

Electronic pressure switch for air

■ Sensors / pressure sensor

Overview

Air pressure is electrically detected, displayed and outputted.

Features

Various sort

Wide variation is available from small sensor to display.



C O N T E N T S

Series variation	1070
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Sensor, amplifier integrated type

● PPE without display (sensor/amplifier integrated type)	1090
● PPE-*A without display analog output type (sensor/amplifier integrated type)	1093
● PSW without display (sensor/amplifier integrated type)	1096
● PPX with digital display (sensor/amplifier integrated type)	1100
● PPD3 with display (sensor/amplifier integrated type/separate type)	1124
● PPD3-S with display (stainless steel diaphragm sensor type) (sensor/amplifier integrated type/separate type)	1124
● PPD with display (sensor/amplifier integrated type)	1140
● PPD-S with display (stainless steel diaphragm sensor type) (sensor/amplifier integrated type)	1144
● PPD-A with display (with protection box) (sensor/amplifier integrated type)	1146
● PPS2 with display (sensor/amplifier integrated type/separate type)	1150
● PPS2 pressure controller (sensor/amplifier integrated type/separate type)	1154
● DP1000 electronic differential pressure switch (sensor/amplifier separate type)	1158

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

● = Available in lineup
 — = Not available in lineup

*1: Main unit front operation section only *2: Custom order *3: Select with model

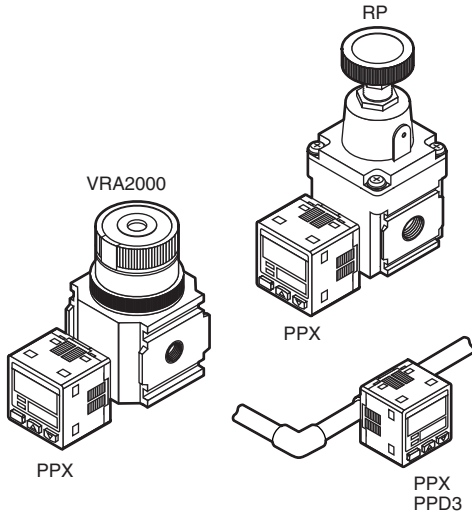
Model	Type	Pressure range (kPa)								Protective structure	Switch output (point) *3			Working fluid	Installation method								Indicator		Page		
		Sensor, amplifier integrated type	Sensor, amplifier separate type	0 to 980 (1000)	0 to 98 (100)	0 to -100 (-101.3)	-100 to 980 (1000)	-100 to 300	-100 to 100		-101 to 500	NPN	PNP		Analog	FR installation	Panel mount	Others (bracket installation, etc)	Connecting port							Digital display	Only output light
																			Rc 1/8	R 1/8	Push-in	Plug	M5 female thread	NPT 1/8			
 PPE Trimmer setting type semiconductor pressure switch developed for pneumatic/vacuum circuits. Usage is flexible due to small and 3 types of connecting ports.	● —	●	●	●	—	—	—	—	—	IP65	● (2 wire) (1)	—	—	Air Non-corrosive gas	—	—	—	—	●	●	●	—	—	—	●	1090	
 PPE-A Semiconductor pressure sensor developed for pneumatic/vacuum circuits. 1 to 5V output (analog output) is proportional to impressed pressure.	● —	●	●	●	—	—	—	—	—	IP65	—	—	● (1)	Air Non-corrosive gas	—	—	—	—	●	●	●	—	—	—	● (At energized)	1093	
 PSW Reliable pressure switch developed for pneumatics/vacuum circuits. Semiconductor sensor is used, high precision / high speed response.	● —	●	●	●	—	—	—	—	—	IP40	● (1)	—	● (1)	Air Non-corrosive gas	—	—	●	—	—	—	—	—	—	—	●	1096	
 PPX Digital pressure sensor with twin display of current and set pressure values confirmed simultaneously, a tricolor indicator, setting detail copy function, and three mode settings. This sensor provides to ease of use and high functionality.	● —	—	—	—	● (1000)	—	●	—	—	IP40	● (2)	● (2)	—	Air Non-corrosive gas	Attached	●	●	●	●	●	●	—	—	—	—	—	1100
	—	—	—	—	—	—	—	—	—		● (1)	● (1)	● (1)			—	—	—	—	—	—	—	—	—	—	—	
 PPD3 Optimum digital indicator pressure switch for pneumatic lines. Due to various port options, adsorption confirmation / contact confirmation, etc. can be flexibly operated.	● —	—	—	—	●	●	●	—	—	IP65 (IP40 for indicator section)	● (2)	● (2)	—	Air Non-corrosive gas	—	●	●	●	—	—	—	—	—	—	—	—	1124
	—	●	—	—	—	—	—	—	—		● (1)	● (1)	● (1)			—	—	—	—	—	—	—	—	—	—	—	
 PPD3-S Pressure switch with digital display stainless steel diaphragm is used for sensor section.	● —	—	—	—	●	●	●	—	—	IP65 (IP40 for indicator section)	● (2)	● (2)	—	Air/non-corrosive gas (Including drain and oil) Compressed air	—	●	●	●	—	—	—	—	—	—	—	—	1124
	—	●	—	—	—	—	—	—	—		● (1)	● (1)	● (1)			—	—	—	—	—	—	—	—	—	—	—	
 PPD 28mm square miniature switch with digital pressure display for pneumatic/vacuum circuits.	● —	●	●	●	—	—	—	—	—	IP40	● (1)	● (1)	—	Air Non-corrosive gas	●	●	●	●	●	—	—	—	—	—	—	●	1140
 PPD-S Stainless steel diaphragm is used for sensor section. For vacuum, withstanding pressure is 3-fold reinforced.	● —	●	●	●	—	—	—	—	—	IP40	● (1)	● (1)	—	Air/non-corrosive gas (Including drain and oil) Compressed air	—	●	●	●	—	—	—	—	—	—	—	●	1144
 PPD-A Equivalent to protective structure IP67, pressure switch with digital display in protective box allowing operation by a wet hand.	● —	●	●	●	—	—	—	—	—	IP67	● (1)	● (1)	—	Air Non-corrosive gas	—	—	●	—	—	—	—	—	—	—	●	1146	
 PPS2 Digital measurement display detecting air pressure/vacuum precisely. 4 point switch output allows wide applications.	● —	●	●	●	—	—	—	●	—	None (IP66 by option (*1)) No body (IP66 by option (*1)) Sensor section: IP67	●	—	—	Air Non-corrosive gas	—	●	—	—	—	—	—	—	—	—	—	●	1150
	—	●	—	—	—	—	—	—	—		—	● (Not polarized) (4)	● (1)			—	—	—	—	—	—	—	—	—	—	—	

Electronic pressure switch

Applications of pressure switch

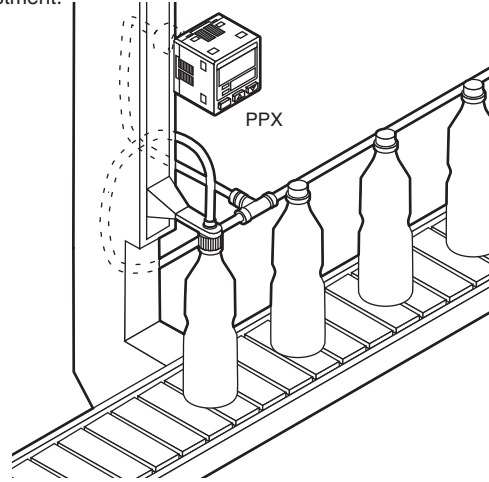
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Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

● Positive pressure / vacuum confirmation and interlock

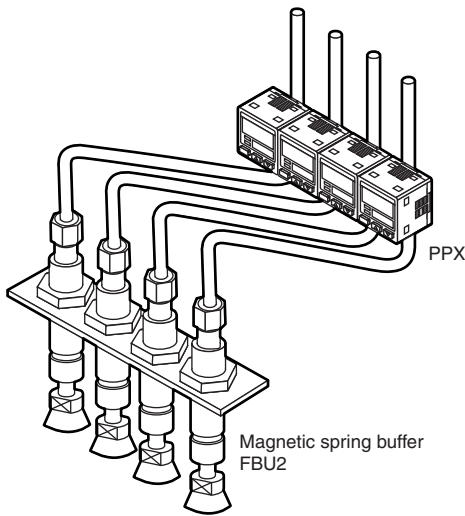


● High-function type

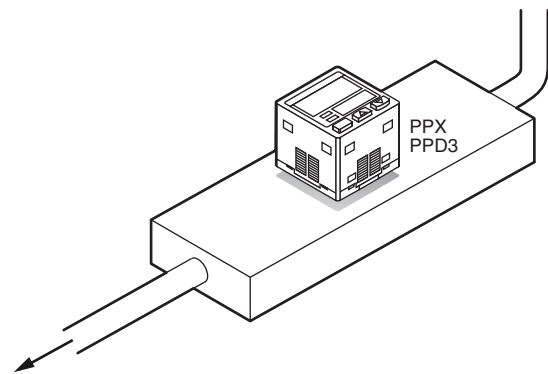
- Settings are made easy with automatic reference and remote zero adjustment.



● Manifold

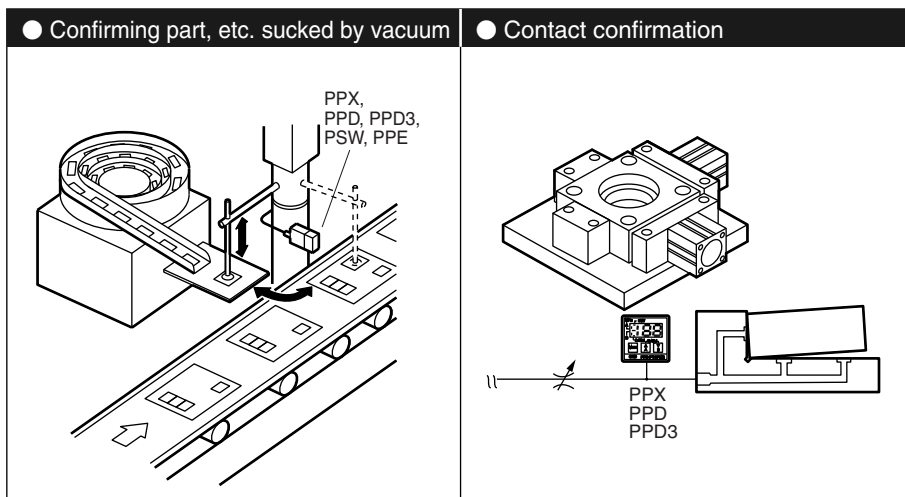
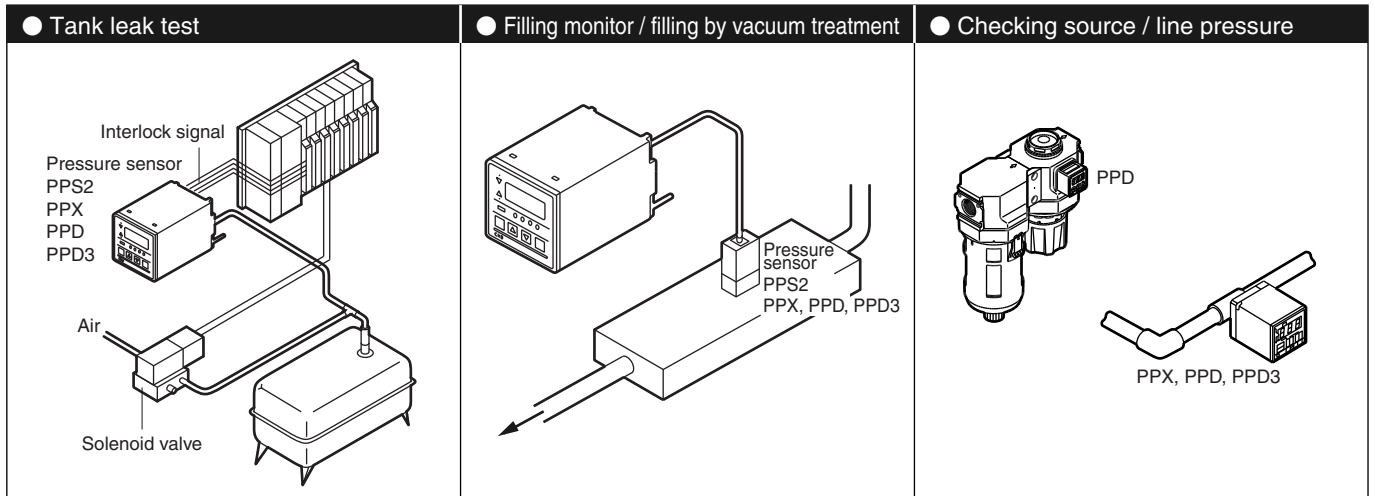


● Attain vacuum and break pressure with one unit



Electronic pressure switch

Applications



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Ending

Electronic pressure switch
Pressure sensor



Pneumatic components (electronic pressure switch and sensor)

Safety precautions

Always read this section before starting use.

Refer to Intro 67 for general precautions, and to "▲ Safety precautions" in this section for details on each series.

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Ending

Design & Selection

▲ WARNING

■ Use this product in accordance of specifications.

- Use for applications, or at load currents, voltages, temperatures, impacts or sites excluded from the specifications could result in damage or malfunctions.

■ Do not use oxygen, corrosive or combustible gas, or toxic fluid for this product.

■ Do not use this product in flammable atmosphere.

- The pressure switch does not have an explosive-proof structure. Never use in an explosive gas environment as explosions or fires could result.

■ Avoid installing this product in a sealed control box or indoors.

- If the fluid should leak due to any trouble, the pressure in the sealed chamber could change and recreate a hazardous state. Use this product in the control box having safety device to control internal pressure, or indoors with no pressure differential from the outside.

■ Power voltage

Use the product within the specified power voltage range. The product could rupture or burn if voltage exceeding the working range is applied or if an AC power supply (100 VAC) is applied.

■ Load short circuit

Do not short-circuit the load. Failure to observe this could result in rupture or burning.

■ Incorrect wiring

Avoid incorrect wiring such as wrong polarity of power source, etc. Failure to observe this could result in rupture or burning.

▲ CAUTION

■ Working fluid

When using working fluid other than air; nitrogen gas, etc., oxygen deficiency could be caused. Observe the following instructions.

- Use this product in well ventilated locations.
- Ventilate the work area when nitrogen gas is being used.
- Inspect piping regularly, so nitrogen gas piping does not leak.
- Non-corrosive gas means substances such as nitrogen or carbon dioxide contained in air and inert gases such as argon or neon.
- When using this product for compressed air containing water or oil, use the PPD(3)-S (stainless steel diaphragm sensor specifications) with increased corrosion resistance.

■ If this product is used for vacuum suction confirmation, care must be taken for following matters.

- When applying positive pressure for vacuum break onto the product, check that it does not exceed the specified withstand pressure.

■ Working environment

- Avoid using this product where vibration or impact exceeding 100m/s² could be applied.
- Check the temperature of fluid being measured and the environmental temperature in piping.
- When using a type that does not have the corresponding protective structure, do not use for applications in which water or oil could be applied.

■ Determine the setting taking error caused by accuracy and temperature characteristics into consideration.

■ Take care when using this product for an interlock circuit.

- When using the pressure switch for an interlock signal required high reliability, provide a double interlock by installing a mechanical protection function or a switch (sensor) other than a pressure switch as a guard if problems occur. Execute inspection regularly to check that the normal operation is done.

(Recommended value)

Model	Protective structure
PPX/PPD/PPD-S	IP40
PPE(-A)/PPD3(-S)	IP65
PPS2 front controls (option)	IP66
PPD-A/PPS2 sensor's separate sensor section only	IP67

■ Response is affected by working pressure and load volume. If repeatability with stable responsiveness is required, install a regulator in the proceeding stage.

■ Take the following countermeasures to prevent malfunction caused by noise.

- Insert a line filter in the AC power supply line.
- Do not share power with an inverter or components causing motor noise, etc.
- Use a surge suppressor, such as a CR or diode on the inductive load (solenoid valve, relay, etc.), and remove noise where generated.
- When using a device such as a switching regulator or inverter motor that could generate noise near the sensor, be sure to ground the device frame ground (F.G.) terminal.
- Separate wiring to the sensors from strong magnetic fields.
- Connect wiring to sensors with a shield wire.
- Ground the shield wire on the power supply side.

■ When the secondary side control pressure is released to atmosphere as air blow, pressure may fluctuate depended on piping and blow conditions. Execute a test under actual working conditions or contact to CKD.

■ Select the product whose flow is not less than the total of that used for sensors when selecting a dryer, an air filter, an oil mist filter and a regulator.

Installation & Adjustment

⚠ WARNING

- Avoid incorrect connection.
 - An incorrect connection may cause a fatal error not only to this product but also peripheral devices.
- DC power not insulated from AC primary side may damage the product and power, so an electric shock could occur. Do not use the product in this case.

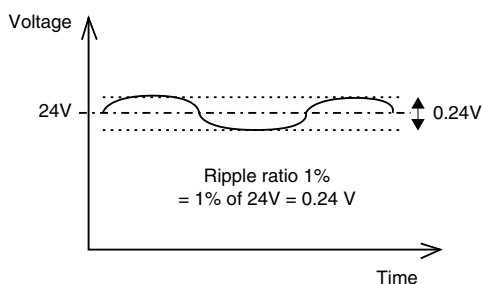
⚠ CAUTION

- Do not use the product where the product is exposed to direct-sunlight or may come in contact with water or oil.
- Flash air pipe connected to sensors before connecting. Prevent pipe from catching tips of sealing tape when piping.
- Correct pressure control is not possible if the exhaust port is plugged. Release this port into the atmosphere.
- Apply adequate torque when connecting pipes.
 - To prevent air leakage and screw damage.
 - First tighten the screw by hand to prevent damage to screw threads, then use a tool.

Port thread	Tightening torque N·m
M3	0.3 to 0.6
M5	1 to 1.5
Rc1/8	3 to 5
Rc1/8 (resin)	1 to 1.5



- Care must be taken for protection of body and lead wire.
 - Do not bump or drop the main unit, or apply excessive bending or tensile strength to the lead because the lead could be disconnected.
 - Connect and wire bending-resistant material, such as robot wire material, for the movable sections.
- Wiring
 - Turn power OFF before wiring this product. Discharge static electricity charged in human body, tool or equipment before and during operation.
 - Use a stabilized noise-free power supply with a ripple voltage of 1% or less.

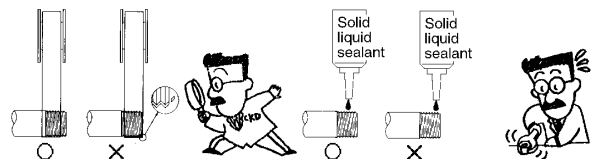


- Turn the power on and off at the quick rising and falling edges of voltage.
If the rated voltage is not reached, the sensor could malfunction. In some cases, the sensor could not recover after the rated voltage is reached. Reset the power in that case. Even if the voltage drops temporarily, shut down the power once, then turn ON the power again.
- Install the product and wiring as far as possible from noise source such as a strong electric line. Take separate measures against surge generated from inductive loads that enter the power supply.
- Do not operate the control unit, machinery or equipment immediately after wiring. Due to wrong setting, signals not expected could be outputted. First stop control unit, machinery and equipment, while energize these to test. Set the target setting after test.

- Stop machinery and equipment, and check safety before setting switch output.
- Operate keys manually. Sharp instruments, such as knives or screwdriver, contacting plastic film on the operation section could damage film and compromise its protective functions.

■ Piping

- Use the recommended tube for the push-in joint, and connect to the assembled push-in joint after flushing.
 - * Recommended tube: 6mm O.D. CKD F-1506, U-9506, etc.
- Apply seal tape or sealant on the threaded joint, and screw in while taking care not to tighten excessively. Apply a spanner on the metal section to tighten. (Only PPE and PPD-R * D-6 have a resin section)
- When winding sealing tape, wind from 2mm and over inward from the end of threads on the pipe.
 - * If sealing tape protrudes from the end of pipe threads, it could be cut when the joint is screwed in and cut pieces could get inside and cause problems.



- Limit the pipe length to 1m, and check that excessive tensile strength or impact is not applied. If the tube is too long, unpredicted tensile strength could be generated from tube weight, and by vibration and impact. Fix or relay the tube to the machine or equipment midway so that tube weight is not applied.

- Avoid connecting the output for a relay contact, operation switch, or other component output in parallel with the PC to the product's output, or short-circuit the input terminal of the PC to which this product is connected with the power supply cable's minus side to test the input device, or the output circuit of this unit could be damaged.

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Ending

Electronic pressure switch
Pressure sensor

Installation & Adjustment

CAUTION

- Some models have a push in joint for the measured pressure port. Check the perpendicularity of the tube side, and check that there are no scratches, indents, or dirt near the end. Air and compressed air are measured. Check that water and dirt do not enter the tube during piping.

During Use & Maintenance

WARNING

- Do not apply overcurrent.
 - If overcurrent flows to the pressure switch because of a load short circuit, etc., the pressure switch will be damaged and could also ignite. Provide an overcurrent protection circuit, such as a fuse, for the output wire and power cable.

CAUTION

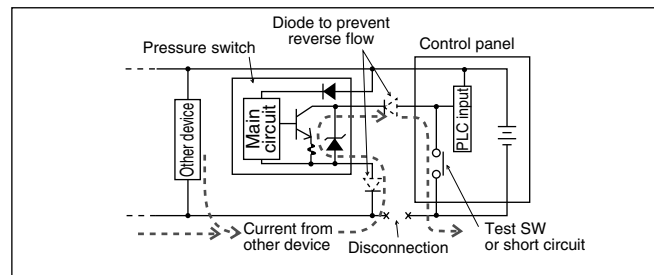
- Do not disassemble the products.
 - The product could be damaged or performance compromised if this product is disassembled. CKD does not guarantee performance after disassembly. Remove the entire installation section (pressurized port section) when replacing or moving this product.
 - With the PPD-* -IF-* type, the case must be removed during initial assembly. Take special care in handling. (Be sure to follow assembly methods and precautions given in the instruction manual enclosed with the product.)

- Stop machinery and equipment, then check the safety before operating the product.

- With PPD/PPD3/PPS2, pressure is detected 200 times per second, but this display is updated 4 times a second, and cannot track fast pressure changes. The switch could therefore start operating at quickly changing pressure even when the display does not indicate the switch setting.

- The case is made of resin. Do not use solvent, alcohol, or detergent in cleaning, or resin could absorb it. Wipe contaminations with a well wrung rag, etc., after soaked in weakened neutral detergent.

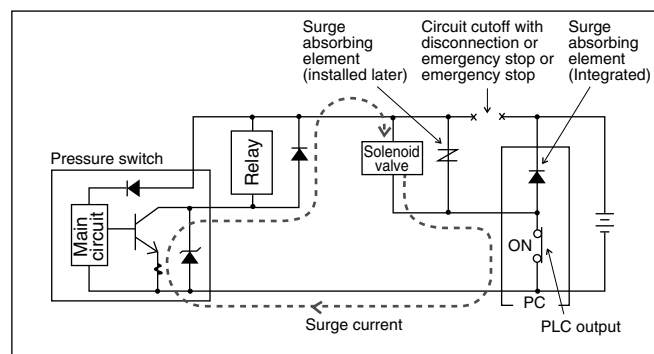
- Care must be taken for disconnection and reverse current caused by wiring resistance. When other devices, including pressure switches, are connected to the same power supply as the pressure switch, and the output cable and power cable's minus side are short-circuited or the power supply's minus side is disconnected to check operation of the input device from the control panel, reverse current could flow to the pressure switch's output circuit and cause damage.



Take countermeasures as followings to prevent damages caused by reverse current.

- Avoid centralizing current at the power cable, especially the minus side power cable, and use as thick as possible.
- Limit the number of devices connected to the same power supply as the pressure switch.
- Insert a diode in serial with the pressure switch's output cable to prevent reversal of current.
- Insert a diode in serial with the pressure switch's power cable minus side to prevent reversal of current.

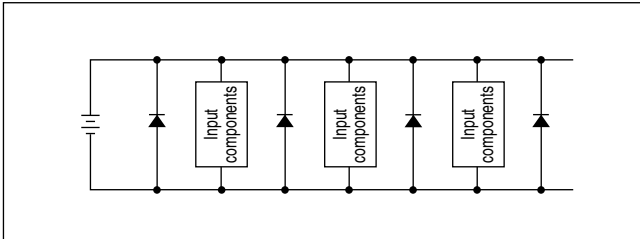
- Care must be taken for surge current leading. When the power is shared with inductive loads that create surge current such as pressure switches, solenoid valves or relays, if the circuit is closed with inductive loads activated, surge current could lead to the output circuit, causing damages.



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Total air system
Total air system (Gamma)
Ending

Take countermeasures as followings to prevent damage caused by surge current leading.

