulation resistance between the terminals and case	6 months	Check that the resistance is 100 MΩ or more at 50 V DC.
Output check using the pressure reference meter and ammeter	6 months	Check that zero point output is 4 mA DC, span output is 20 mA DC.

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Specifications are subject to change without notice.

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