- (1) Separate the power supply for the output system comprising the inductive load, such as the solenoid valve and relay, and the input system, such as the pressure switch.
- (2) If separate power supplies cannot be used, directly install a surge absorption element for all inductive loads. Remember that the surge absorption element connected to the PLC, etc., protects only that device.
- (3) Connect a surge absorption element to the following places on the power wiring as shown below as a measure against disconnections in unspecified areas:



When components are connected with connectors, if a connector is dislocated during energizing, the output device could be damaged because of the reason above. Turn off the power before dislocating a connector.

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Ending

Electronic pressure switch
Pressure sensor

Electronic pressure switch PPE Series

Design & Selection

⚠ WARNING

- The main body and joint connection rotate, but this section should not repeatedly rotate during use.
- The protective structure is equivalent to IP65, but this product must not be used in an environment where it could come in contact with water. Check that cutting oil and coolant do not come in contact.
- Care must be taken for internal voltage drop.
 - When using with a voltage less than specified voltage, the pressure switch may be activated correctly, but the load may not function correctly. Check the load's working voltage, and check that the following expression is satisfied:
Power voltage – internal voltage drop > load working voltage

■ Care must be taken for leakage current.

- Even when the 2-wire pressure switch is OFF, current (leakage current) flows to operate the internal circuit. (1mA or less)

Load working current > leakage current

If the above expression is not satisfied, the switch may be interpreted as ON even when it is OFF, and operation fail. Use the 3-wire PPD if specifications are not met. If n units are connected in parallel, the current that flows to the load increases n-fold.

- The customer is responsible for checking safety and taking appropriate means for using fluids other than applicable fluids. Do not use this product for corrosive or flammable gases or for oxygen.

Installation & Adjustment

⚠ CAUTION

■ Handling the product

- When installing the product, hold the body while taking care not to bang the unit or apply excessive stress to loads.
- Do not disassemble or overhaul the product. If disassembled, parts could pop off when pressure is applied. CKD does not guarantee performance after disassembly.

■ Load short circuit protection circuit

- If the load is inadvertently short-circuited, the internal load short-circuit protection circuit is activated and the switch remains OFF. Fix wiring, then turn power OFF, or shortcircuit the PPE's brown and blue wires to recover normal switch operations.

<Cautions on installation>

■ Driver

Use a flat-tip screwdriver that fits into the trimmer slot (0.5W × 2.3L × 0.5D) when setting.

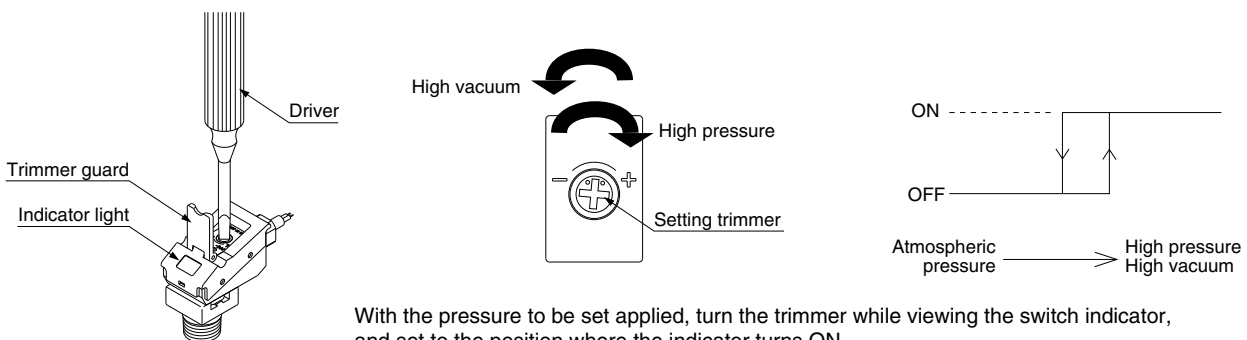
■ Trimmer

The rotation range of the trimmer is 240 degree. The trimmer could be damaged if turned any further or if turned forcibly.

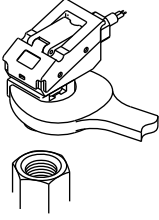
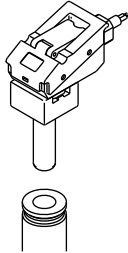
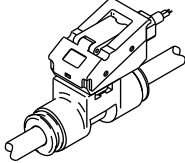
■ Opening and closing the trimmer cover

Use a flat-tip screwdriver to open the trimmer cover and set the trimmer. After setting, press the trimmer cover with a finger and completely close it. The protective structure (IP65) is not satisfied if the cover is not completely closed.

Setting pressure and switch operations



Piping method

PPE-*-6	PPE-*-H6-B	PPE-*-H6
		
<p>Use sealing tape or sealant, and catch a wrench against the cross width section (13mm) of the R1/8 joint into install.</p> <p>(Cautions)</p> <ul style="list-style-type: none"> The tightening torque is 1.0 to 1.5 N·m or less. Resin parts may be damaged if tightened too far. 	<p>Insert the CKD 6mm tube push-in joint and use.</p> <p>(Cautions)</p> <ul style="list-style-type: none"> Securely insert the plug section, and check that the plug is not dislocated. If the plug is not fully inserted, it could be dislocated or air could leak. Use the applicable push-in joint . GW Series GWJ Series 	<p>Insert the 6mm tube into the two push-in joints and use.</p> <p>(Cautions)</p> <ul style="list-style-type: none"> Use the designated tube and plastic plug. Tube outer diameter precision Nylon, soft nylon tube : Within $\pm 0.1\text{mm}$ Polyurethane rubber tube : Within $+0.1\text{mm}$ Urethane tube : Within -0.2mm Use a tube with a hardness of 93° and over. Securely insert the tube, and check that the tube is not dislocated. If the tube is not fully inserted, it could be dislocated or air could leak. Cut the tube with a dedicated cutter, and cut at a right angle.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch
Pressure sensor

Electronic pressure sensor analog output type PPE-*A Series

Design & Selection

⚠ WARNING

■ Wiring

Turn power OFF before wiring this product. Discharge static electricity charged in human body, tool or equipment before and during operation.

Connect and wire bending-resistant material, such as robot wire material, for the movable sections.

■ Installation

Install this product and wiring as far as possible from noise source such as a strong electric line. Take separate measures against surge that enter the power wire.

■ Power voltage

Use the product within the specified power voltage range. The product could rupture or burn if voltage exceeding the working range is applied or if an AC power supply (100 VAC) is applied.

■ Load short circuit

Do not short-circuit the load. Failure to observe this could result in rupture or burning.

■ Incorrect wiring

Avoid incorrect wiring such as wrong polarity of power source, etc. Failure to observe this could result in rupture or burning.

■ Connecting load

When connecting an inductive load such as relay or solenoid valve, a surge voltage is generated when the switch is turned OFF. Directly connect a flywheel diode onto all inductive loads in the same power circuit.

■ Connecting load

The output impedance of the analog output section is $1K\Omega$. If the impedance of the connected load is small, output error increases. Check error with the impedance of the connected load before using.

Example of calculation

(PPE-*A output impedance : $R_o = 1K\Omega$
Load internal impedance : $R_x = 1M\Omega$

$$\text{Output value} = \left(1 - \frac{R_o}{R_o + R_x}\right) \times 100\%$$

$$= \left(1 - \frac{1K\Omega}{1K\Omega + 1M\Omega}\right) \times 100\% \Rightarrow \text{Output error approx. } 0.1\%$$

Installation & Adjustment

⚠ CAUTION

■ When installing the product, hold the body while taking care not to bang the unit or apply excessive stress to loads.

■ The customer is responsible for checking safety and taking appropriate means for using fluids other than applicable fluids. Do not use this product for corrosive or flammable gases or for oxygen.

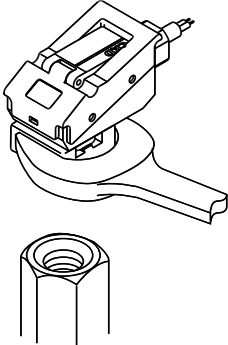
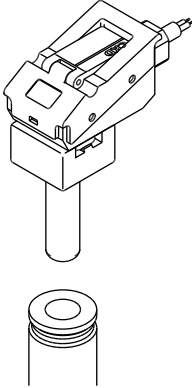
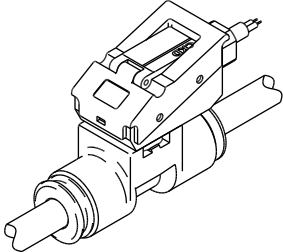
■ When applying positive pressure for vacuum break onto the product to check vacuum suction, check that it does not exceed the specified withstand pressure.

■ Do not disassemble or dismantle the product. If disassembled, parts could pop off when pressure is applied. The performance after disassembly is not guaranty.

■ The main body and joint connection rotate, but this section should not repeatedly rotate during use.

■ The protective structure is equivalent to IP65, but this product must not be used in an environment where it could come in contact with water. Check that cutting oil and coolant do not come in contact.

<Piping method>

PPE-*A-6	PPE-*A-H6-B	PPE-*A-H6
		
<p>Use sealing tape or sealant, and catch a wrench against the cross width section (13mm) of the R1/8 joint into install.</p> <p>(Cautions)</p> <ul style="list-style-type: none"> The tightening torque is 1.0 to 1.5 N·m or less. Resin parts may be damaged if tightened too far. 	<p>Insert the CKD 6mm tube push-in joint and use.</p> <p>(Cautions)</p> <ul style="list-style-type: none"> Securely insert the plug section, and check that the plug is not dislocated. If the plug is not fully inserted, it could be dislocated or air could leak. Use the applicable push-in joint . GW Series GWJ Series 	<p>Insert the 6mm tube into the two push-in joint s and use.</p> <p>(Cautions)</p> <ul style="list-style-type: none"> Use the designated tube and plastic plug. Tube outer diameter precision Nylon, soft nylon tube : Within $\pm 0.1\text{mm}$ Polyurethane rubber tube : Within $+0.1\text{mm}$ Urethane tube : Within -0.2mm Use a tube with a hardness of 93° and over. Securely insert the tube, and check that the tube is not dislocated. If the tube is not fully inserted, it could be dislocated or air could leak. Cut the tube with a dedicated cutter, and cut at a right angle.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure switch
Pressure sensor

Electronic pressure switch PSW Series

Installation & Adjustment

⚠ CAUTION

- When connecting an inductive load, install a surge suppressor within 0.5m of the load, and eliminate noise at the source.
- Load impedance of analog output must be 10kΩ and over.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Digital pressure sensor PPX Series

Design & Selection

⚠ CAUTION

■ CE-compliance working conditions

- The PPX Series is a CE-complaint product following EMC Directives. EN61000-6-2; regulation matched to immunity applies to this product. Conditions below are necessary to comply with these standards.

Conditions

- The power cable connected to the sensor must be less than 10 m long.

Installation & Adjustment

⚠ WARNING

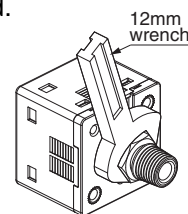
- When using a commercially available switching regulator on the power supply, be sure to ground the power supply frame ground (F.G.) terminal.

⚠ CAUTION

- Avoid use in high steam and dirt environments.
- Care must be taken to avoid product contact with organic solvents such as thinner, water, oil and fat.
- Do not put nails, etc., in the pressure port. The diaphragm could be damaged and normal operations disabled.
- Performance could not be guaranteed in strong electromagnetic field.
- Flash air pipe connected to sensors before connecting. Prevent pipe from catching tips of sealing tape when piping.

Piping

- When connecting a commercially available joint to the pressure port, attach a 12 mm wrench (14 mm for PPX-6G) to the hexagon section of the pressure port and install with a tightening torque of 9.8 N·m or less. A joint or the pressure port section could break if too much torque is applied. Use seal tape to connect joints to prevent air leak.

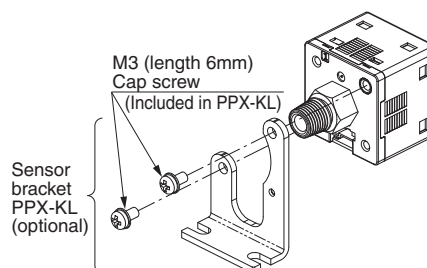


- The piping port is degreased and washed. Handle carefully when unpacking. (PPX-P12)

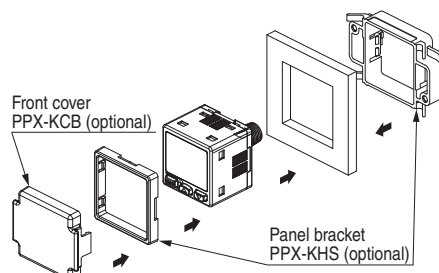
Installation

⚠ WARNING

- Sensor bracket PPX-KL is available. If a sensor is installed with a bracket, etc., tightening torque must be 0.5N·m or less.



- Panel mounting bracket PPX-KHS (optional) and front cover PPX-KCB (option) are also available.



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

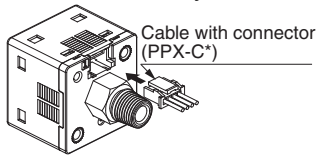
Electronic pressure switch
Pressure sensor

Installation & Adjustment

CAUTION

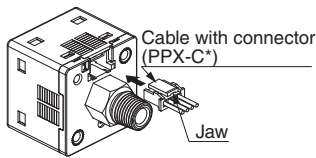
■ Care must be taken for protection of body and lead wire.

- Check that stress is not directly applied to cable lead outs or connectors.
- Do not bump or drop the main unit, or apply excessive bending or tensile strength to the lead because the lead could be disconnected.
- Connect and wire bending-resistant material, such as robot wire material, for the movable sections.



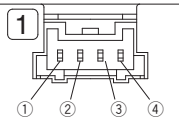
Connector wiring

- Connect by inserting the cable with connector PPX-C* into the product connection connector as shown at right.
- To remove, press down on the jaws of the cable with a connector and pull out the connector.
- Do not pull on the cable without pressing down on jaws. The cable could break or the connector could be damaged.



<Connector>
Contact : SPHD-001T-P0.5
Housing : PAP-04V-S
(JST MFG CO. LTD. Corp.)

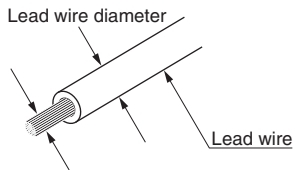
<Connector pin layout drawing>



Connector	Terminal name
①	+V
②	Comparison output 1
③	Standard type : Comparison output 2 High-function type : Analog voltage output or external input
④	0V

- When wiring with a connector set (PPX-CN), be sure to use a compatible cable and crimp tool for housing and contacts.

(Applicable cable)

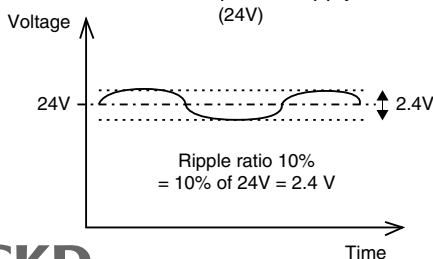


Conductor cross-section areas	0.12 to 0.32mm ² (AWG26 to 22)
Lead wire diameter	ø1.0 to ø1.5 mm
Material	Annealed copper twist wire

Housing	JST MFG CO. LTD. PAP-04V-S
Contact	JST MFG CO. LTD. SPHD-001T-P0.5
Recommended crimp tools	JST MFG CO. LTD. YC-610R (AWG 26 to 24) JST MFG CO. LTD. YC-611R (AWG 22)

Wiring

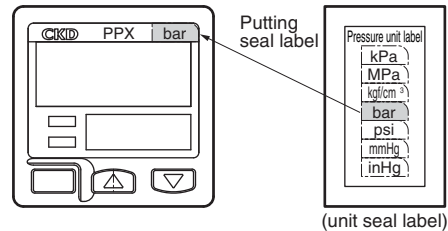
- Turn power OFF before wiring this product. Discharge static electricity charged in human body, tool or equipment before and during operation.
- Use stabilized noise-free power and having a ripple voltage of 10% or less for the power supply.



- Turn the power on and off at the quick rising and falling edges of voltage.
If the rated voltage is not reached, the sensor could malfunction. In some cases, the sensor could not recover after the rated voltage is reached. Reset the power in that case. Even if the voltage drops temporarily, shut down the power once, then turn ON the power again.
- Avoid using in a transient state continuing 0.5 s after power is turned on.
- Install the product and wiring as far as possible from noise source such as a strong electric line. Take separate measures against surge generated from inductive loads that enter the power supply.
- Do not operate the control unit, machinery or equipment immediately after wiring. Due to wrong setting, signals not expected could be outputted. First stop control unit, machinery and equipment, while energize these to test. Set the target setting after test.
- The cable can be extended up to 100 m when using a 0.3 mm² or larger cable. Note that the power line connected to this product must be less than 10m if used as a CE marked product.

When unit is changed

- When using the export type with the unit selection function and a unit other than MPa or kPa, be sure to attach unit labels enclosed with the product over the unit symbol indicated on the operation panel.



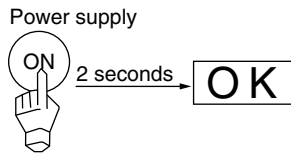
(unit seal label)

Electronic pressure switch and sensor PPD (-S), PPD-A, PPD3 (-S)

Design & Selection

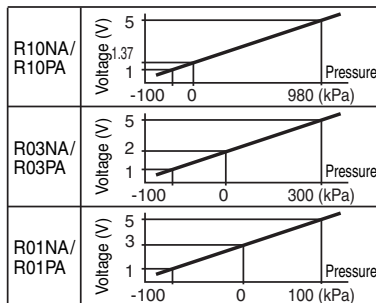
CAUTION

- This product self-diagnoses the internal circuit immediately after power is turned ON, so pressure is not detected immediately. Set the control circuit so signals are ignored for 2 seconds after power is turned ON.

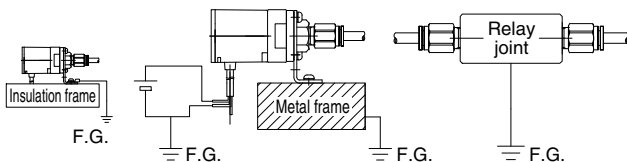


- This product's overcurrent protection turns the output OFF when an overcurrent is detected. However, output repeatedly turns ON a short time at a set cycle. This causes power voltage to fluctuate and may adversely affect peripheral devices.
- When using this product for compressed air containing water or oil, use the PPD (3)-S (stainless steel diaphragm sensor specifications) with increased corrosion resistance.

(Analog output type voltage waveform)



- Install the PPD (3)-S on a frame or panel connected to the frame ground F.G., and if necessary, directly connect from the PPD (3)-S port to the F.G. When leading fluids in from an external device, connect via a relay joint connected to the F.G. (To provide safety when using conductive fluids)



- The PPD (3)-S power supply is a DC stabilized power supply completely isolated from the AC primary side. Connect either the + side or - side of the power to the FG. A variable resistor (voltage limit 40 V) is connected between the internal power circuit and port installation section of this PPD (3)-S to prevent dielectric breakdown of the sensor. Do not conduct withstand voltage or insulation resistance tests between the PPD (3)-S's internal power supply circuit and port installation section. Disconnect the PPD (3)-S wiring if this type of test must be done. An excessive potential difference between the PPD (3)-S power supply and port installation section could burn internal parts.

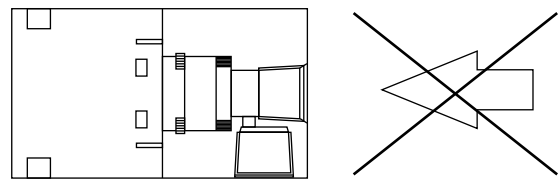
After installing, connecting, and wiring the PPD (3)-S, electrical welding of the device or frame, or short-circuit accidents, etc., could cause welding current, excessive high voltage caused by welding, or surge voltage, etc., to run through the wiring, ground wire, or fluid path connected between the above devices. This could damage wires or devices. Do work such as electrical welding after removing this device and disconnecting all electric wires connected to the F.G.

- Care must be taken to entry of water and drain.

The PPD (3)-S has a stainless steel diaphragm pressure sensor that cannot be damaged by water. However, when vacuum is broken after checking vacuum suction, drainage in the water and air could collide with the pressure sensor. The water's rush inertia could damage the pressure sensor and prevent the correct pressure from being indicated. If water or drainage could enter, connect a thin pipe to the PPD3, or install an orifice midway.

Take special care when using the back ports on the PPD3-S 6B port.

This has a 1 diameter orifice in the pressure port.



Take special care when using the back ports on the 6B if water of drainage could enter.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

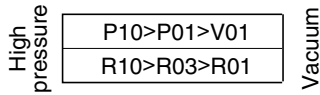
Electronic pressure switch
Pressure sensor

Installation & Adjustment

⚠ CAUTION

■ Check the pressure range.

If the pressure switch for low pressure range is incorrectly used for high pressure applications, this product could be ruptured or damaged, and a large amount of air could leak, creating a hazard.



■ When using this product, check that the two keys are accurately installed at the base case and body case contact. (These keys must not be removed) (PPD and PPD-S only)

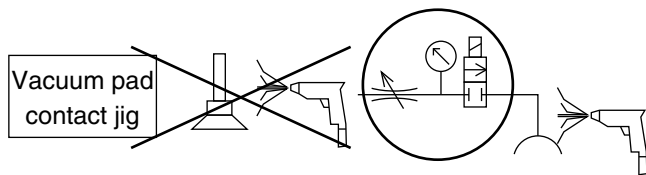
■ Switch data can be set to values that exceed the rating range, and to unrealistic values, and operation and accuracy at these values are not guaranteed. Confirm that settings enable the target operation. Ensure the following difference between data A and B to stabilize operation:

Operation mode	Difference of minimum digits
Hysteresis operation	1%F.S.
Window operation	3%F.S.

Do not set as follows Data A = Data B
ON point = OFF point

■ Avoid air blow

The high pressure near the nozzle could back flow and exceed the product withstand pressure. This could result in rupture or damage. Lower the pressure of compressed air to less than the withstand pressure, or shield the flow path when blowing air.



■ Remove humidity, dirt and contamination from the installation location. Select a flat installation surface. Any warp or bumps on the installation surface could damage the case or compromise protective functions. Excessive tightening of installation screws can result in similar damage.

- After installation, do not bump the case or use the case as step. Even if there is no external damage apparent, this remains as stress that gradually forms cracks and further damage.

■ Precautions for PPD-A or PPD3 (sensor integrated type) Series

- This product's protective functions are not effective when it is unpacked or during installation. The protective functions are effective when the product is correctly installed, wired, and piped. Provide protection so water and other substances do not come in contact until installation is completed.

- Wire and pipe the product after fixing it at the installation site. Check surrounding safety and that water and other substances do not come in contact before starting wiring. Continue to provide protection after the product is connected. (The current could leak at the connection section, and water could run along the cable and enter the case.)
- The atmospheric release port for atmospheric pressure is treated as a key point in ensuring this product's protective performance. Use the following tube, and release the end into the atmosphere at a dry environment with no barometric pressure difference.

Recommended tube:

Soft nylon tube Model no. FH-3224

Urethane tube Model no. U-9532, U-9504

<IMPORTANT>

Never apply pressure to atmospheric release port.

- If the inlet port for atmospheric release port pressure is pressurized, protective performance could be lost, and the case could rupture or pop off. Leave this port set at atmospheric pressure. Separate piping for atmospheric release port from other pressurized air piping by using different tube diameters or colors. Take sufficient means to prevent pressurized air from being applied.

- Even when protective performance is not required, if this product is installed in a humid environment with large temperature variation, dew condensation in the case is prevented by taking these measures. (Dew is fatal to the electric circuit.)
- Note that if this product in a control panel, pressurized to a positive pressure or negative pressure within a dry environment, the pressure difference could affect display accuracy.
- This product is intended to protect city water. Protection performance cannot be guaranteed for hot water, oil, coolant (nonwater soluble, water soluble), solvent, acid, alkaline, or chemicals, etc. These substances could cause solvent cracks to form on in the case's resin parts, the gasket to swell, the adhesive to melt and separate, and other problems. Note that if water that gets on the product freezes, the case could be damaged and protective performance lost.

- The sensor-separated display and sensor are adjusted as a set. The pressure value could deviate more than accuracy if parts from different lot numbers are used together.

- The connection on the PPD3-R*D sensor and joint can rotate, but operation could be obstructed if the section is repeatedly rotated during use.

- The protective structure is equivalent to IP65, but this product must not be used in an environment where it could come in contact with water. Check that cutting oil and coolant do not come in contact.

During Use & Maintenance

⚠ CAUTION

■ This product has O ring seals and threaded joints. A slight amount of air leaks (1cm³/min. ANR or less) is tolerated.

When using working fluid other than air; nitrogen gas, etc., oxygen deficiency could be caused. Observe the following instructions.

- Use this product in well ventilated locations.
- Ventilate the work area when nitrogen gas is being used.
- Inspect piping regularly, so nitrogen gas piping does not leak.

■ Fluids that could corrode the wet area material (*1) or flammable, explosive, or toxic fluids could damage the sensor or main body.

■ Check that fluid being measured does not freeze resulting in expansion or contraction of volume, that these elements do not solidify and stick due to drying, that solid elements do not accumulate, that accumulated fluid does not be decomposed, and that the product is not clogged by dirt. When using inductive fluids, if fluid stays in the middle of piping at low pressure ranges, pressure generated, preventing proper measurement. Fluids such as water or oil drainage could result in a water hammer caused by the fluid's inertial pressure, or a sudden pressure rise such as a surge pressure when the valve is turned ON and OFF, etc. Before installing, use a highly responsive pressure sensor and check that these do not exceed the guaranteed withstand pressure even instantly. Pressure exceeding the guaranteed withstand pressure could damage the sensor or body.

■ For safety, be sure to turn power off before connecting the sensor-separated sensor.

*1 Wet area materials

Model	Material
PPD	PP resin, NBR, FKM, aluminum, silicon, crystal polymer
PPD3	PBT resin, NBR, FKM, silicon, PPS
PPD-A	PP resin, NBR, FKM, aluminum
PPD-S	SUS630, FKM, aluminum, PBT resin
PPD3-S	SUS630, FKM, aluminum

Note: The joint material is included for models with push-in joints (PPD-A, PPD-*-HS, PPD3-*-6HD, PPD3-*-6HT).

Joint	NBR, brass (nickeling)
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Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
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Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch
Pressure sensor

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
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F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch PPS2 Series

Design & Selection

⚠ CAUTION

- The cable can be extended by adding connectors to a maximum length within 20m.

- Pipe and connect the atmospheric pressure introduction port (M3 x 0.5) of the sensor-separated type. The sensor's protective structure (IP67) is not satisfied.

Installation & Adjustment

⚠ CAUTION

- The sensor separate type body and sensor are adjusted as a set. Do not use parts with different lot numbers.

- Do not tighten terminal screws with excessive torque. (Tightening torque: 0.5 to 0.7 N·m)

■ Switch type

- Analog output load impedance must be 1kΩ and over.
- The zero point of the absolute pressure type cannot be adjusted.

■ Controller type

- Use a proportional pressure device with a 0 to 10 V signal input voltage.
- Do not connect a load other than the proportional pressure device to the proportional pressure device command output terminal.
- Do not issue a voltage signal to pressure selection input. Use a relay contact or an NPN transistor open collector. Input these by short-circuiting the "GND" terminal and "IN1 to 4" terminals. Issue the input signal for 50msec. and over. Input to several selection signals is not accepted.

Electronic differential pressure switch DP1000 Series

Design & Selection

⚠ CAUTION

- Do not install in places where corrosive gases are generated, or where chemicals, water, or oil could come in contact.
- Avoid installing where impact or vibration of 98m/s² and over may be applied.

- Separate the sensor and monitor sections from the power distribution cable.

Installation & Adjustment

⚠ CAUTION

Sensor section installation

- The body and the sensor are adjusted by a set. Do not use parts with different lot numbers.
- Do not tighten terminal screws with excessive torque. (Tightening torque: 0.5 to 0.7 N·m)
- The pressure port is Rc1/8. When installing the nipple, use sealing material (sealing tape, gel type sealant) so air does not leak. Check that sealing material does not get inside. Catch a wrench on the pressure port and screw in the sensor section.
- Pipe so that water and other fluids do not directly enter the sensor section.
- When using the dedicated bracket, take care not to tighten screws too far. Excessive load could be applied to the sensor section.
- Do not disassemble or dismantle the product. If disassembled, parts could pop off when pressure is applied. CKD does not guarantee performance after disassembly.

Operation

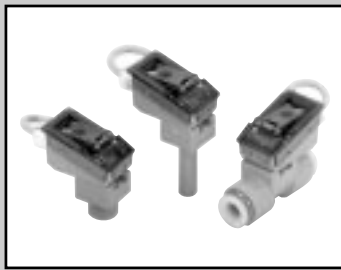
- Supply voltage of 11 to 26 VDC to the power terminal. Use a power supply with little voltage fluctuation (ripple rate 1% or less). The power current is 100mA.
- Use this product within the working pressure range.
- If the displayed pressure is not zero when no pressure is applied, press the 0-ADJ key and adjust the zero point.
- Press the READ key to check the switch output set value.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

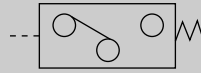
Electronic pressure switch
Pressure sensor

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending



Compact electronic pressure switch

PPE Series



Refer to Intro 32 for details.



Overview

Pressure switch PPE Series is trimmer setting type semiconductor pressure switch developed for pneumatic/vacuum systems. Usage is flexible due to small shape and three types of connecting port (R1/8, ø6 plug, ø6 push-in joint)

Features

- Semiconductor pressure sensor
Used semiconductor sensor pressure detection, high precision and high reliability are achieved.
- 2 wire
Due to 2 wire type, wiring man-hour is reduced, and both PLC input formats (source and sink) can be used.
- High withstanding pressure
Withstanding pressure of negative pressure type (V01) is as high as 0.6MPa, so the product can withstand to vacuum break by pressurization.
- Reverse connection / over current protection circuit integrated
A protective circuit for improper wire connection (reverse connection, load short circuit) is integrated.
- Wide port size
R1/8
ø6 plug
ø6 push-in joint

Specifications

Model no.	Vacuum		Positive pressure	
	Note 1 PPE-V01-□		Note 1 PPE-P01-□	
Descriptions	PPE-V01-□		PPE-P01-□	PPE-P10-□
Pressure range	-101.3 to 0kPa		0 to 100kPa	0 to 1MPa
Name plate color Note 2	Red		Green	Blue
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor			
Working fluid	Air/non-corrosive gas			
Withstanding pressure	0.6MPa		0.3MPa	1.5MPa
Repeatability	±1%F.S.			
Hysteresis	3%F.S. or less			
Temperature characteristics	±3%F.S.			
Load voltage	10 to 30 VDC			
Load current	5 to 50mA			
Internal voltage drop	4V or less			
Leakage current	1mA or less			
Light display	Yellow LED lights when power turns ON			
Lead wire length	Standard 3m (oil resistant vinyl cable 2-conductor 0.15mm ² isolator outer diameter ø1.0)			
Ambient temperature range	0 to 50°C (no freezing)			
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm 4 hours per X, Y, Z direction			
Protective structure	IEC standards IP65 or equivalent			
Piping method	R1/8, ø6plug, ø6push-in joint			

Note 1: □ section is matched to piping section. (Refer to How to order)

Note 2: Name plate color is changed per pressure range. (To prevent improper use)

Clean room specifications (catalog No. CB-033SA)

- Dust generation preventing structure for use in cleanrooms

PPE..... P70

PPE..... P80

How to order

PPE - **V01** - **6**

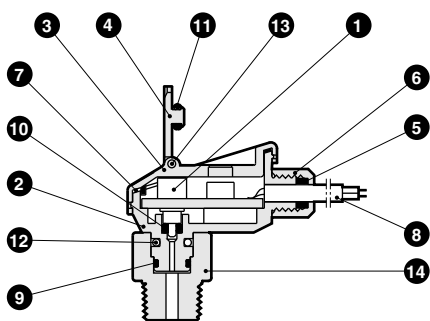
A Pressure range

B Piping shape

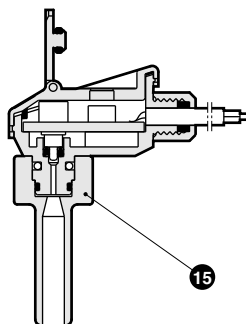
Symbol	Descriptions
A Pressure range	
V01	-101.3 to 0kPa
P01	0 to 101kPa
P10	0 to 1MPa
B Piping shape	
6	R1/8
H6-B	ø6mm plug
H6	Inline type for ø6 push-in joint (2 pcs.)

Internal structure and parts list

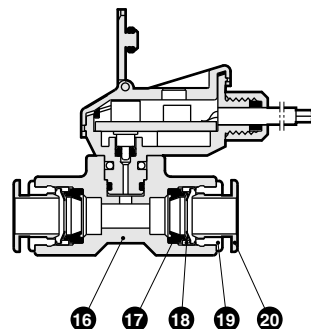
● PPE-*-6



● PPE-*-H6-B



● PPE-*-H6

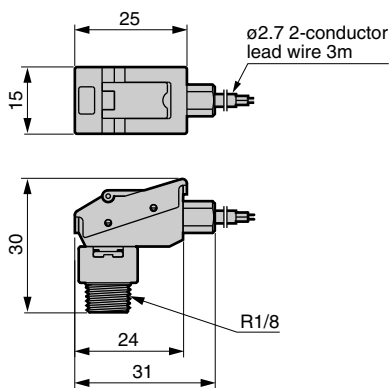


No.	Parts name	Material	No.	Parts name	Material
1	Pressure sensor	Carrier diffusion type semiconductor strain gauge	11	O ring	Nitrile rubber
2	Body	PBT (glass fiber 30%)	12	Stopper	Stainless steel
3	Guard	Polycarbonate	13	Spring pin	Stainless steel
4	Trimmer guard	Polycarbonate	14	R1/8	PBT (glass fiber 30%)
5	Bush	Nitrile rubber	15	Plug	PBT (glass fiber 30%)
6	Bush holder	Aluminum	16	Push-in joint	PBT
7	Guard gasket	Silicon rubber	17	Packing seal	Nitrile rubber
8	Lead wire (3m)	Polyvinyl chloride	18	Chuck	Brass (electroless nickeling)
9	O ring	Nitrile rubber	19	Outer ring	Brass (electroless nickeling)
10	O ring	Nitrile rubber	20	Push ring	Polyacetal

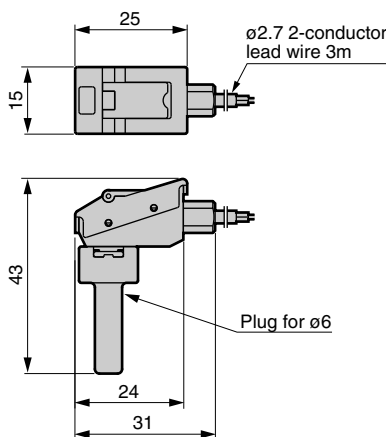
Dimensions



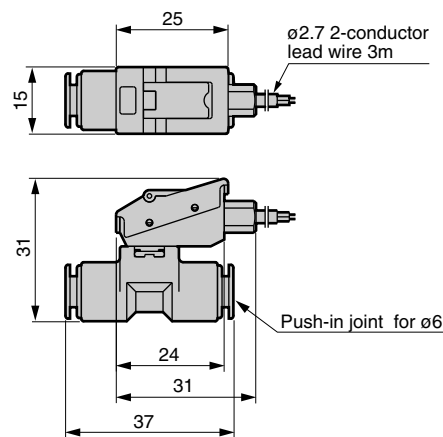
● PPE-*-6



● PPE-*-H6-B



● PPE-*-H6



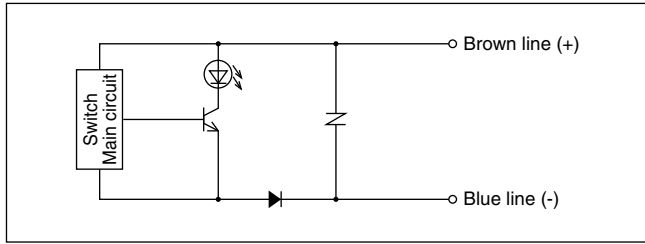
Refer to Precaution PPE Series on pages 1078 to 1079 for each component.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

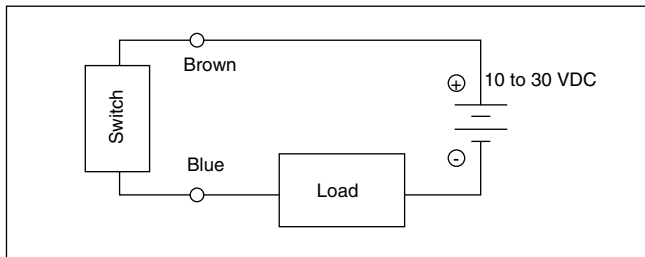
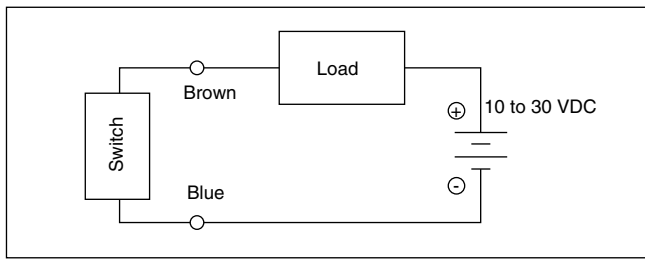
Electronic pressure switch
Pressure sensor

Internal circuit / connection method

● Internal circuit diagram

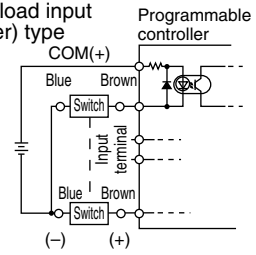


● Connection of lead wire

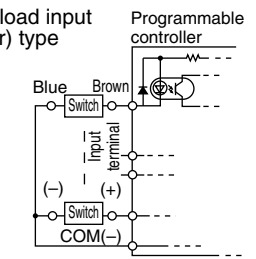


● Connection to programmable controller (PLC)

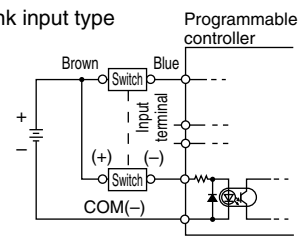
● Connection to source load input (external electric power) type



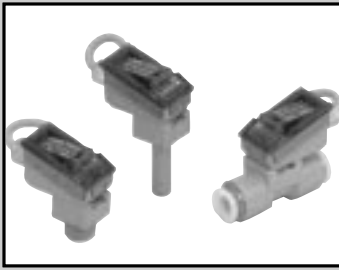
● Connection to source load input (internal electric power) type



● Connection to sink input type

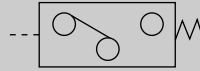


Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending



Compact electronic pressure sensor
Analog output type

PPE-*A Series



Refer to Intro 32 for details.



Overview

Pressure sensor PPE-A Series is semiconductor pressure sensor developed for pneumatic and vacuum systems. Output promotional to impressed voltage: 1 to 5V (analog output). Usage is flexible due to small shape and three types of connecting port (R1/8, ø6 plug, ø6 push-in joint)

Features

- Semiconductor pressure sensor: Used semiconductor sensor pressure detection, high precision and high reliability are realized.
- Analog output: Analog output proportional to impressed voltage (1 to 5V).
- Power supply indicator light: When power is energized, green LED lights to show operational state at load short circuit.
- Integrating protective circuit to prevent power supply reverse connection / load short circuit
A protective circuit for improper wire connection (power supply reverse connection, load short circuit) is integrated.
- Wide port size: R 1/8, ø6 plug, ø6 push-in joint.

Specifications

Model no.	Vacuum		Positive pressure	
	PPE-V01A-□ Note 1	PPE-P01A-□ Note 1	PPE-P10A-□ Note 1	
Descriptions				
Pressure range	0 to -100kPa	0 to 100kPa	0 to 1MPa	
Name plate line color Note 2	Red	Green	Blue	
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor			
Working fluid	Air/non-corrosive gas			
Withstanding pressure	0.3MPa	0.3MPa	1.5MPa	
Precision	±1%F.S. or less			
Linearity	±0.3%F.S. or less			
Analog output	1 to 5 V (output impedance 1KΩ)			
Power voltage	12 to 24 VDC±10% (ripple ratio 1% or less)			
Current consumption	10mA or less			
Light display	Green LED lights, when power supply turns ON			
Lead wire length	Standard 3m (oil resistant vinyl cabtire cable, 3-conductor, 0.15mm ² isolator outer diameter ø1.0)			
Protective circuit	Power supply reverse connection protection load phase fault protection			
Ambient temperature	0 to 50°C (no freezing)			
Temperature characteristics	±0.12%F.S./°C or less			
Insulation resistance	20MΩ and over with 500 VDC			
Withstanding voltage	1000 VAC for one minute			
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm, 4 hours per X, Y, Z direction			
Protective structure	IEC standards IP65 or equivalent			
Piping method	R1/8, ø6 plug, ø6 push-in joint			

Note 1: □ section is matched to piping section. (Refer to How to order)

Note 2: Name plate color is changed per pressure range. (To prevent improper use)

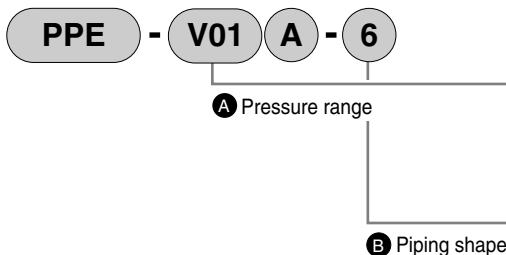
Clean room specifications (catalog No. CB-033A)

- Dust generation preventing structure for use in cleanrooms

PPE-*A P70

PPE-*A P80

How to order

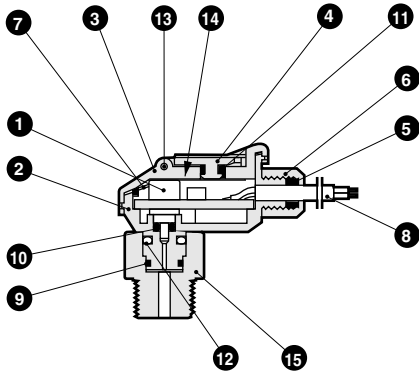


Symbol	Descriptions
A Pressure range	
V01	0 to -100kPa
P01	0 to 100kPa
P10	0 to 1MPa
B Piping shape	
6	R1/8
H6-B	ø6mm plug
H6	Inline type for ø6 push-in joint (2 pcs.)

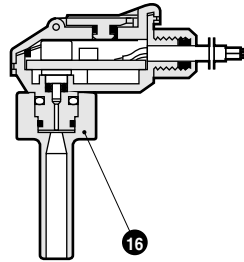
- Refrigerating type dryer
- Desiccant type dryer
- High polymer membrane type dryer
- Air filter
- Auto. drain / others
- F.R.L. (Module unit)
- F.R.L. (Separate)
- Compact F.R.
- Precise regulator
- F.R.L. (Related products)
- Clean F.R.
- Electro pneumatic regulator
- Air booster
- Speed control valve
- Silencer
- Check valve / others
- Joint / tube
- Vacuum filter
- Vacuum regulator
- Suction plate
- Magnetic spring buffer
- Mechanical pressure SW
- Electronic pressure SW
- Contact / close contact cont. SW
- Air sensor
- Pressure SW for coolant
- Small flow sensor
- Small flow controller
- Flow sensor for air
- Flow sensor for water
- Total air system
- Total air system (Gamma)

Internal structure and parts list

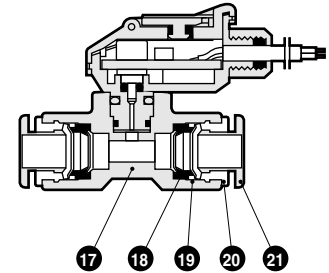
● PPE-*A-6



● PPE-*A-H6-B



● PPE-*A-H6

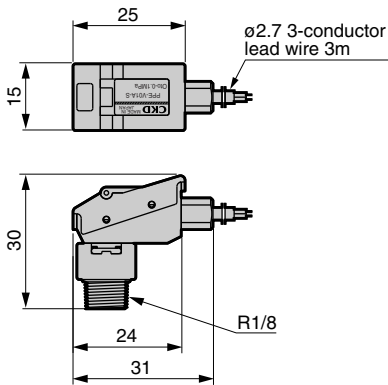


No.	Parts name	Material	No.	Parts name	Material
1	Pressure sensor	Carrier diffusion type semiconductor strain gauge	12	Stopper	Stainless steel
2	Body	PBT (glass fiber 30%)	13	Spring pin	Stainless steel
3	Guard	Polycarbonate	14	Shield seat	Aluminum
4	Trimmer guard	Polycarbonate	15	R1/8	PBT (glass fiber 30%)
5	Bush	Nitrile rubber	16	Plug	PBT (glass fiber 30%)
6	Bush holder	Aluminum	17	Push-in joint	PBT
7	Guard gasket	Silicon rubber	18	Packing seal	Nitrile rubber
8	Lead wire (3m)	Polyvinyl chloride	19	Chuck	Brass (electroless nickeling)
9	O ring	Nitrile rubber	20	Outer ring	Brass (electroless nickeling)
10	O ring	Nitrile rubber	21	Push ring	Polyacetal
11	O ring	Nitrile rubber			

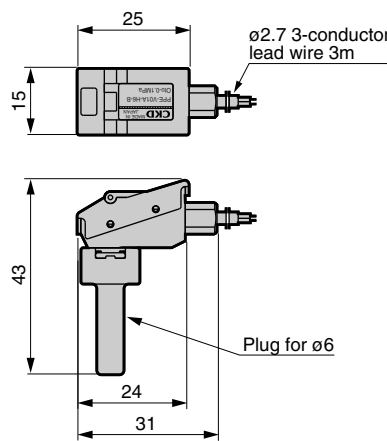
Dimensions



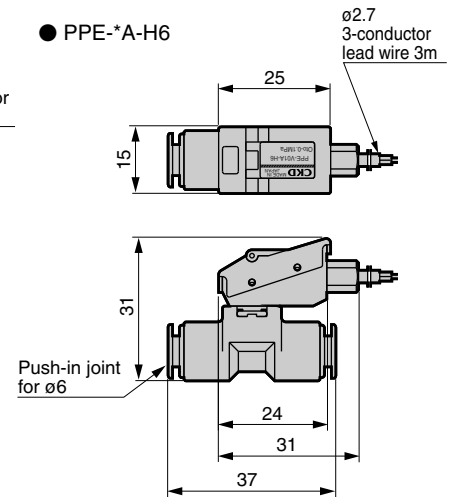
● PPE-*A-6



● PPE-*A-H6-B



● PPE-*A-H6

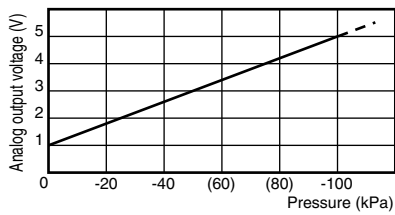


⚠ Cautions

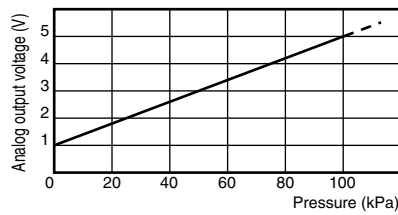
- Analog output accuracy is also affected by self exoergic at energized other than temperature characteristics. Provide enough stand-by time (5minutes and over after energizing) before starting operation.
- Refer to precautions in PPE-*A Series on pages 1080 to 1081.

Analog output voltage - pressure characteristics

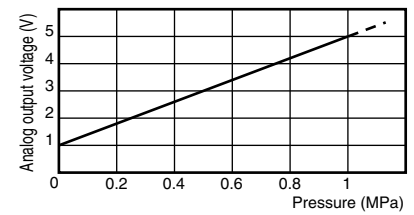
● PPE-V01A-*



● PPE-P01A-*



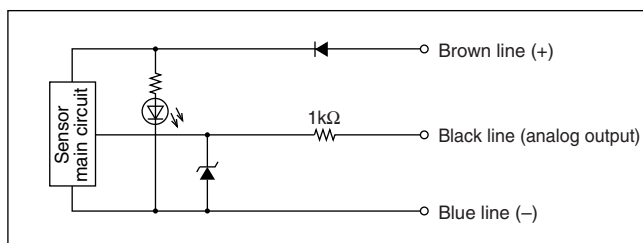
● PPE-P10A-*



Internal circuit / connection method

<Circuit diagram and connection method>

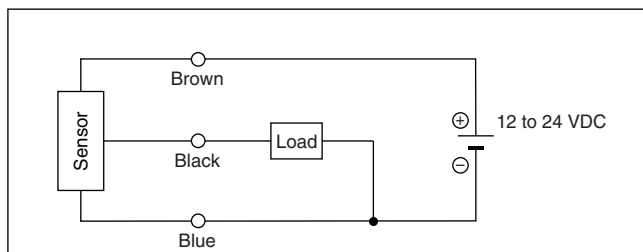
● Internal circuit diagram



● Connection of lead wire

Line color	Descriptions
Brown	Power supply 12 to 24 VDC
Black	Analog output (1 to 5V)
Blue	0V (GND)

● Connection of lead wire



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure switch
Pressure sensor

Electronic pressure switch

PSW Series

High precision pressure switch with semiconductor pressure sensor.



Overview

This product is reliable pressure switch developed for pneumatics/vacuum systems. Due to a semiconductor pressure sensor, high precision and high speed response are achieved.

Features

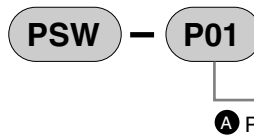
- Fast responsiveness (10ms)
- Due to no movable part, high reliability and long service life are achieved.
- Using multi rotation trimmer and operational indicator light, setting is easily done.
- Precision $\pm 3\%$ F.S.

Specifications

Descriptions	PSW-P01	PSW-P10	PSW-V01
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor		
Working fluid	Air/non-corrosive gas		
Pressure range	0 to 100kPa	0 to 1MPa	0 to -100kPa
Withstanding pressure	F.S. x 1.5 times		
Operation precision	$\pm 3\%$ F.S. (0 to 50°C)		
Light display	Red LED lights when turned ON		
Hysteresis	2%F.S. or less		
Working temperature	0 to 50°C		
Storage temperature	-20 to 80°C (no freezing)		
Response time	10ms or less		
Switch rated	NPN transistor open collector MAX30V 80mA		
Analog output Note	1 to 5 VDC (0 to F.S.) $\pm 3\%$ F.S. (25°C)		
Power voltage	11 to 26 VDC 30mA (ripple ratio 1% or less)		
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm 2 hours per X, Y, Z direction		
Lead wire length	1.5m shield wire		
Weight	0.06 kg		

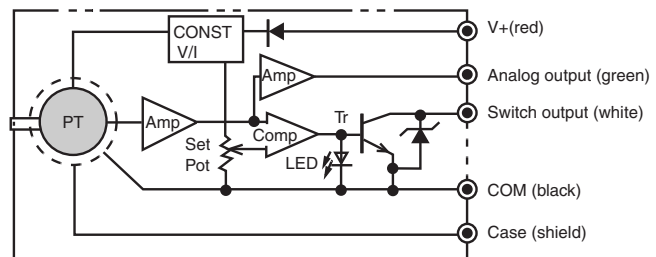
Note : Voltage of analog output may vary within 1 ± 0.4 VDC to 5 ± 0.8 VDC per product.

How to order



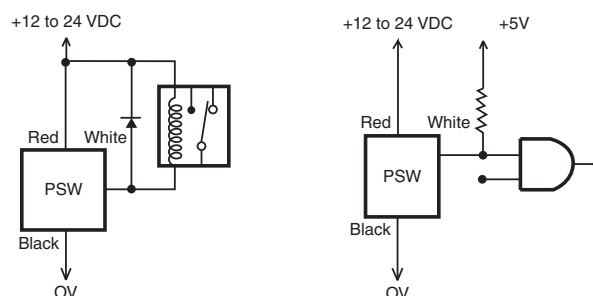
Symbol	Descriptions
A	Pressure range
P01	0 to 100kPa
P10	0 to 1MPa
V01	0 to -100kPa

Configuration fig.

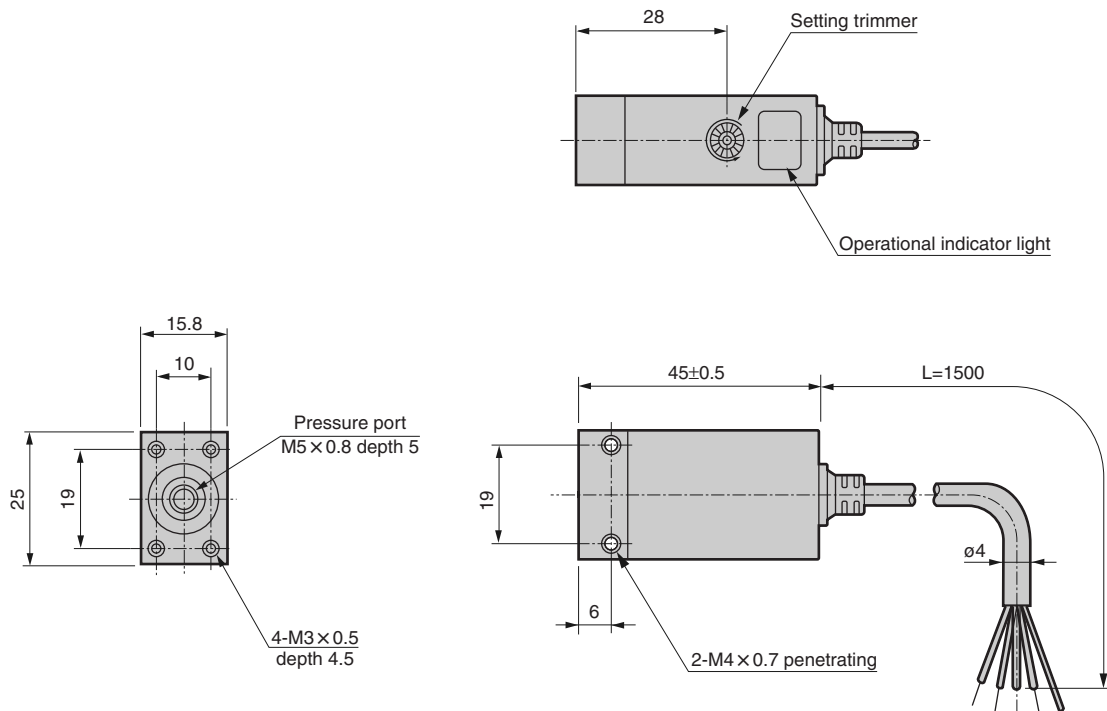


- Red LED lights when turning ON.
- Care must be taken for handling for lead wire.

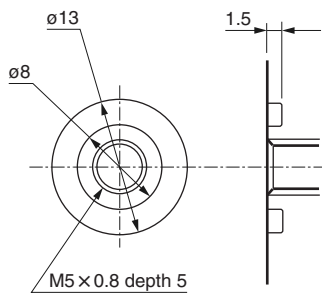
Example of wiring



Dimensions

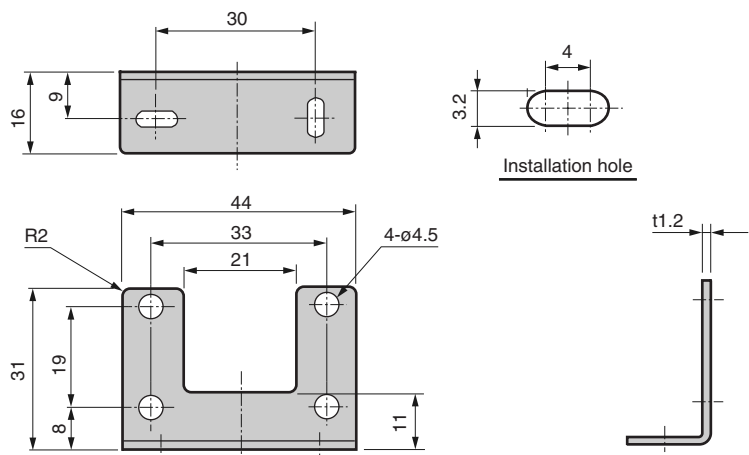


● Pressure port section details (Note)



(Note) Conformity O ring (JIS B2401)
 Positive pressure : P10
 Negative pressure : P8

● Bracket (accessory)



⚠ Refer to Safety precautions PSW Series on page 1082 for details.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch
 Pressure sensor



Digital twin display improves

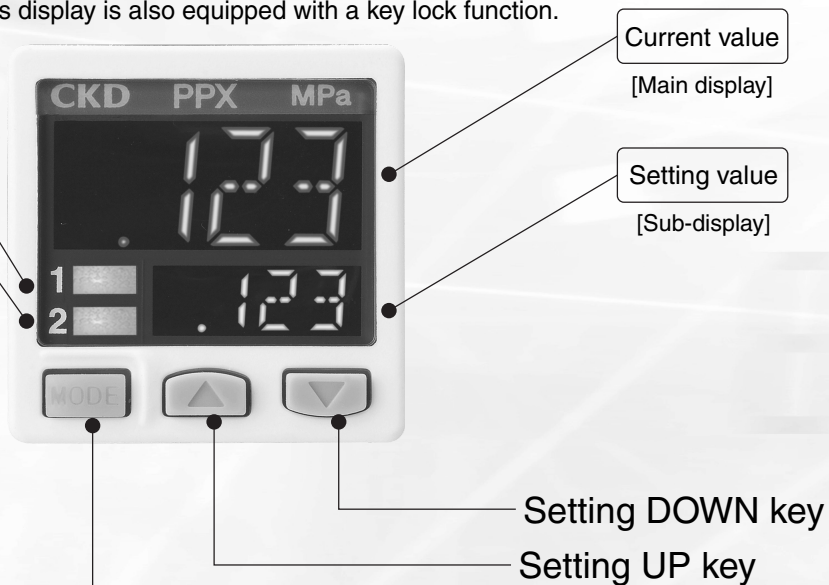
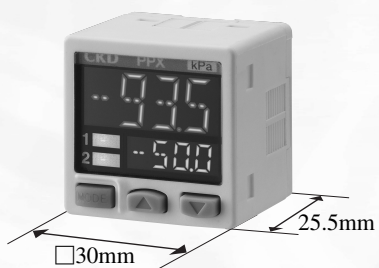
The digital pressure sensor PPX Series is equipped with unprecedented ease-of-use and high functionality including a twin display allowing the pressure's [Current value] and [Set value] to be confirmed simultaneously, a tri-color display, setting details copy function, and three mode settings.

Direct settings with twin display

A main screen showing the [Current value] and a sub-screen showing the [Setting value] are arranged in a compact size. The setting value can be adjusted and set while displaying the [Current value]. ON and OFF can be used while making settings, providing the same feel as a potentiometer type sensor. This display is also equipped with a key lock function.

Comparison output 1 operation indicator light
Comparison output 2 operation indicator light
(High-function type is analog Voltage output operation indicator)

Compact
*30 x 25.5 size



Three mode settings to match usage method

The modes have been clearly divided according to the level of setting details. The "RUN mode" is used for daily operation settings, the "menu mode" for basic settings, and the "PRO mode" for high-level functions. The operation settings are easy to understand and simple to use.

RUN mode
Operations enabled during operation, such as setting value adjustment and key lock can be carried out.

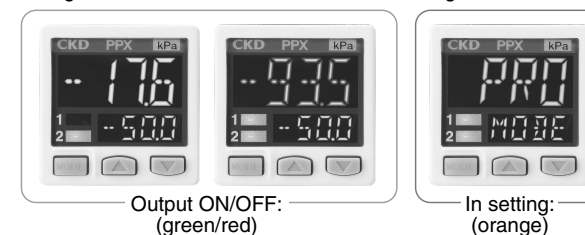
Menu setting mode
Basic settings, such as setting of the output mode, and selection of NO and NC are possible.

PRO mode
Advanced function settings such as copy functions and changes to the sub-display area are possible.

visibility!

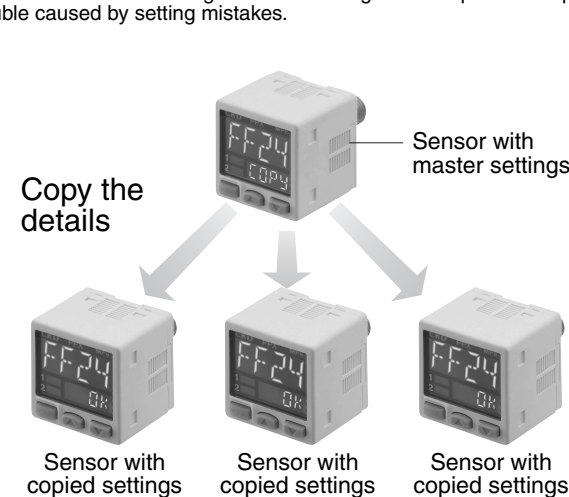
Tri-color display (red / green / orange)

The main display area changes between green and red in sequence with the output's ON and OFF state. The display is orange while making settings. The sensor's state can be viewed in a glance.



Copy function for reducing man-hours and preventing mistakes

The sensor's setting details can be quickly copied to another sensor with data communication. Using the same settings for multiple sensor prevents trouble caused by setting mistakes.



Customized sub-display area

In addition to the setting values, random alphanumeric characters can be displayed on the sub-display area. This function eliminates the need to attach labels to show the correct pressure value or unit No., etc.



Export dedicated models available

These models are equipped with a unit changeover function. Pa, kPa, kgf/cm², bar, psi, mmHg, inchHg

CE Mark compatible part

RoHS Directive compliant



Two independent outputs (standard type)

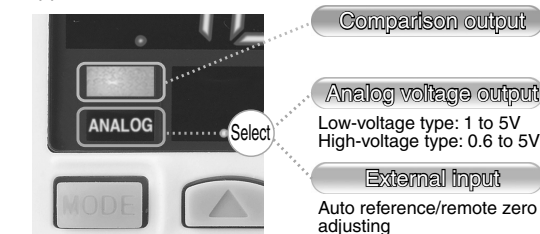
Different detection modes can be set for each of the two independent comparative outputs.

[Three selectable detection modes]

- EASY mode**
ON/OFF control of comparative output.
- Hysteresis mode**
ON/OFF control using set comparative output hysteresis.
- Window comparator mode**
ON/OFF control of comparative output within set range's pressure.

High-function type for various applications

With the high function type, an analog voltage output or external input can be selected instead of one of the comparative outputs. This type can be used for a variety of applications.



Convenient functions

- Easy-to-read alphanumeric display**
Alphanumeric displays using twelve segments are incorporated, making it easier to read alphanumeric characters.



- Peak bottom hold function**
The fluctuating pressure's maximum and minimum pressures are displayed on two screens.
- Vary response time in ten stages.**
(2.5ms to 5000ms)
- Display setting details with code numbers.**

Standard energy-saving mode

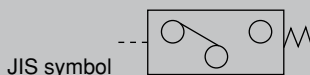
Power consumption can be reduced by approx. 30% to 40%.
(By reducing display area brightness, or turning display OFF.)

Space saving
Sensors can be installed in close contact.



Digital pressure sensor

PPX Series



Specifications

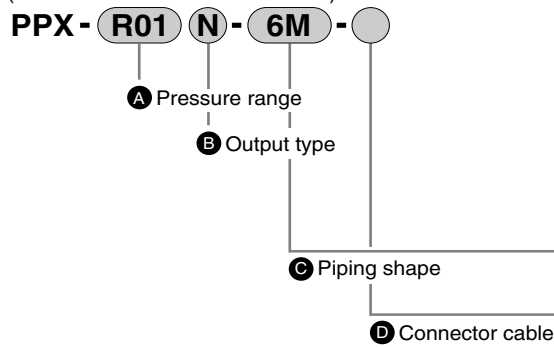
Descriptions	Standard type		High-function type	
	Low pressure PPX-R01*	High pressure PPX-R10*	Low pressure PPX-R01*H	High pressure PPX-R10*H
Pressure sensitive element	Diffused semiconductor pressure sensor			
Working fluid	Air/non-corrosive gas			
Type of pressure	Gauge pressure			
Rated pressure range	-100.0 to +100.0kPa	-0.100 to +1.000MPa	-100.0 to +100.0kPa	-0.100 to +1.000MPa
Set pressure range	-100.0 to +100.0kPa	-0.100 to +1.000MPa	-100.0 to +100.0kPa	-0.100 to +1.000MPa
Display unit	kPa	MPa	kPa	MPa
Minimum display unit	0.1kPa	0.001MPa	0.1kPa	0.001MPa
Unit change	Compatible only with export models (-KA) (MPa, kPa, kgf/cm ² , bar, psi, mmHg, inchHg)			
Withstanding pressure	500kPa	1.5MPa	500kPa	1.5MPa
Repeatability	±0.1%F.S. (within ±2 digits)	±0.2%F.S. (within ±2 digits)	±0.1%F.S. (within ±2 digits)	±0.2%F.S. (within ±2 digits)
Temperature characteristics (+20°C reference)	Within ±0.5%F.S.	Within 1%F.S.	Within ±0.5%F.S.	Within 1%F.S.
Indicator	4-digit + 4-digit tri-color LCD display (display update cycle: 250 ms, 1000 ms, select with key operations)			
Indicator light	Orange LED (Comparison output 1 operational indicator light, comparison output 2 operational indicator light: comparison output ON lighting)		Orange LED (Comparison output 1 operational indicator light: comparison output ON lighting, analog voltage output operational indicator light: Lighting when setting)	
Power voltage	12 to 24 VDC±10% ripple P-P10% or less			
Power consumption	Normal: 840mW or less (current consumption 35mA or less at 24 V power) ECO mode: 600mW or less at STD (current consumption 25mA or less at power voltage 24V), 480mW or less at FULL (current consumption 20mA or less at power voltage 24V)			
Comparison output (switch output)	(NPN output type) NPN transistor/open collector • Max. inrush current: 100mA • Applied voltage: 30 VDC or less (comparison output -0V interval) • Residual voltage: 2V or less (at inrush current 100mA)		(PNP output type) PNP transistor/open collector • Max. output current: 100mA • Applied voltage: 30 VDC or less (comparison output between - and +) • Residual voltage: 2V or less (at output current 100mA)	
	Output operation Select NO/NC with the key operation			
	Output mode EASY MODE/hysteresis mode/window comparator mode			
	Hysteresis Min.1 digit (variable)			
	Response time 2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1000ms, 5000ms select by the key operation			
	Short circuit protection Equipped			
External input (auto reference/ remote zero adjusting)	_____		(NPN output type) ONVoltage: 0.4VDC or less OFF voltage: 5 to 30 VDC or release Input impedance: 10kΩ Input time: 1ms and over	(PNP output type) ONVoltage: 5V to +VDC OFF voltage: 0.6 VDC or less or release Input impedance: 10kΩ Input time: 1ms and over
	_____		Output voltage: 1 to 5V Zero point: Within 3V 5%F.S. Span: Within 4V±5%F.S. Linearity: Within 1%F.S. Output impedance: 1kΩ	Output voltage: 0.6 to 5V Zero point: Within 1 V±5%F.S. Span: Within 4.4V±5%F.S. Linearity: Within 1%F.S. Output impedance: 1kΩ
Environment conditions	Protective structure IP40 (IEC)			
	Ambient temperature -10 to + 50 , at store: -10 to + 60°C			
	Ambient humidity 35 to 85%RH (no dew condensation, freezing), store: 35 to 85%RH			
	Withstanding voltage 1000 VAC for one minute applied to all charged sections/between cases			
	Insulation resistance 50MΩ and over with 500 VDC mega applied to all charged sections/between cases			
	Mechanical vibration proof Durability 10 to 500 Hz double amplitude 3 mm 2 hours each in XYZ directions (When mounted on panel: durability 10 to 150 Hz double amplitude width 0.75 mm 2 hours each in XYZ directions)			
Mechanical shock proof Durability 100 m/S ² (10 G) 3 times each in XYZ directions				
Connection		Connector		
Port size	Note 1	M5 female thread + R (PT) 1/8 male thread		
Wiring length		When wire is extended, up to 100 m permissible with 0.3 mm ² or larger cable (less than 10 m when CE Mark-compliant)		
Weight		Product weight: approx. 40g, weight including package: 135g		
Accessory	Note 2	PPX-C2 (2m cable with connector): 1 pc. Unit seal label (KA with unit change): MPa, kPa,kgf/cm ² , bar, psi, mmHg, inchHg		

Note 1: See Table 1 on the next page for export use.

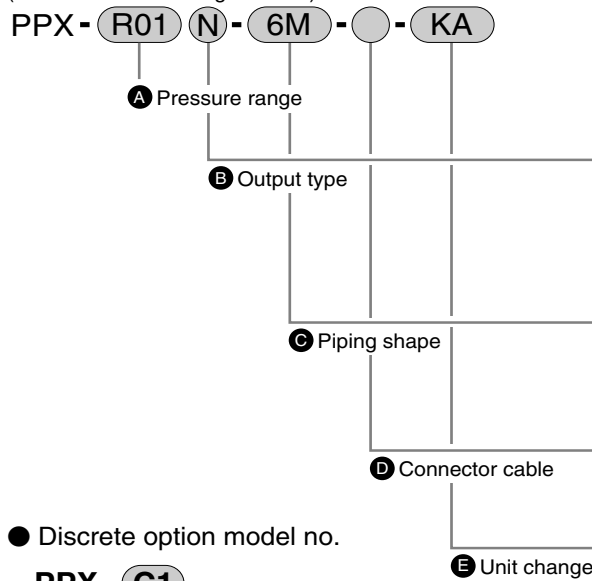
Note 2: For (- J), connector cable is not attached.

How to order

(How to order for domestic market)



(How to order for foreign market)



● Discrete option model no.

PPX - **C1**

Symbol	Descriptions
C1	Cable with connector 1m
C2	Cable with connector 2m
C3	Cable with connector 3m
C5	Cable with connector 5m
CN	Connector set (10 pcs. per set)
KL	Bracket (set screw attached)
KHS	Panel bracket
KCB	Front protective cover (when using panel bracket)

Symbol	Descriptions
A Pressure range	
R01	-100.0 to 100.0kPa
R10	-0.100 to 1.000MPa
B Output type	
N	NPN transistor output 2 point (Standard type)
P	PNP transistor output 2 point (Standard type)
NH	NPN transistor output 1 point + analog voltage output or external input (high-function type)
PH	PNP transistor output 1 point + analog voltage output or external input (high-function type)
C Piping shape	
6M	R1/8, M5 female thread
D Connector cable	
Blank	2m connector cable attached
J Note 1	Without connector cable

Note 1: Only "N" or "NH" can be selected for item **B** Output.

In compliance with new Measurement Laws, export models with unit select function cannot be used in Japan.

Symbol	Descriptions
A Pressure range	
R01	-100.0 to 100.0kPa
R10	-0.100 to 1.000MPa
B Output type	
N	NPN transistor output 2 point (Standard type)
P	PNP transistor output 2 point (Standard type)
NH	NPN transistor output 1 point + analog voltage output or external input (high-function type)
PH	PNP transistor output 1 point + analog voltage output or external input (high-function type)
C Piping shape	
6M Note 1	R1/8, M5 female thread
6N	NPT1/8, M5 female thread
6G Note 2	G1/8, M5 female thread
D Connector cable	
Blank	2m connector cable attached
J Note 3	Without connector cable
E Unit change	
KA	With unit change function

Note 1: Only "N" or "NH" can be selected for item **B** Output

Note 2: Selectable only when "P" or "PH" is selected for item **B** Output type

Note 3: Selectable only when "N" or "P" is selected for item **B** Output type

Destination	Switch output		Unit	Unit change function	Unit seal label Attached Note 1	Piping port
	NPN	PNP				
Domestic	○	○	kPa/MPa	—	—	R1/8(M5)
Asia	○	—	kPa/MPa	○	○	R1/8(M5)
Europe	—	○	kPa/MPa	○	○	G1/8(M5)
North America	○	○	kPa/MPa	○	○	NPT1/8(M5)

Note 1: See page 1084 for the enclosed unit label.

(Table 1)

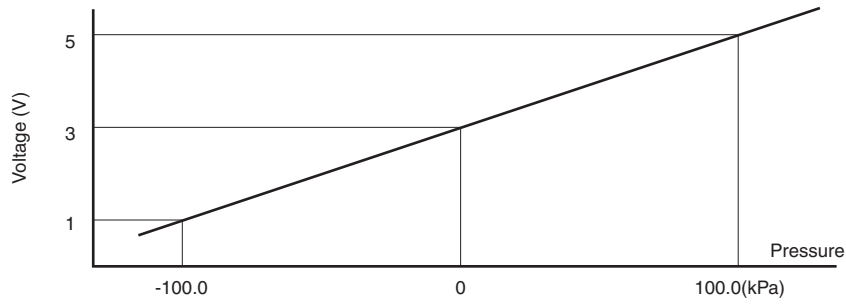
Type	Model no.	Port size	Output type	Remarks
Standard type	PPX-R01N-6M-(J)-KA	M5 female thread + R (PT) 1/8 male thread	NPN transistor/open collector	For Asia
	PPX-R10N-6M-(J)-KA			
High-function type	PPX-R01NH-6M-KA			
	PPX-R10NH-6M-KA			
Standard type	PPX-R01P-6G-(J)-KA	M5 female thread + G1/8 male thread	PNP transistor/open collector	For Europe
	PPX-R10P-6G-(J)-KA			
High-function type	PPX-R01PH-6G-KA			
	PPX-R10PH-6G-KA			
Standard type	PPX-R01N-6N-(J)-KA	M5 female thread+NPT1/8 male thread	NPN transistor/open collector	For North America
	PPX-R01P-6N-(J)-KA		PNP transistor/open collector	
	PPX-R10N-6N-(J)-KA		NPN transistor/open collector	
	PPX-R10P-6N-(J)-KA		PNP transistor/open collector	
High-function type	PPX-R01NH-6N-KA		NPN transistor/open collector	
	PPX-R01PH-6N-KA		PNP transistor/open collector	
	PPX-R10NH-6N-KA		NPN transistor/open collector	
	PPX-R10PH-6N-KA		PNP transistor/open collector	

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

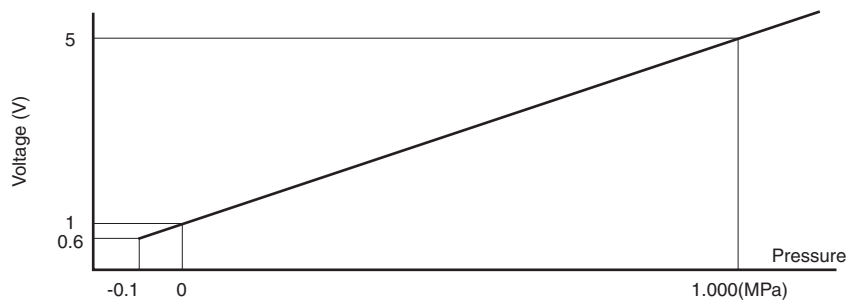
With digital display
Pressure sensor

Analog output voltage - pressure characteristics

● PPX-R01NH R01PH



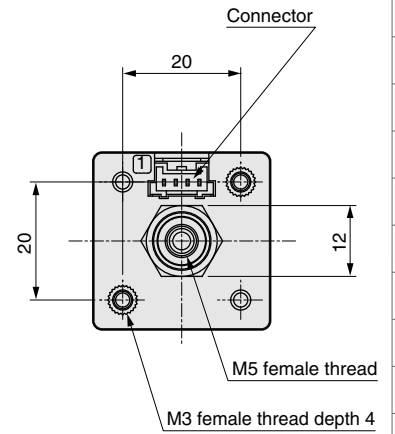
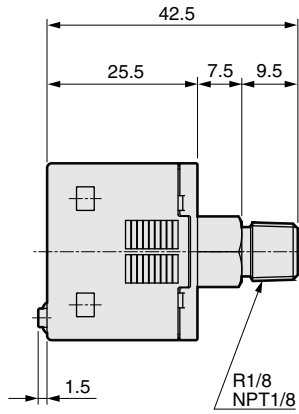
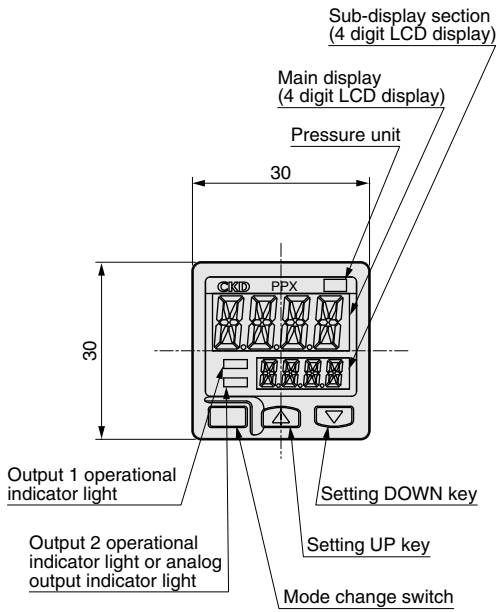
● PPX-R10NH R10PH



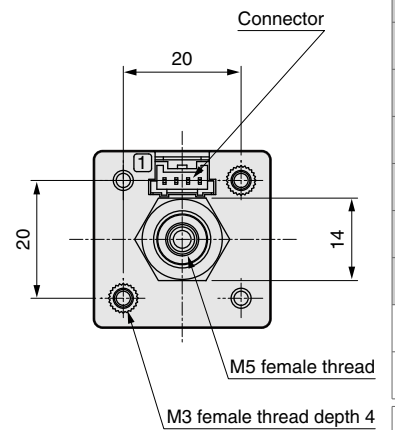
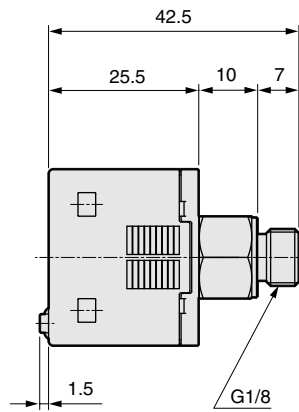
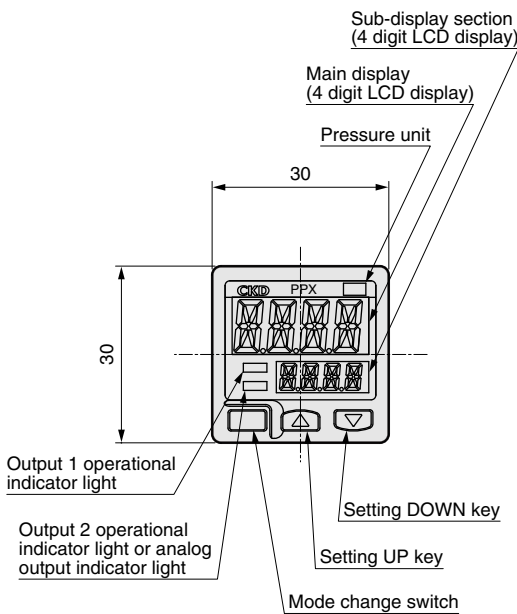
Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Dimensions

● PPX-R**-6M/6N (R/NPT thread)



● PPX-R**-6G (G thread)



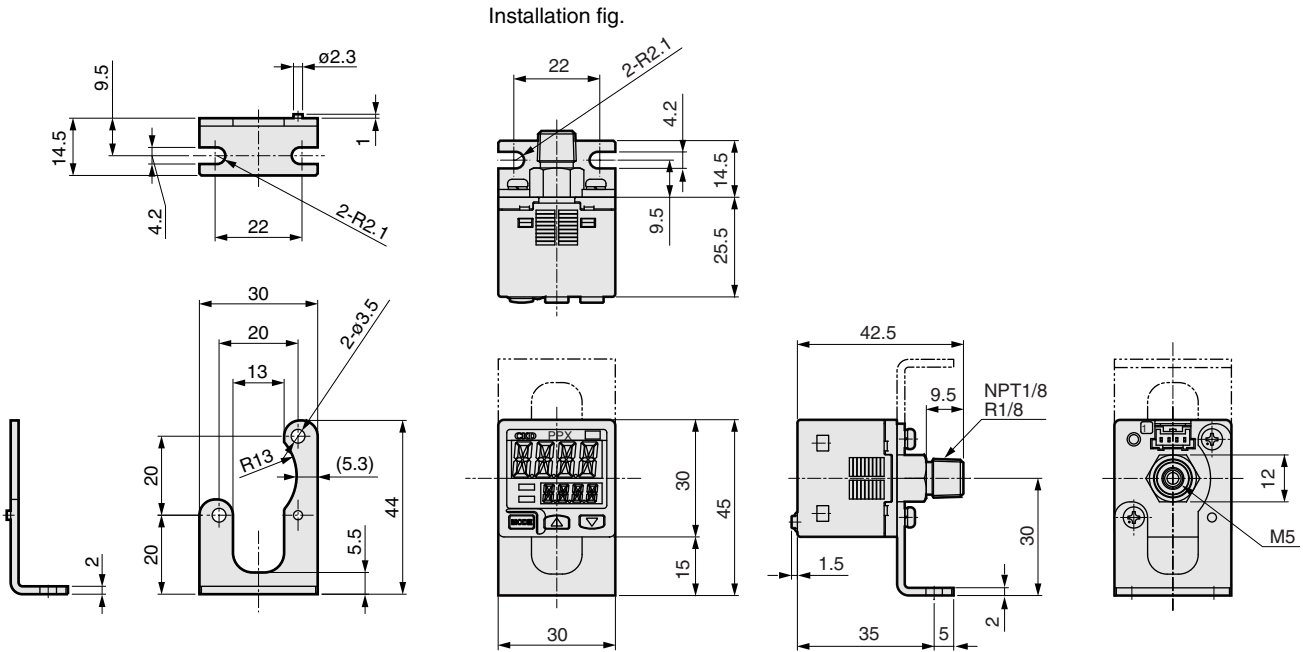
Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

With digital display
Pressure sensor

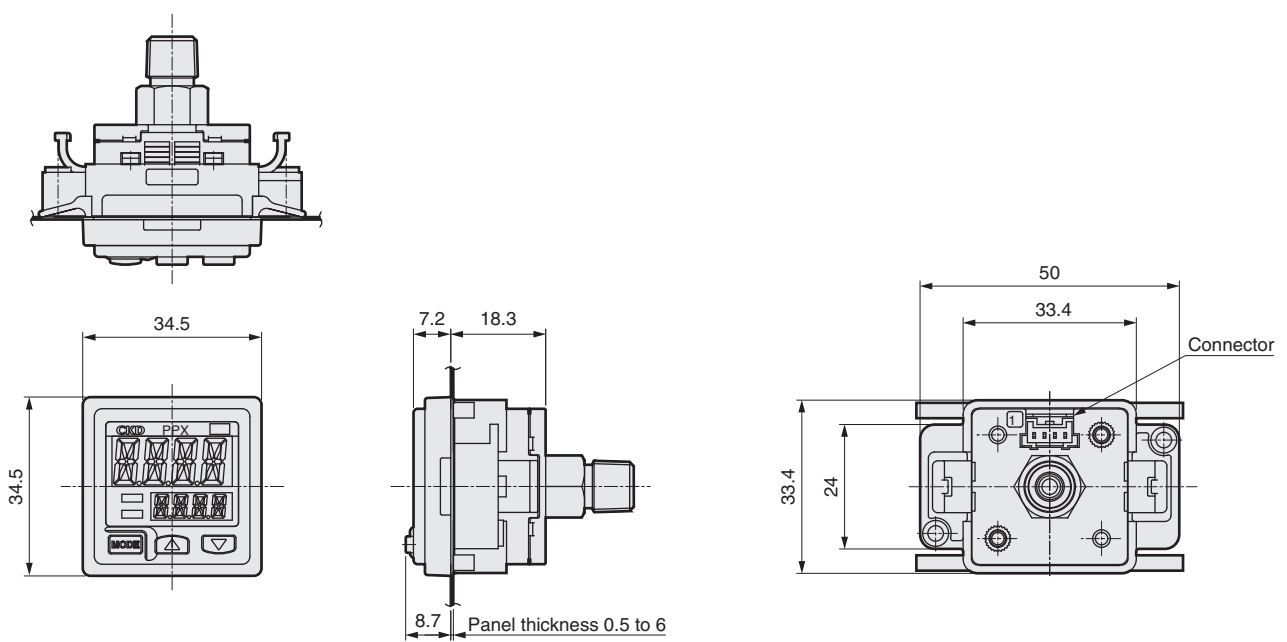
Dimensions with options



● Bracket (PPX-KL)

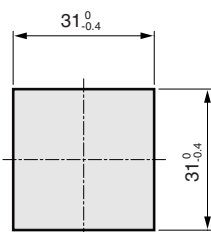


● Panel bracket(PPX-KHS) installation fig.

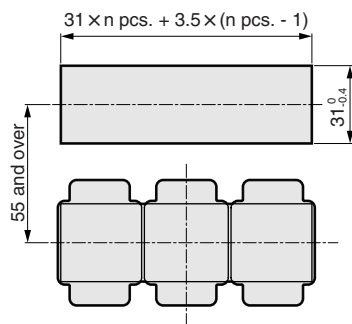


Panel cut dimension

Installing 1 pc.

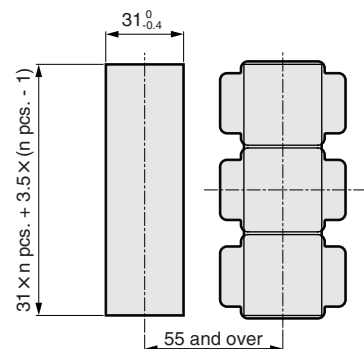


Installing consecutive n pcs. horizontally



(Note 1): Panel thickness must be 0.5 to 6mm.

Installing consecutive n pcs. vertically

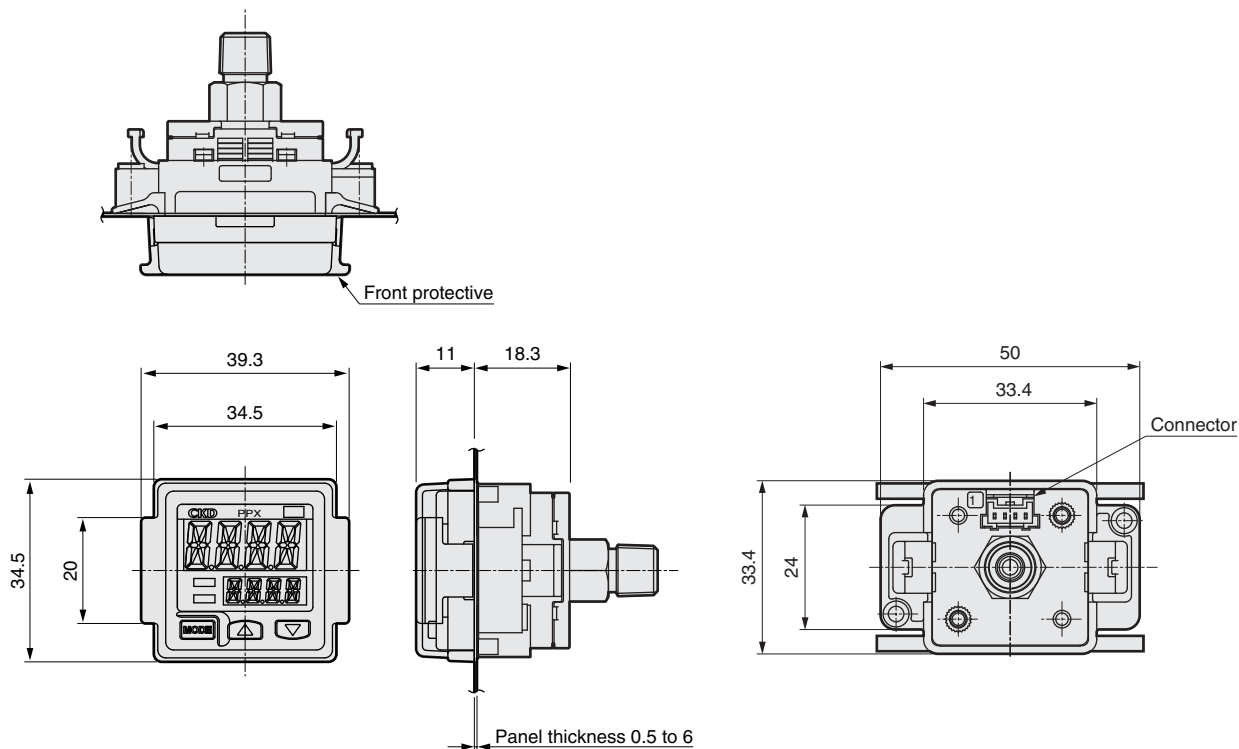


(Note 1): Panel thickness must be 0.5 to 6mm.

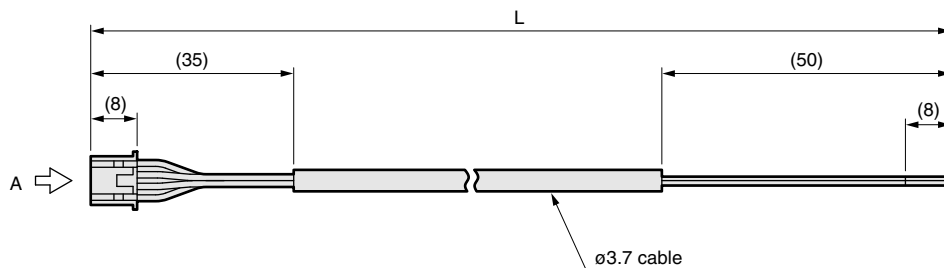
Dimensions with options



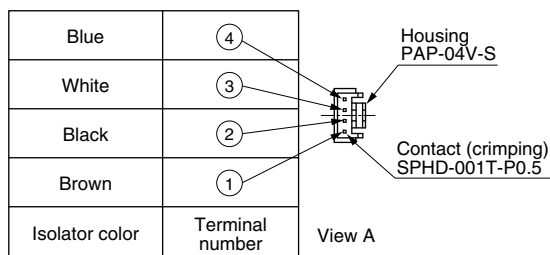
- Front protective cover (PPX-KCB) installation fig.



- Cable with connector (PPX-C*)



(JST MFG CO. LTD.)



Model no.	Cable length
PPX-C1	1m
PPX-C2	2m
PPX-C3	3m
PPX-C5	5m

- Connector set (PPX-CN)

- Housing : JST MFG CO. LTD. PAP-04V-S
- Contact : JST MFG CO. LTD. SPHD-001T-P0.5

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

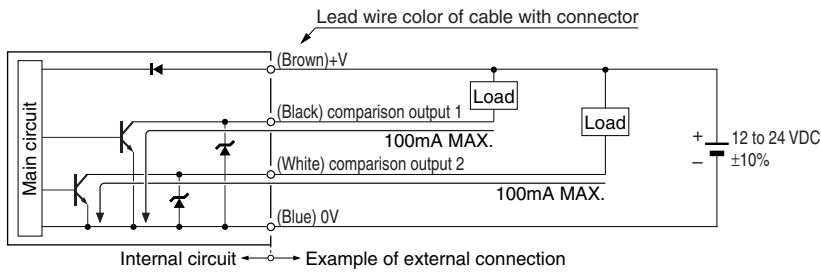
Ending

With digital display
Pressure sensor

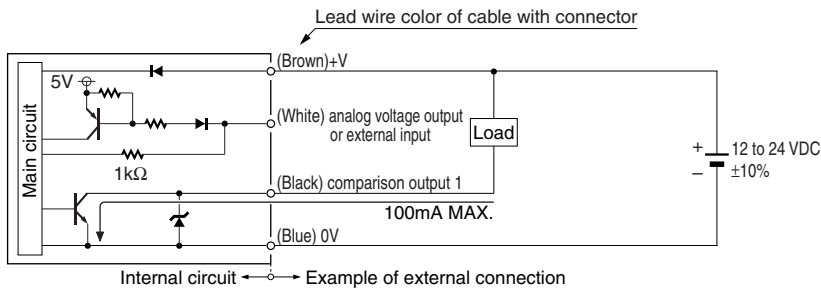
Circuit and connection method

NPN output type

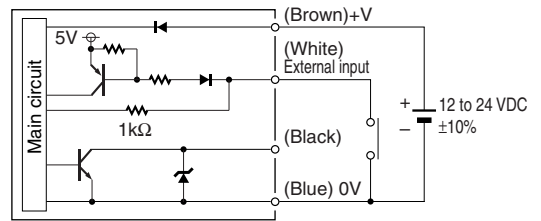
● Standard type



● High-function type

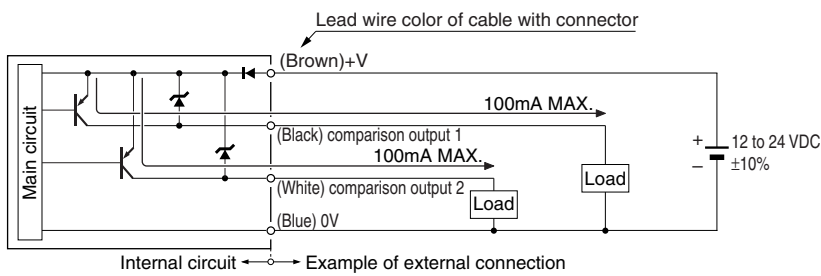


(Example of external input connection)

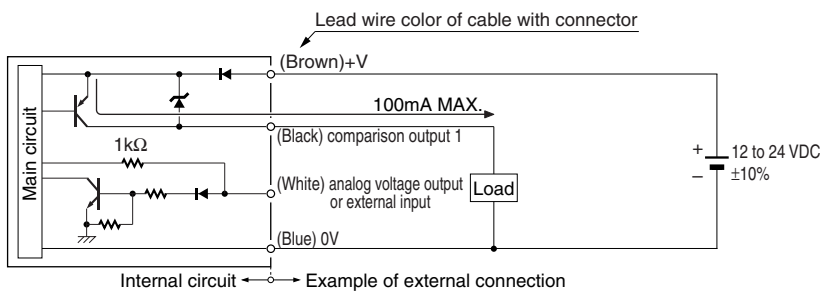


PNP output type

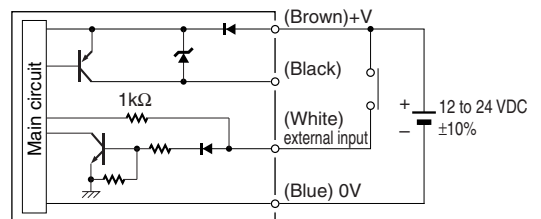
● Standard type



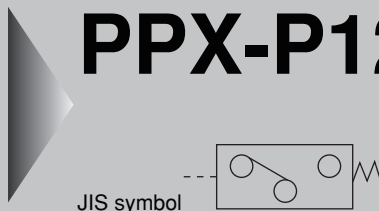
● High-function type



(Example of external input connection)



PPX-P12 Series



Overview

- Oil-prohibited treatment (degreasing) at gas contact areas (piping ports, etc.)
- Silicone grease-free at gas contact areas (no greas used at gas contact areas)

Features

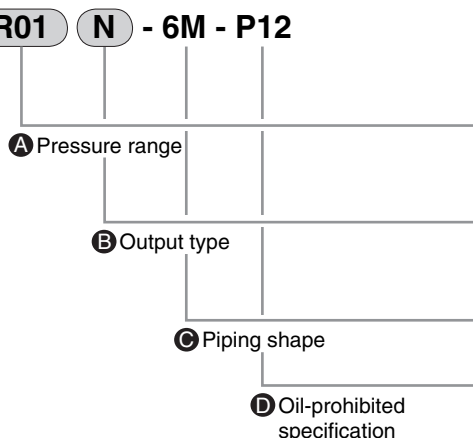
- Ideal for liquid crystal, semiconductor, food, medical, and electronic component applications, etc., where grease must not be present.
- Ideal for pressure detection on painting lines because no grease is used.

Specifications

Specifications are the same as standard type. Refer to page 1100 for details.

How to order

PPX- R01 N - 6M - P12



Symbol	Descriptions
A	Pressure range
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
B	Output type
N	NPN transistor output 2 point
NH	NPN transistor output 1 point + analog voltage output or external input
C	Piping shape
6M	R 1/8, M5 female thread
D	Oil-prohibited specification
P12	Oil-prohibited type

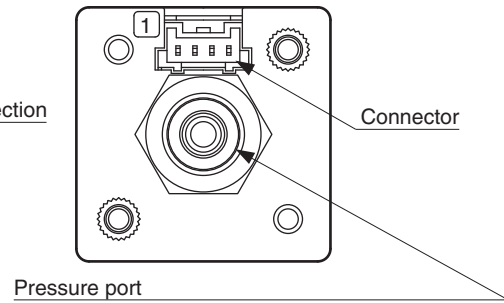
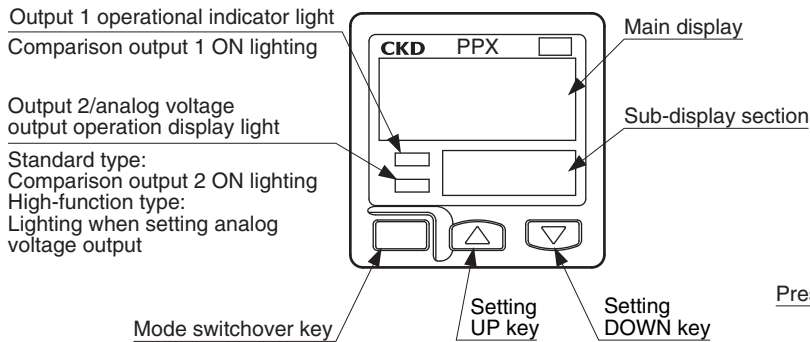
* 2m connector cable attached.

Dimensions

Dimensions are the same as standard type. Refer to page 1103 for details.

- Refrigerating type dryer
- Desiccant type dryer
- High polymer membrane type dryer
- Air filter
- Auto. drain / others
- F.R.L. (Module unit)
- F.R.L. (Separate)
- Compact F.R.
- Precise regulator
- F.R.L. (Related products)
- Clean F.R.
- Electro pneumatic regulator
- Air booster
- Speed control valve
- Silencer
- Check valve / others
- Joint / tube
- Vacuum filter
- Vacuum regulator
- Suction plate
- Magnetic spring buffer
- Mechanical pressure SW
- Electronic pressure SW
- Contact / close contact cont. SW
- Air sensor
- Pressure SW for coolant
- Small flow sensor
- Small flow controller
- Flow sensor for air
- Flow sensor for water
- Total air system
- Total air system (Gamma)
- Ending

Operation mode and output operation

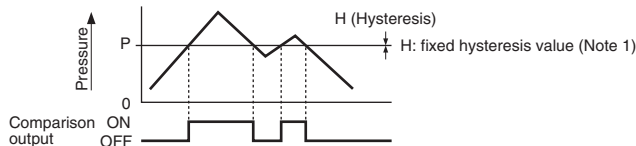


Operation mode and output operation

- The output mode can be selected from EASY mode, hysteresis mode, or window comparator mode for comparison output 1 and comparison output 2.
 See "Menu setting mode" (page 1113), Comparison output 1/2 output mode setting, for details.

EASY MODE

- This mode is used to turn comparison output on or off.



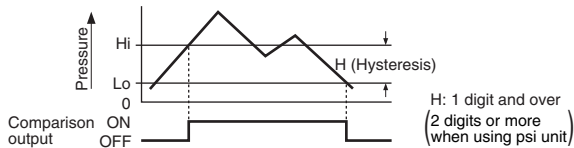
Note 1: Hysteresis can be set to eight stages.

See "PRO mode" (page 1114), Changing fixed hysteresis, for details on setting.

Note 2: "P-1" appears on the sub display for comparison output 1, and "P-2" appears for comparison output 2.

Hysteresis mode

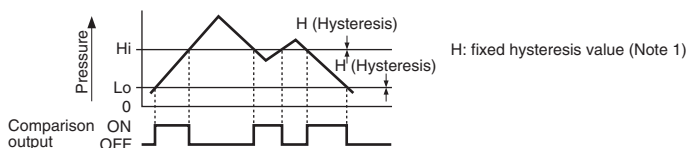
- This mode randomly sets comparison output hysteresis and turns it on or off.



Note 1: "Hi-1" and "Lo-1" appear on the sub display for comparison output 1, and "Hi-2" and "Lo-2" for comparison output 2.

Window comparator mode

- This mode is used to turn comparison output on or off within the setting range.



Note 1: Hysteresis can be set to eight stages.

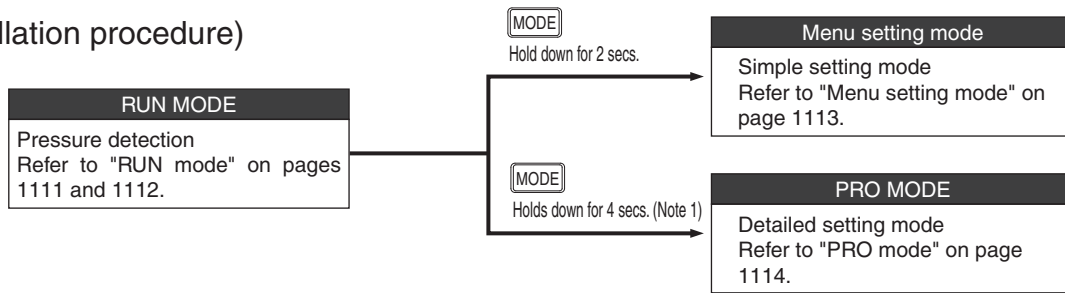
See "PRO mode" (page 1114), Changing fixed hysteresis, for details on setting.

Note 2: "Hi-1", "Lo-1" appears on the sub display for comparison output 1, and "Hi-2", "Lo-2" appears for comparison output 2.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Setting

(Installation procedure)

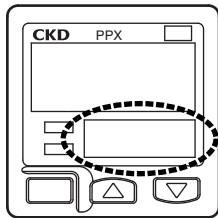


(Note 1): The menu setting mode appears two seconds after the mode select key is pressed. Continue holding down the select key.

RUN MODE

Setting threshold

- See "Menu setting mode" (page 1113), Comparison output 1/2 output mode setting, and Analog voltage output/external input selection for details on setting.



When the threshold is set, only the sub display changes, so only sub displays are shown below.

Note 1: "UP" (maximum over) or "DOWN" (maximum over) lights on the sub display if the set pressure range is exceeded. When the threshold is set for the hysteresis mode/window comparator mode, "DOWN" is displayed if the Hi side threshold is lower than the Lo side threshold.

(Standard type)

(Setting conditions (1))

Comparison output 1 output mode : "EASY" (EASY MODE)
Comparison output 2 output mode : "OFF" (OFF)

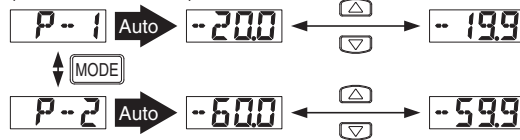
(state of RUN MODE)



(Setting conditions (2))

Comparison output 1 output mode : "EASY" (EASY MODE)
Comparison output 2 output mode : "EASY" (EASY MODE)

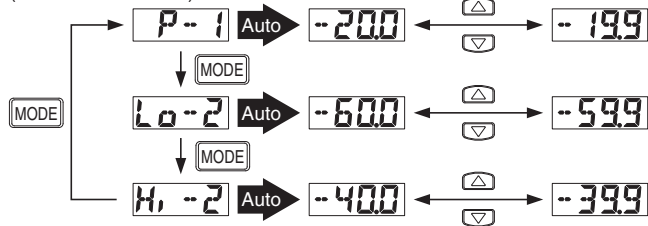
(state of RUN MODE)



(Setting conditions (3))

Comparison output 1 output mode : "EASY" (EASY MODE)
Comparison output 2 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)

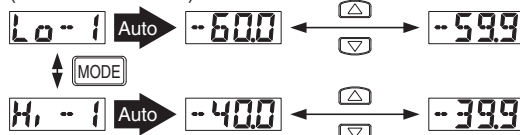
(state of RUN MODE)



(Setting conditions (4))

Comparison output 1 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)
Comparison output 2 output mode : "OFF" (OFF)

(state of RUN MODE)



With digital display
Pressure sensor

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

(Setting conditions (5))
 Comparison output 1 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)
 Comparison output 2 output mode : "EASY" (EASY MODE)

(Setting conditions (6))
 Comparison output 1 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)
 Comparison output 2 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)

(High-function type)

(Setting conditions (7))
 Comparison output 1 output mode : "EASY" (EASY MODE)
 Switching analog voltage output/external input : "ROUT" (analog voltage output)

(Setting conditions (8))
 Comparison output 1 output mode : "EASY" (EASY MODE)
 Switching analog voltage output/external input : "RREF" (auto-reference input) or "ZERO" (remote zero adjusting input)

(Setting conditions (9))
 Comparison output 1 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)
 Switching analog voltage output/external input : "ROUT" (analog voltage output)

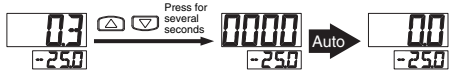
(Setting conditions (10))
 Comparison output 1 output mode : "HYS" (hysteresis mode) or "WCOMP" (window comparator mode)
 Switching analog voltage output/external input : "RREF" (auto-reference input) or "ZERO" (remote zero adjusting input)

(Note 1): Auto-reference and remote zero adjusting value are shown Refer to "Auto reference function" on page 1116, and to "Remote zero adjusting function" on page 1117 for details.

(Common)

Zero adjustment

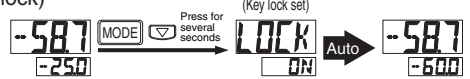
- The zero adjustment function forcibly sets the pressure display to zero when the pressure port is released to atmospheric pressure.



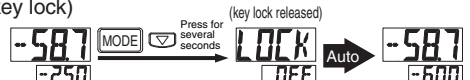
Key lock

- The key lock function disables key operations so that conditions set for setting modes cannot be mistakenly changed.

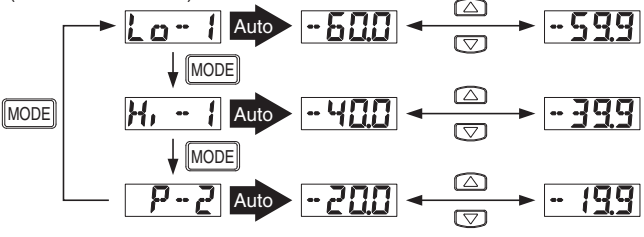
(Setting key lock)



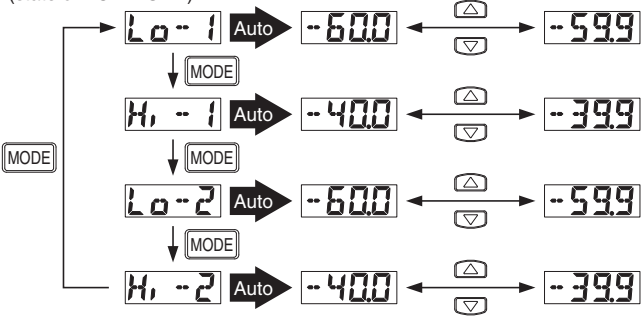
(Releasing key lock)



(state of RUN MODE)



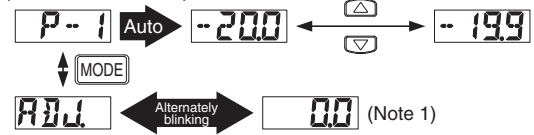
(state of RUN MODE)



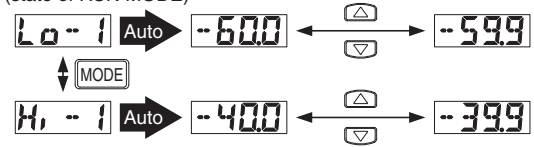
(state of RUN MODE)



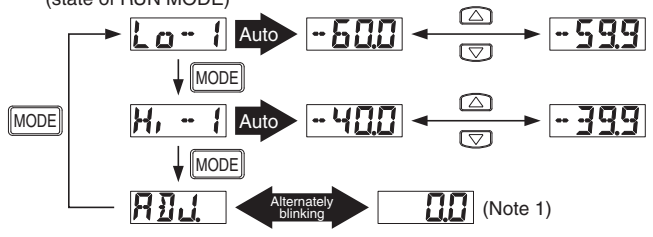
(state of RUN MODE)



(state of RUN MODE)



(state of RUN MODE)



Peak/bottom hold

- The peak and bottom hold function displays peak and bottom varying pressure.
- The peak value is displayed on the main display, and the lowest value is displayed on the sub display.

(Setting peak/bottom hold)



(Releasing peak/bottom hold)



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

With digital display
Pressure sensor

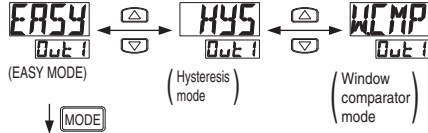
Menu setting mode

- If the mode select key is held down for two seconds during the RUN mode, the menu setting mode opens.
- If the mode select key is held down long while a setting is made, the RUN mode opens and changed items are set.
- The display at the left end shows defaults (factory default).

RUN Mode

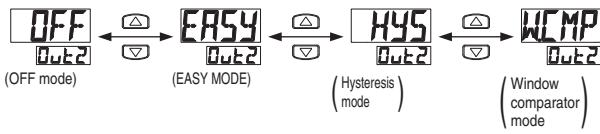
↓ (MODE) Hold down for 2 secs.

Setting comparison output 1 output mode



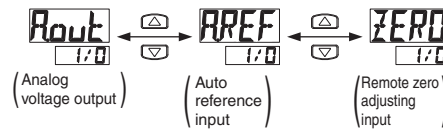
(Standard type)

Setting comparison output 2 output mode (Note 1)



(High-function type)

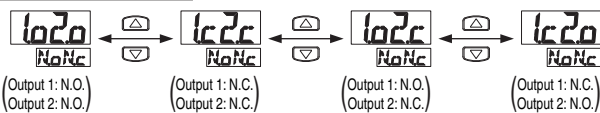
Switching analog voltage output/external input



↓ (MODE)

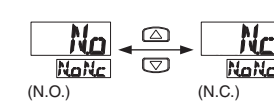
(Standard type)

Switching N.O./N.C. (Note 1) (Note 2)



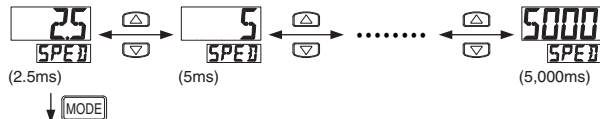
(High-function type)

Switching N.O./N.C. (Note 2)



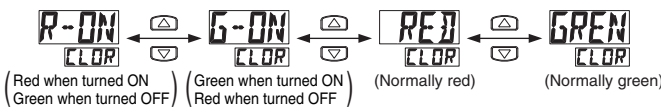
↓ (MODE)

Setting response time



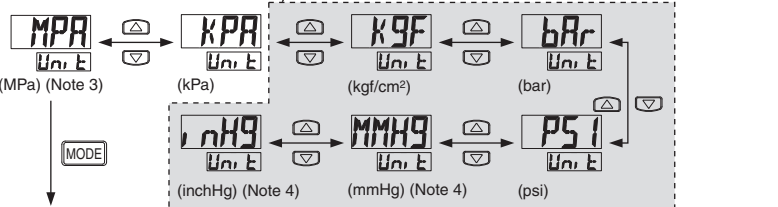
↓ (MODE)

Switching main display section display color



↓ (MODE)

Switching unit



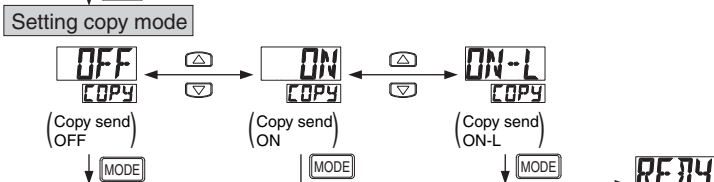
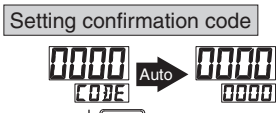
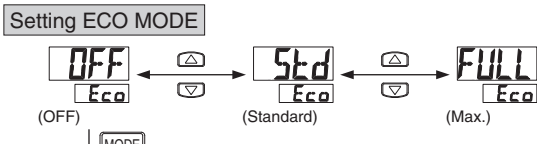
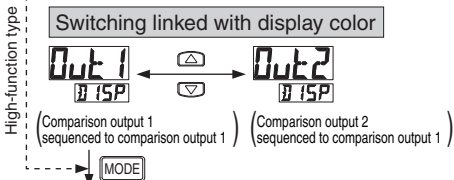
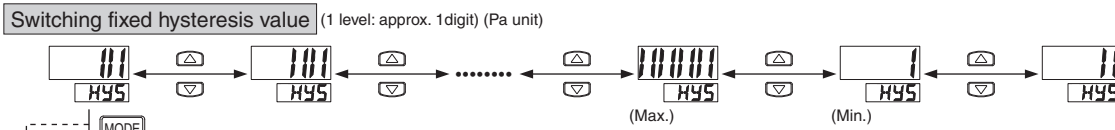
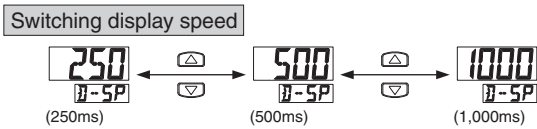
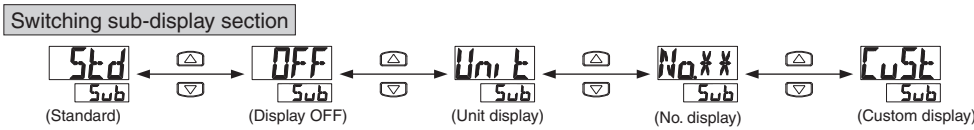
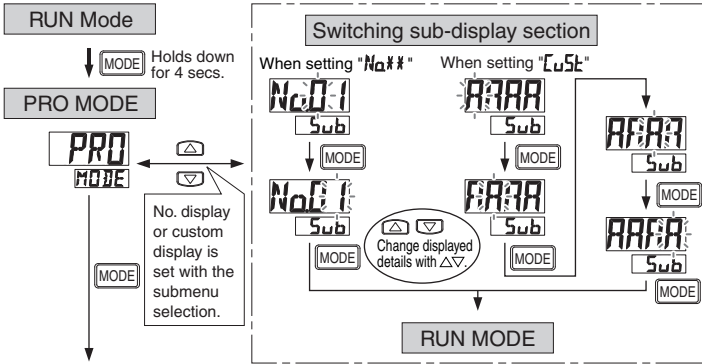
RUN Mode

- Note 1: If the comparative output 2 output mode setting is set to OFF, the display at N.O./N.C. changeover is the same as for the high-function type.
- Note 2: The default for the high pressure type is "No". The default for the low pressure type is "Nc".
- Note 3: The default of the low pressure type is "KPA". "MPA" is not displayed.
- Note 4: The high pressure type is not displayed.

Setting descriptions	Descriptions
Setting comparison output 1 output mode	Set comparison output 1 output mode.
Setting comparison output 2 output mode (Only standard type)	Set comparison output 2 output mode.
Switching analog voltage output / external input (Only high-function type)	The item can be selected from analog voltage output, automatic reference input, or remote zero adjustment input.
Switching N.O./N.C.	Set normal open (N.O.) or normal close (N.C.).
Setting response time	Set the response time.
Switching main display section display color	Response time can be selected from 2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1,000 ms, or 5,000 ms.
Switching unit	Colors on the main display can be changed.
	The pressure unit can be changed.

PRO MODE

- If the mode select key is held down for four seconds during the RUN mode, the PRO mode opens.
- If the mode select key is held down long while a setting is made, the RUN mode opens and changed items are set.
- The display at the left end shows defaults (factory default).



Setting descriptions	Descriptions
Switching sub-display section	Set the sub display for the RUN mode. [<i>OFF</i>] : Nothing is displayed. [<i>Unit</i>] : Displays the current pressure unit. [<i>N.α.#</i>] : Displays a random number. [<i>LUSt</i>] : Displays a random number, alphabetic character (some characters cannot be displayed), and symbol.
Switching display speed	Set the speed of the pressure displayed on the main display.
Switching fixed hysteresis value	Set hysteresis for the EASY mode and window comparator mode. (8 stages)
Switching linked with display color (Only standard type)	Whether to sequence comparison output 1 or comparison output 2 to details set when the main display's color changes in the menu setting mode can be selected.
Setting ECO MODE	Consumed power can be reduced. [<i>OFF</i>] : Normal (ECO MODE off) [<i>Std</i>] : Display is dimmed if no key is pressed for 5 seconds in RUN mode. [<i>FULL</i>] : Display is turned off if no key is pressed for 5 seconds in RUN mode. The normal display appears temporarily if any key is pressed.
Setting confirmation code	Currently set details can be confirmed. Check codes in the List of Codes.
Setting copy mode	Details set for the master sensor can be copied to the slave sensor. See "Setting copy function" (page 1118) for details. [<i>ON</i>] : Set details are copied. [<i>ON-L</i>] : Set details are copied and slave side slave sensor keys are locked.
Setting reset	Settings are returned to defaults.

Code list

Code	1st digit		2nd digit			3rd digit	4th digit	
			Standard type		High-function type		Main display section display color	Only standard type
	Comparison output 1 output mode	N.O./N.C.	Comparison output 2 output mode	N.O./N.C.	Analog voltage output/external input	Threshold display		Display color interlock
0	EASY	N.O.	OFF	OFF	Analog voltage output	P-1, Lo-1	Red when turned ON	Comparison output 1
1		N.C.	EASY	N.O.	Automatic reference	Hi-1		Comparison output 2
2	Hysteresis	N.O.		Hysteresis	N.C.	Remote zero adjusting	P-2, Lo-2	Green when turned ON
3		N.C.	N.O.		-	Hi-2	Comparison output 2	
4	Window comparator	N.O.	Window comparator	N.C.	-	ADJ.	Normally red	Comparison output 1
5		N.C.		N.O.	-	-		Comparison output 2
6	-	-	-	N.C.	-	-	Normally green	Comparison output 1
7	-	-	-	-	-	-		Comparison output 2



Code	5th digit	6th digit	7th digit	8th digit
	Response time	Switching unit	Display speed	ECO MODE
0	2.5ms	MPa	250ms	OFF
1	5ms	kPa	500ms	Std
2	10ms	kgf/cm ²	1,000ms	Full
3	25ms	bar	-	-
4	50ms	psi	-	-
5	100ms	mmHg	-	-
6	250ms	inchHg	-	-
7	500ms	-	-	-
8	1,000ms	-	-	-
9	5,000ms	-	-	-

Limited to export models with unit select functions

- Refrigerating type dryer
- Desiccant type dryer
- High polymer membrane type dryer
- Air filter
- Auto. drain / others
- F.R.L. (Module unit)
- F.R.L. (Separate)
- Compact F.R.
- Precise regulator
- F.R.L. (Related products)
- Clean F.R.
- Electro pneumatic regulator
- Air booster
- Speed control valve
- Silencer
- Check valve / others
- Joint / tube
- Vacuum filter
- Vacuum regulator
- Suction plate
- Magnetic spring buffer
- Mechanical pressure SW
- Electronic pressure SW
- Contact / close contact cont. SW
- Air sensor
- Pressure SW for coolant
- Small flow sensor
- Small flow controller
- Flow sensor for air
- Flow sensor for water
- Total air system
- Total air system (Gamma)
- Ending

With digital display Pressure sensor

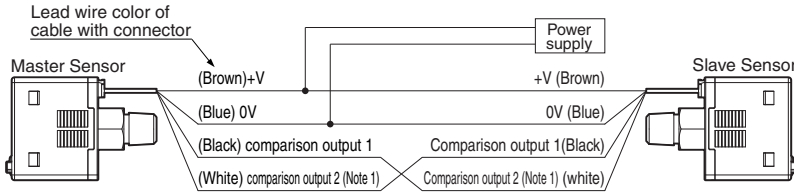
Setting copy function

- This function copies settings from the master sensor to the slave sensor.

- Settings can be copied only between the same models.
Data cannot be copied between different models.
- The setting copy function can copy settings for one master sensor to one slave sensor.

(Installation procedure)

- (1) Set the master sensor setting copy mode to Copy ON or ON-L, and press the mode select key to prepare for copying.
See "PRO mode" (page 1114), Setting copy mode, for details.
- (2) Turn master sensor power off.
- (3) Connect the master sensor to the slave sensor as shown below.



Note 1: Analog voltage output and external input are connected for the high-function type.

- (4) Turn the power for the master sensor and slave sensor ON simultaneously. (Note 2) (Note 3)
 - (5) Setting details are encoded in 16-bit code and displayed in orange on the main sensor display. Copying begins.
 - (6) The same code as step (5) is displayed in green on the slave sensor's display. "OK" is displayed on the sub display when copying finishes.
 - (7) Turn master sensor and slave sensor power off, and disconnect wires.
- *To continue copying settings for a different sensor, repeat steps (3) to (6).

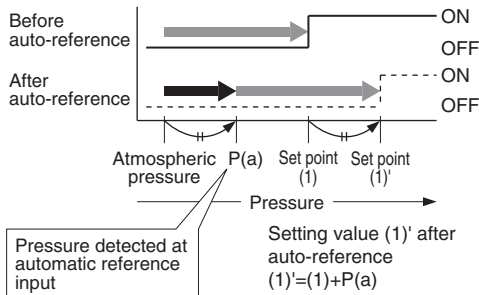
Note 2: Set details may not be copied if sensor power is not turned on simultaneously.
Note 3: Pulse output is output to comparison output 1 when power is turned on.

(Canceling master sensor setting copy mode)

- (1) Turn master sensor power on. With slave sensor wiring disconnected.
- (2) Press the mode select key for 2 seconds.

Automatic reference function (high-function type only)

- The automatic reference function compensates for the setting using the pressure detected at automatic reference input as the reference pressure.
- Setting value 1' is automatically compensated for as "setting value 1 + P (a)" using pressure value P (a) detected at automatic reference input as the reference.



Valid setting range and setting pressure range after compensation

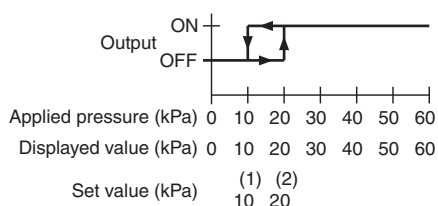
- The set pressure range is wider than the rated pressure range to comply with the automatic reference function.

When using automatic reference input, if the compensated-for setting exceeds the set pressure range, the setting is automatically compensated for in the set pressure range.
Check that the set pressure range is not exceeded.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

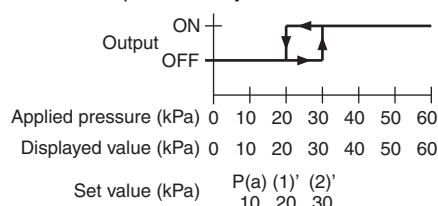
Operation chart

(normal (N.O. setting for each comparison output))



〈 Auto-reference input (N.O. setting for each comparison output) 〉

- Detection pressure when auto-reference input: 10kPa
- Output mode: hysteresis mode



Note 1: The setting shifts the same in EASY and window comparator modes.

- The pressure detected at automatic reference input is set to zero when the setting for the analog voltage output/external input select function is set or power is turned on again.
- The automatic reference input can be confirmed when the RUN mode threshold is set. See setting the threshold in "RUN mode" (page 1113) for details.

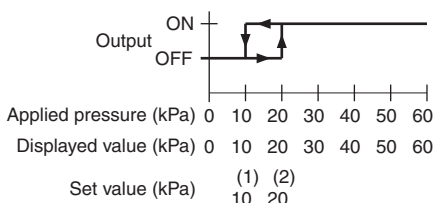
Remote zero adjusting (only high-function type)

- The remote zero adjustment function forcibly sets the pressure to zero when the external signal is input.

The setting is not compensated for when remote zero adjustment is input. Check that pressure and setting for the remote zero adjustment function do not exceed the set pressure range.

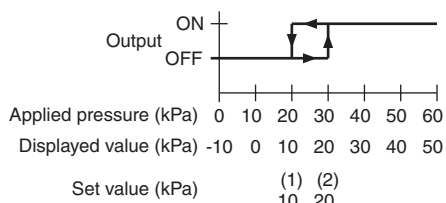
Operation chart

(normal (N.O. setting for each comparison output))



〈 Remote zero adjusting input (N.O. setting for each comparison output) 〉

- Pressure for remote zero adjusting input: 10kPa
- Output mode: hysteresis mode



Note 1: The setting shifts the same in EASY and window comparator modes.

- The remote zero adjustment function is cleared to zero when the setting for the analog voltage output/external input select function is set or power is turned on again, and operation returns to normal using atmospheric pressure as a reference. The remote zero adjustment can be confirmed when the RUN mode threshold is set. See setting the threshold in "RUN mode" (page 1111) for details.

Error display

Error display	Descriptions	Measures
E-1	The load was short-circuited and overcurrent flowed.	Turn power off and check the load.
E-3	Pressure was applied during zero point adjustment.	Release pressure applied to the pressure port to atmospheric pressure and adjust the zero point again.
E-4	External input was made outside the rated pressure range.	Return applied pressure to within the rated pressure range.
E-5	Communication error (disconnection, connection fault, etc.)	When using the copy function, check wiring.
E-6	Communication error (different models)	When using the copy function, confirm that the same models are used.
✖ ✖ ✖	Applied pressure exceeds the maximum display pressure range.	Return applied pressure to within the rated pressure range.
.. ✖ ✖ ✖	Applied pressure exceeds the minimum (reverse pressure) display pressure range.	

With digital display
Pressure sensor

Setting operation example EASY MODE

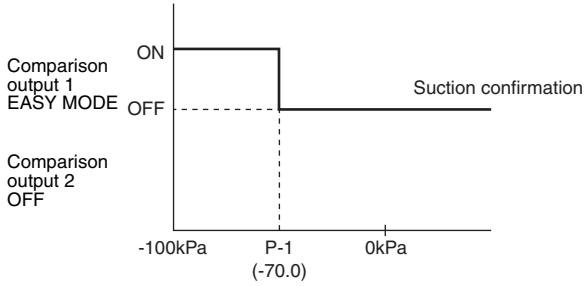
Note 1: This is an example of settings from the default when purchased (factory default).

Note 2: If setting conditions are unclear, conduct resetting of the settings in PRO mode, reset to default mode, then start use.

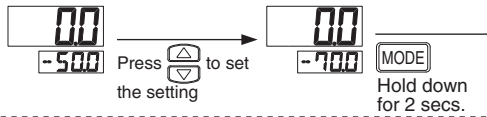
● Suction confirmation

– EASY MODE
R01 type (-100.0 to 100.0kPa)

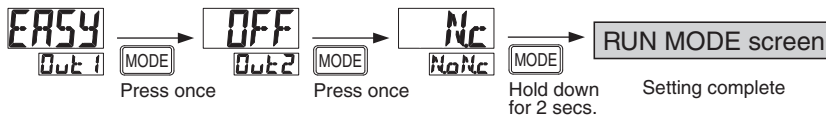
- Start from the mode (RUN mode) enabled when power is turned on.
- In a mode other than the RUN mode, Press the "MODE" key, and enter the RUN mode.



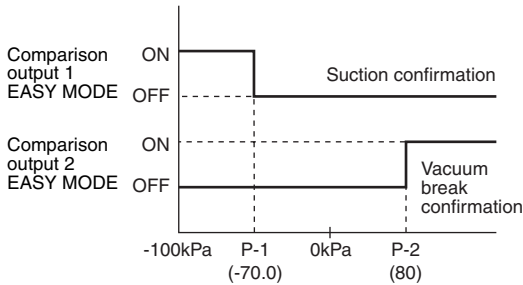
RUN MODE screen



Menu setting mode screen



● Suction confirmation + vacuum break confirmation



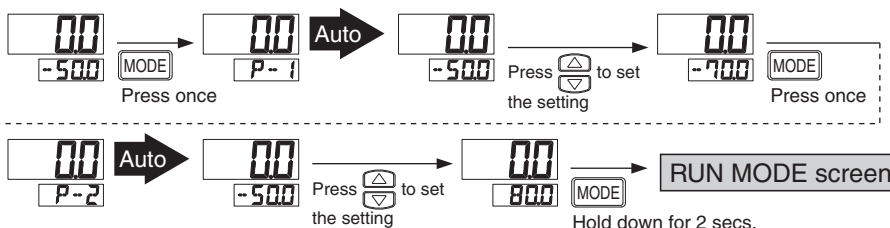
RUN MODE screen



Menu setting mode screen



RUN MODE screen



- Refrigerating type dryer
- Desiccant type dryer
- High polymer membrane type dryer
- Air filter
- Auto. drain / others
- F.R.L. (Module unit)
- F.R.L. (Separate)
- Compact F.R.
- Precise regulator
- F.R.L. (Related products)
- Clean F.R.
- Electro pneumatic regulator
- Air booster
- Speed control valve
- Silencer
- Check valve / others
- Joint / tube
- Vacuum filter
- Vacuum regulator
- Suction plate
- Magnetic spring buffer
- Mechanical pressure SW
- Electronic pressure SW
- Contact / close contact cont. SW
- Air sensor
- Pressure SW for coolant
- Small flow sensor
- Small flow controller
- Flow sensor for air
- Flow sensor for water
- Total air system
- Total air system (Gamma)
- Ending

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

With digital display
Pressure sensor

Setting operation example HYS MODE (hysteresis mode)

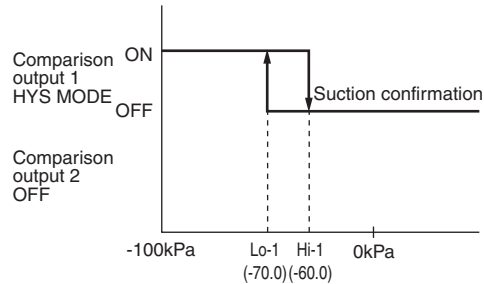
Note 1: This is an example of settings from the default when purchased (factory default).

Note 2: If setting conditions are unclear, conduct resetting of the settings in PRO mode, reset to default mode, then start use.

● Suction confirmation

- HYS MODE (hysteresis MODE)
R01 type (-100.0 to 100.0kPa)

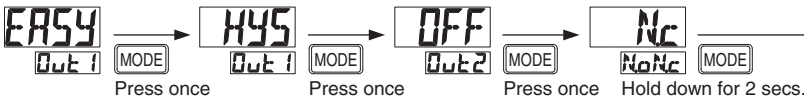
- Start from the mode (RUN mode) enabled when power is turned on.
- In a mode other than the RUN mode, hold down the "MODE" key, and enter the RUN mode.



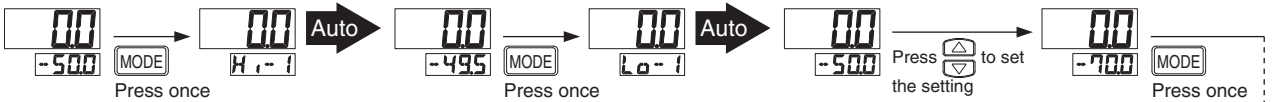
RUN MODE screen



Menu setting mode screen



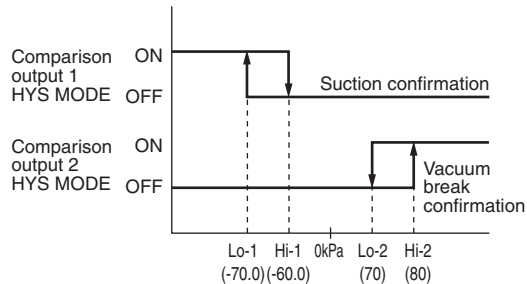
RUN MODE screen



RUN MODE screen



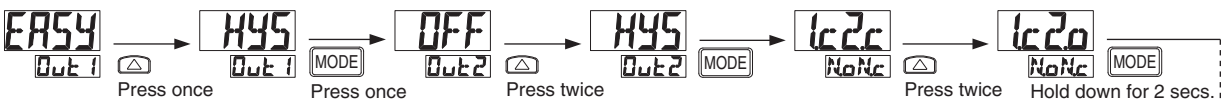
● Suction confirmation + vacuum break confirmation



RUN MODE screen



Menu setting mode screen



RUN MODE screen



RUN MODE screen



RUN MODE screen



RUN MODE screen



Setting operation example WCMP MODE (window comparator mode)

Note 1: This is an example of settings from the default when purchased (factory default).

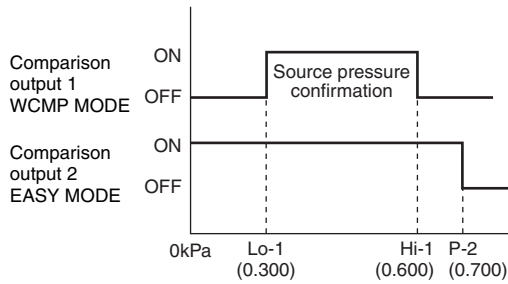
Note 2: If setting conditions are unclear, conduct resetting of the settings in PRO mode, reset to default mode, then start use.

● Source pressure confirmation

- WCMP MODE (window comparator mode)

RO1 type (-0.100 to 1.000MPa)

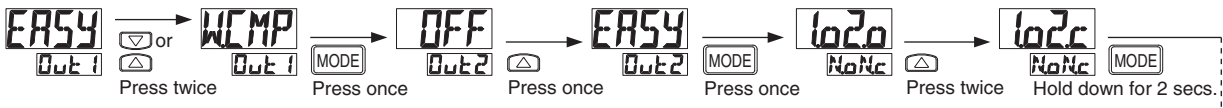
- Start from the mode enabled when power is turned on (RUN mode).
- In a mode other than the RUN mode, hold down the "MODE" key, and enter the RUN mode.



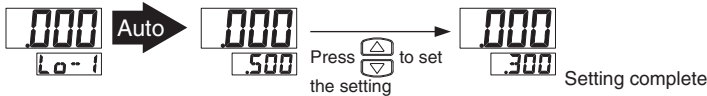
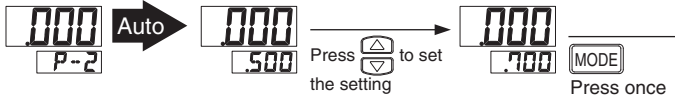
RUN MODE screen



Menu setting mode screen



RUN MODE screen



MEMO

Horizontal lines for taking notes, starting from the left margin and extending to the right margin of the memo area.

- Refrigerating type dryer
- Desiccant type dryer
- High polymer membrane type dryer
- Air filter
- Auto. drain / others
- F.R.L. (Module unit)
- F.R.L. (Separate)
- Compact F.R.
- Precise regulator
- F.R.L. (Related products)
- Clean F.R.
- Electro pneumatic regulator
- Air booster
- Speed control valve
- Silencer
- Check valve / others
- Joint / tube
- Vacuum filter
- Vacuum regulator
- Suction plate
- Magnetic spring buffer
- Mechanical pressure SW
- Electronic pressure SW
- Contact / close contact cont. SW
- Air sensor
- Pressure SW for coolant
- Small flow sensor
- Small flow controller
- Flow sensor for air
- Flow sensor for water
- Total air system
- Total air system (Gamma)
- Ending

With digital display
Pressure sensor

Easy use with wide variations!!

Common operations are used for both the sensor integrated type and separated type to help users. IP65 drip-proof structure provides outstanding reliability even in adverse environment.

Full-range coupling pressure lets pressure from vacuum to positive pressure be measured.

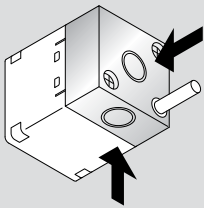
Sensor Integrated type



* PPD3-KL installation state

- Semiconductor and stainless steel diaphragm sensors are available in a series with a common mounting structure.
- Various port shapes available

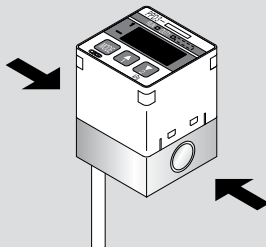
● Rc1/8 2 direction port (Rear side / down direction)



(Port type)

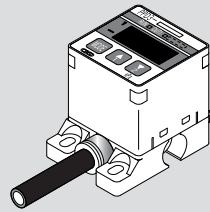
(-6B)

● Rc1/8 through port (Axial)



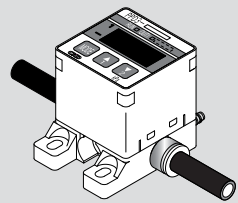
(-6T)

● ø6 push-in joint (Down direction)



(-6HD)

● ø6 push-in joint through port (Axial)



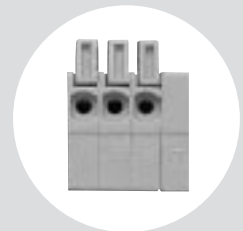
(-6HT)

Sensor separate type



* PPD3-KHS-D installation state

Freely combined displays and sensors!!



Just insert into the terminal block to connect!!

Semiconductor sensor

Stainless steel diaphragm sensor

● R1/8



(Port type)

(-6)

● ø6 push-in joint



(-H6)

● ø6 plug



(-H6-B)

● Rc1/8



(-6B)

Select by application

Both sensor Integrated types and sensor separated types are available.

- Pressure can be adjusted and confirmed at hand (sensor Integrated type).
- Remote processing is possible (sensor separated type).

Use general air with stainless steel diaphragm sensor.

Stainless steel diaphragm and semiconductor sensors are available.

- Sensors can be used based on air line quality.
- All sensors have IP65-compliant drip-proof structures.

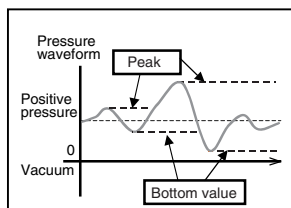
Easy-to-use pressure port lineup

- Resin ports with Push-in joints (6HD, 6HT, H6) are available. These lightweight ports help save space.
- Through-port types (6T, 6HT, H6) are available. Ideal for suction and seating confirmation. Only minimum piping space is required.

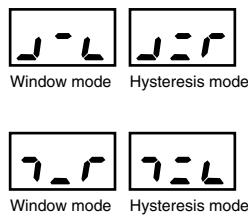
Ample functions

Convenient functions, including peak hold function, switch waveform display, forced switch, and pressure reading, enable efficient installation and setting.

Peak hold function



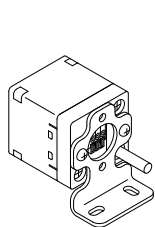
Switch waveform display



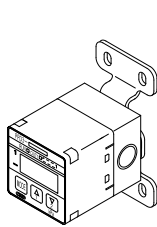
Different mounting bracket options! Optional

Install it anywhere.

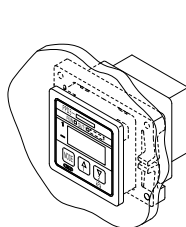
Radial installation



Parallel



Panel mount



Operation protective cover

Use this cover to protect the display panel and prevent incorrect input.

Friendly to the global environment

Helps conserve air pressure energy.

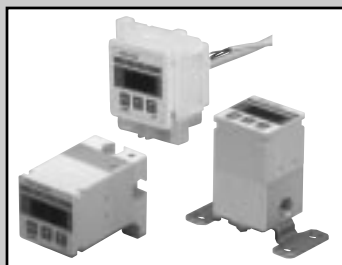


Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure switch
Pressure sensor

PPD3/PPD3-S Series



Refer to Intro 32 for details.



Overview

Pressure switch PPD3 Series is appropriate for pneumatic lines. Due to various port options, in addition to source pressure confirmation, suction pressure confirmation and contact confirmation, etc., are possible.

Features

- Semiconductor pressure sensor and stainless steel diaphragm pressure sensor series are available with common coupling structure. Model can be easily replaced according to air line conditions to improve.
- Push-in joint resin port (6HD/6HT/H6) is available. Light weight and space saving.
- Through type port (6T/6HT/H6) is available. This is appropriate for suction confirmation/contact confirmation. The product can be installed in minimum space.
- Efficient installation setting by convenience functions; peak hold, forcible switching, pressure reading functions, etc.
- CE marking as standard.

Sensor Integrated type/sensor separate type specifications

Descriptions	PPD3			PPD3-S		
	R10	R03	R01	R10	R03	R01
Pressure sensitive element	Diffused semiconductor pressure sensor			Single stainless steel diaphragm pressure sensor		
Working fluid	Air/non-corrosive gas			Air/non-corrosive gas/compressed air (including water and drain) Note 2		
Rated pressure range	-100 to 980kPa	-100 to 300kPa	-100 to 100kPa	-100 to 980kPa	-100 to 300kPa	-100 to 100kPa
Display unit	kPa	kPa	kPa	kPa	kPa	kPa
Display min. unit Note 1	1kPa					
Withstanding pressure	1.5MPa	0.6MPa	0.2MPa Note 2	2MPa	0.6MPa	0.6MPa
Display precision (25°C)	±2%F.S.			±3%F.S.		
Temperature characteristics (0 to 50°C)	±4%F.S.			±5%F.S.		
Leakage amount	1cm ³ /min (ANR) or less					
Indicator	3 digit orange LED display character height 8mm					
Power voltage	12 to 24 VDC±10% (ripple ratio 1% or less)					
Current consumption	50mA or less (60mA or less for sensor separate type)					
Switch output type	Integrated type	N: NPN transistor open collector output 2 point P: PNP transistor open collector output 2 point NA: NPN transistor open collector output 1 point + analog output 1 point PA: PNP transistor open collector output 1 point + analog output 1 point				
	Separate type	NA: NPN transistor open collector output 2 point + analog output 1 point PA: PNP transistor open collector output 2 point + analog output 1 point				
Switch output current	50mA or less					
Switch output voltage drop	2.4V or less					
Switch output responsiveness	Approx. 5msec					
Analog output	1 to 5V±0.1V Load impedance: 10kΩ and over					
Set point holding	EEPROM					
Lead wire	Main unit: Oil-resistant vinyl cord 4-conductor (0.3 mm ² insulator outer diameter ø1.1) 1m (sensor separated type is 5-conductor 0.2 mm ² insulator outer diameter ø1.0) Sensor-separated sensor: Oil-resistant vinyl cord 3-conductor (0.15 mm ² insulator outer diameter ø1.0) 3 m					
Working temperature/humidity	0 to 50°C / 0 to 85%RH (no dew condensation)					
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm, 2 hour per X, Y, Z direction					
Protective structure	Equivalent to IP65 Note 3 (Equivalent to IP40 for sensor separate type display device section)					
Protective circuit Note 4	Power reverse connection protection Switch output reverse connection protection Switch output load short-circuit protection					

Note 1: This indicates minimum display pressure, and does not guarantee display accuracy.

Note 2: Sensor separated is 0.3 MPa.

Note 3: When an atmosphere intake port is processed. (See page 1086.)

Note 4: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

Clean room specifications (catalog No. CB-033SA)

- Dust generation preventing structure for use in cleanrooms

PPD3 ————— P7*

PPD3 ————— P8*

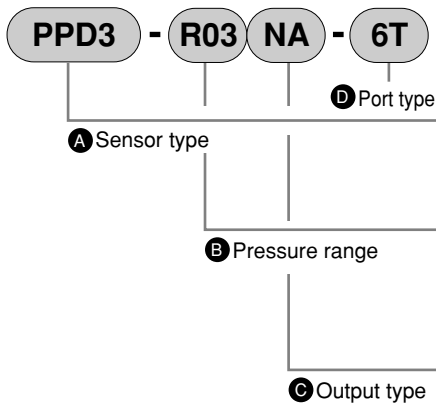
PPD3 ————— P9*

Circuit diagram and connection method

Refer to page 1135.

How to order

● Sensor Integrated type

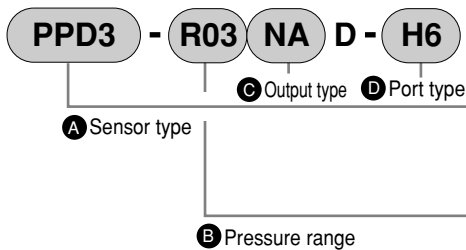


Symbol	Descriptions
A Sensor type	
PPD3	Semiconductor sensor
PPD3-S	Stainless steel diaphragm sensor
B Pressure range	
R10	-100 to 980kPa
R03	-100 to 300kPa
R01	-100 to 100kPa
C Output type	
N	NPN transistor output 2 point
P	PNP transistor output 2 point
NA	NPN transistor output 1 point + analog output 1 point
PA	PNP transistor output 1 point + analog output 1 point
D Port type	
6B	Rc1/8, 2 direction port rear side, lower outlet
6T	Axial Rc1/8, through port both sides outlet
6HD	Light weight port with 6mm push-in joint (downward)
6HT	Light weight through port with two 6mm push-in joints (horizontal both sides)

⚠ Note on selection guide

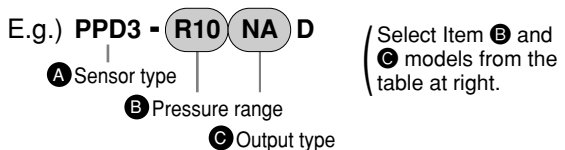
Mounting brackets and kits are not enclosed with the product. Refer to the following "Mounting bracket and kit" model information for the optional mounting bracket and kits.

● Sensor separate type

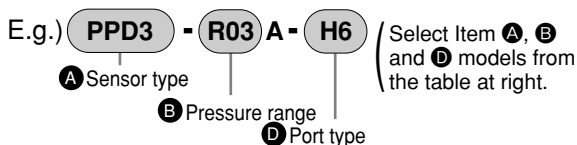


Symbol	Descriptions	
A Sensor type		
PPD3	Semiconductor sensor	
PPD3-S	Stainless steel diaphragm sensor	
B Pressure range		
R10	-100 to 980kPa	
R03	-100 to 300kPa	
R01	-100 to 100kPa	
C Output type		
NA	NPN transistor output 2 point + analog output 1 point	
PA	PNP transistor output 2 point + analog output 1 point	
D Port type		
6	R1/8	PPD3 (semiconductor sensor)
H6	6mm push-in joint	
H6-B	6mm plug	PPD3-S (stainless steel diaphragm sensor)
6B	Rc1/8	

● Discrete indicator model no.



● Discrete sensor model no.



⚠ Note on selection guide

Mounting brackets and kits are not enclosed with the product. Refer to the following "Mounting bracket and kit" model information for the optional mounting bracket and kits.

● Mounting bracket and kit

Refer to the following page.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending
Electronic pressure switch
Pressure sensor

PPD3/PPD3-S Series

● Mounting bracket and kit

PPD3 - KL - D

Ⓐ Model no.

Ⓑ Shape

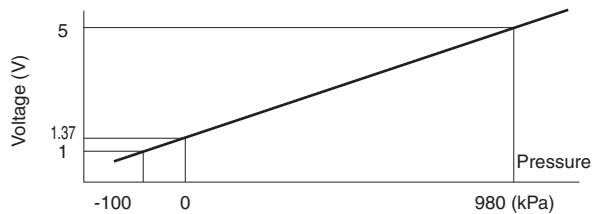
Symbol	Descriptions
Ⓐ Model no.	
PPD3-KL	Single side foot bracket (radial installation) (set screw attached)
PPD3-KD	Both sides foot bracket (axial installation) (set screw attached)
PPD3-KHS	Panel mount bracket set, with guard (ø6 Push-in joint attached for Integrated type)
PPD3-KC	Operation protective cover *1
Ⓑ Shape	
Blank	Sensor Integrated type *2
D	Sensor separate type

*1 PPD3-KC is common for sensors Integrated and separated so when selecting PPD3-KC for the sensor separated type, do not indicate a symbol for item Ⓑ shape.

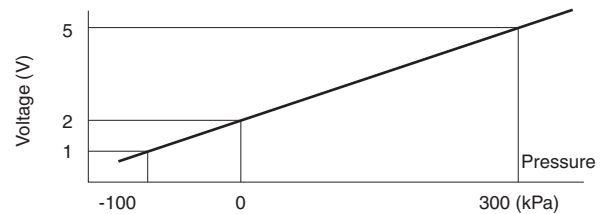
*2 This panel mounting method applies for port "6B".
It cannot be used with other ports.

Analog output voltage - pressure characteristics

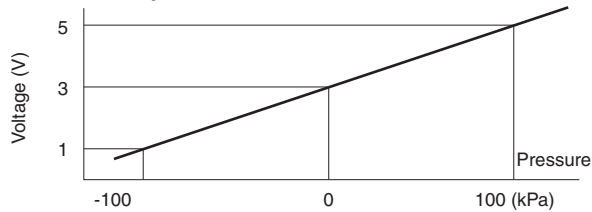
● PPD3(-S)-R10NA R10PA R10A



● PPD3(-S)-R03NA R03PA R03A



● PPD3(-S)-R01NA R01PA R01A



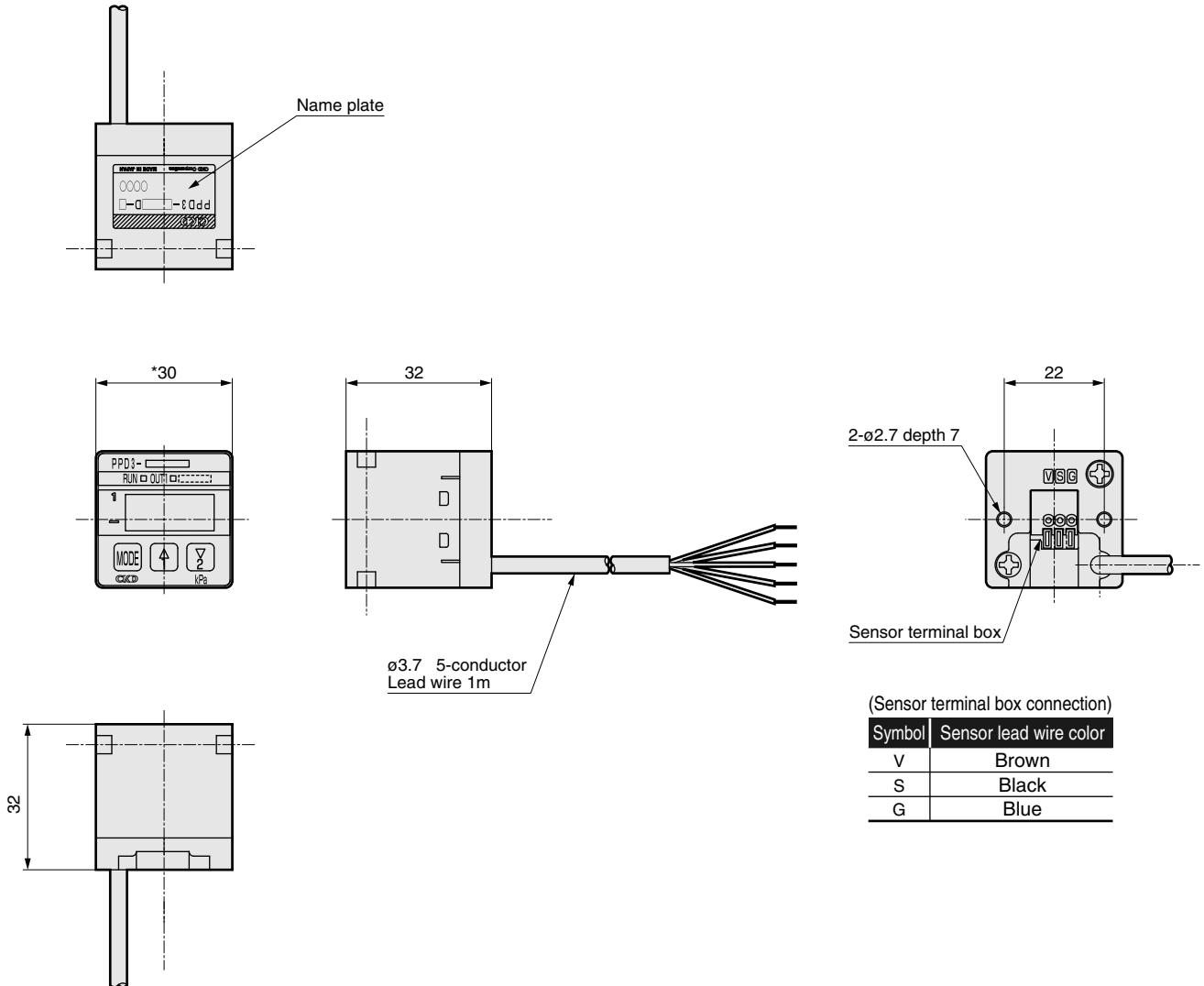
(Cautions)

- Analog output accuracy is affected by temperature and self-heating of power. Be sure to provide a standby time of 5 minutes or more after power is turned on when using.

Dimensions

Sensor separate type (display)

● PPD3-*****-D (display)



(Sensor terminal box connection)

Symbol	Sensor lead wire color
V	Brown
S	Black
G	Blue

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure switch
Pressure sensor

PPD3/PPD3-S Series

Internal structure and parts list

Sensor separate type (semiconductor sensor)

● PPD3-R**D-6

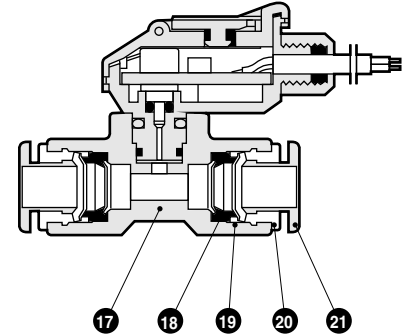
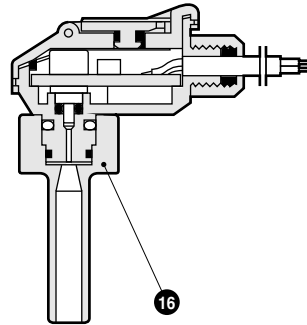
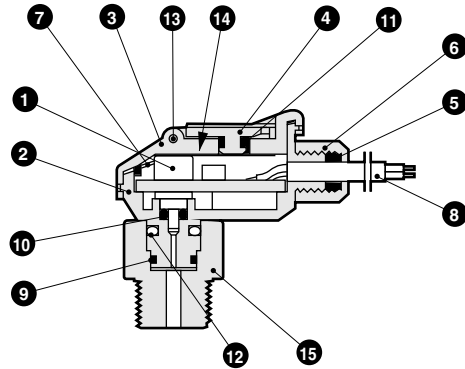
● PPD3-R**A-6 (discrete sensor model no.)

● PPD3-R**D-H6-B

● PPD3-R**A-H6-B (discrete sensor model no.)

● PPD3-R**D-H6

● PPD3-R**A-H6 (discrete sensor model no.)



No.	Parts name	Material	No.	Parts name	Material
1	Pressure sensor	Carrier diffusion type semiconductor strain gauge	12	Stopper	Stainless steel
2	Body	PBT (glass fiber 30%)	13	Spring pin	Stainless steel
3	Guard	Polycarbonate	14	Shield seat	Aluminum
4	Trimmer guard	Polycarbonate	15	R1/8	PBT (glass fiber 30%)
5	Bush	Nitrile rubber	16	Plug	PBT (glass fiber 30%)
6	Bush holder	Aluminum	17	Push-in joint	PBT
7	Guard gasket	Silicon rubber	18	Packing seal	Nitrile rubber
8	Lead wire (3m)	Polyvinyl chloride	19	Chuck	Brass (electroless nickeling)
9	O ring	Nitrile rubber	20	Outer ring	Brass (electroless nickeling)
10	O ring	Nitrile rubber	21	Push ring	Polyacetal
11	O ring	Nitrile rubber			

Dimensions

Sensor separate type (semiconductor sensor)

● PPD3-R**D-6

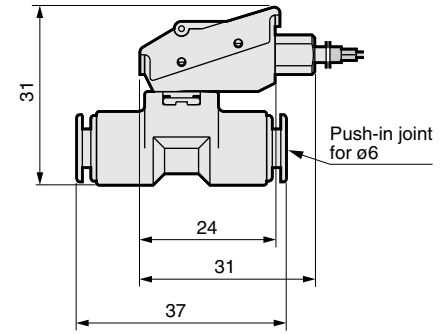
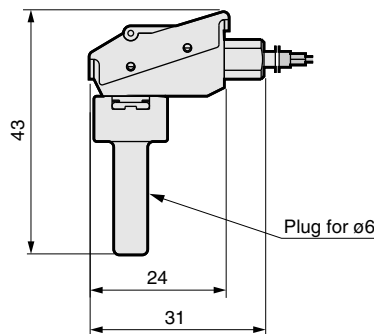
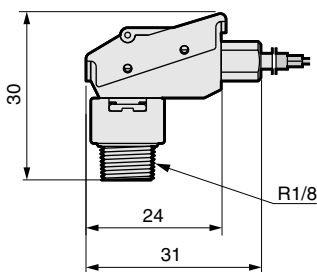
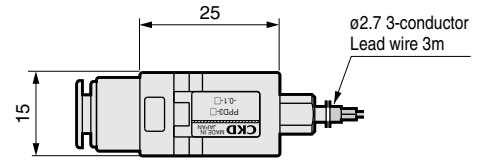
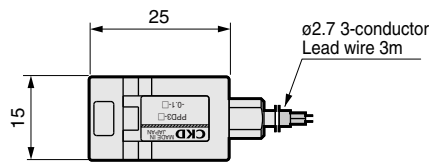
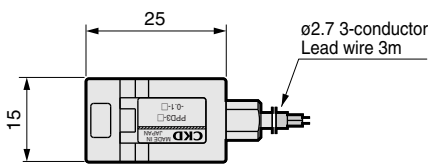
● PPD3-R**A-6 (discrete sensor model no.)

● PPD3-R**D-H6-B

● PPD3-R**A-H6-B (discrete sensor model no.)

● PPD3-R**D-H6

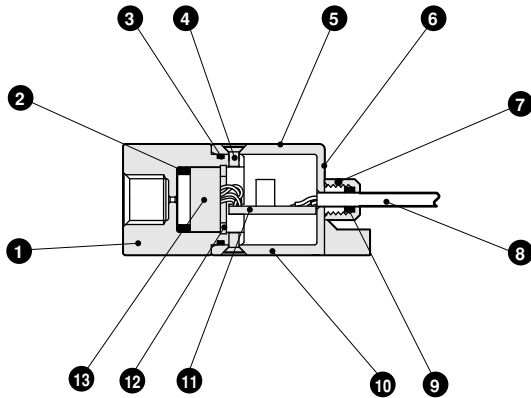
● PPD3-R**A-H6 (discrete sensor model no.)



Internal structure and parts list

Sensor separate type (stainless steel diaphragm sensor)

- PPD3-S-R**D-6B
- PPD3-S-R**A-6B (discrete sensor model no.)

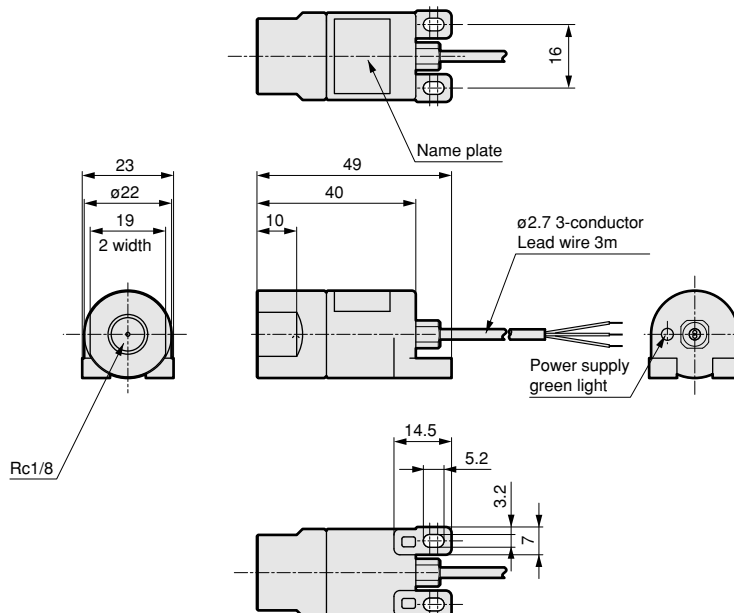


No.	Parts name	Material	No.	Parts name	Material
1	Pressure port	Aluminum	8	Lead wire (3m)	Polyvinyl chloride
2	O ring	Fluoro rubber	9	Bush	Nitrile rubber
3	O ring	Nitrile rubber	10	Sensor body	PBT (glass fiber 30%)
4	Flat screw	SUSXM7	11	Amplifier circuit board	Glass epoxy resin
5	Name plate	Polyester film	12	C ring for hole	Stainless steel
6	Light seat	Polyester film	13	Pressure sensor	Stainless steel diaphragm strain gauge
7	Bush holder	Aluminum			

Dimensions

Sensor separate type (stainless steel diaphragm sensor)

- PPD3-S-R**D-6B
- PPD3-S-R**A-6B (discrete sensor model no.)



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure switch
Pressure sensor

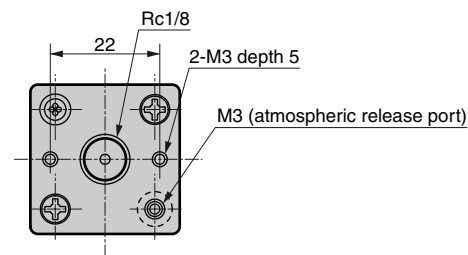
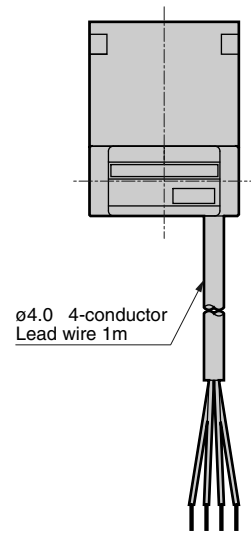
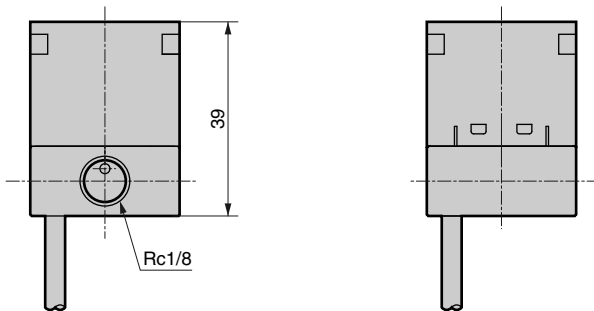
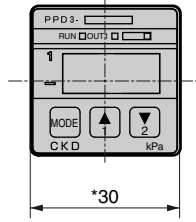
PPD3/PPD3-S Series



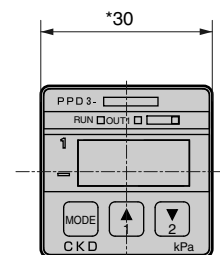
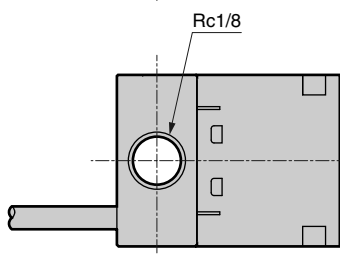
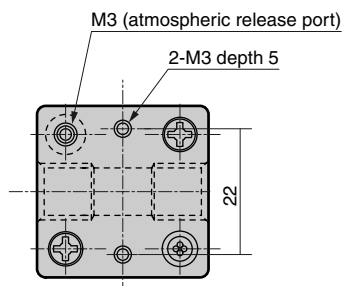
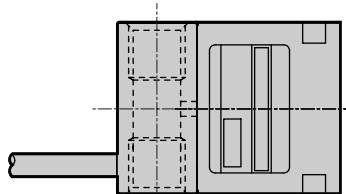
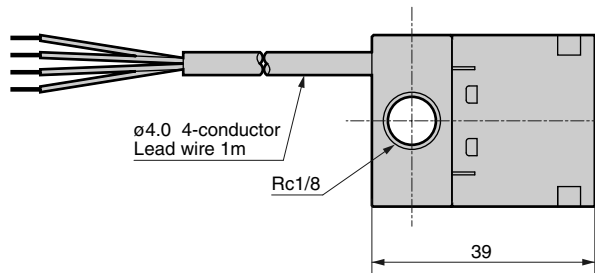
Dimensions: PPD3

Sensor integrated type (semiconductor sensor)

● PPD3-*****-6B



● PPD3-*****-6T



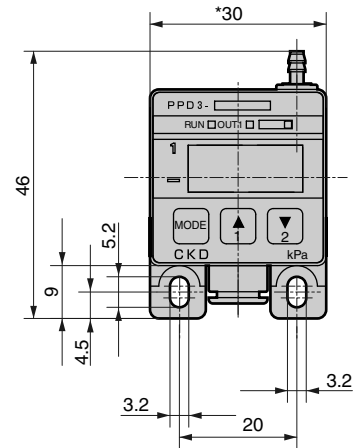
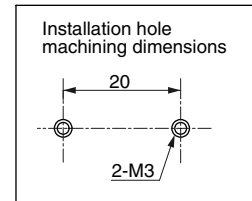
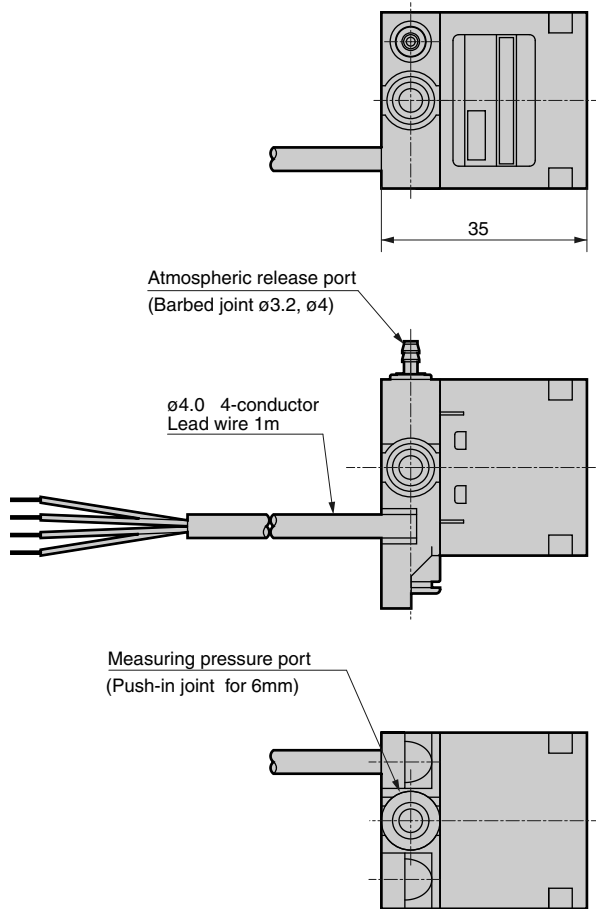
Refer to Safety precautions of PPD3 (-S) Series on pages 1085 to 1087 for wiring method and precautions.

Dimensions: PPD3

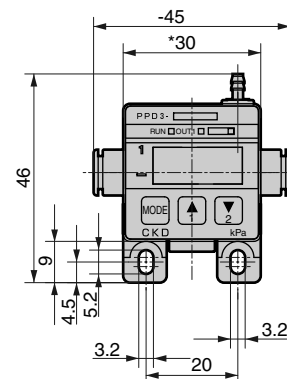
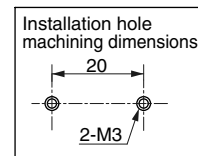
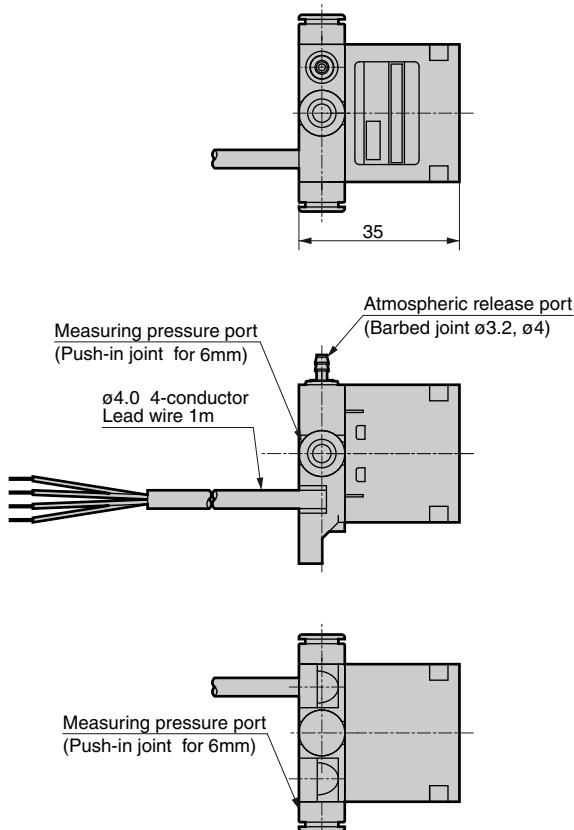


Sensor integrated type (semiconductor sensor)

● PPD3-****-6HD



● PPD3-****-6HT



Refer to Safety precautions of PPD3 (-S) Series on pages 1085 to 1087 for wiring method and precautions.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch
Pressure sensor

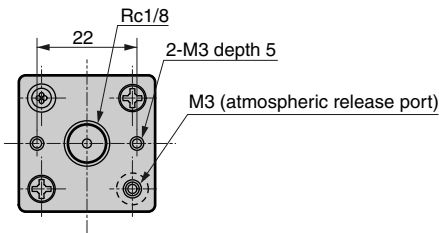
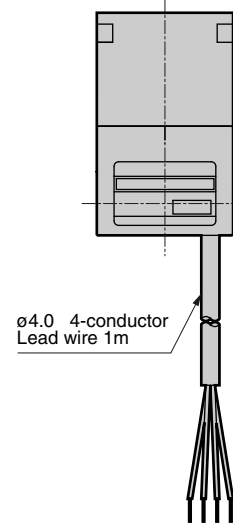
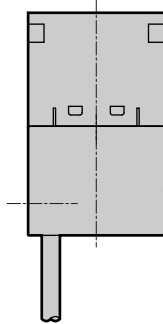
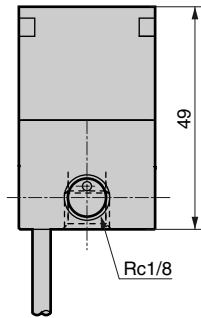
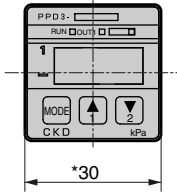
PPD3/PPD3-S Series



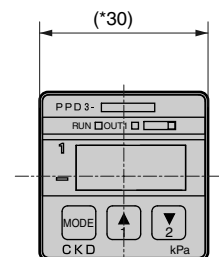
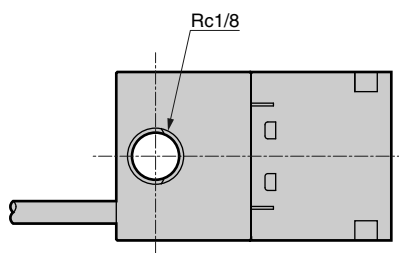
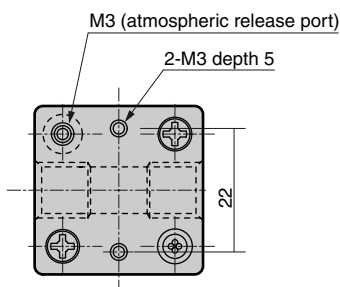
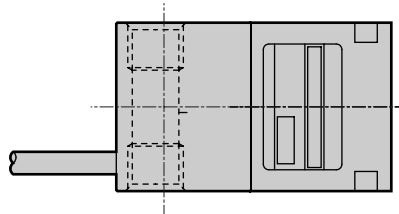
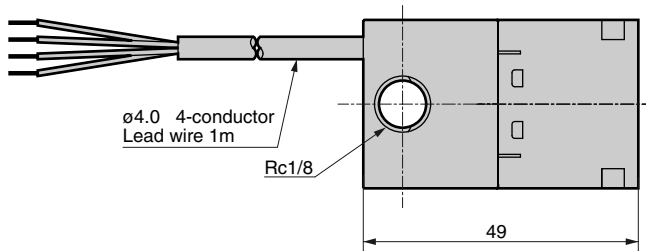
Dimensions: PPD3

Sensor integrated type (stainless steel diaphragm sensor)

● PPD3-S-*****-6B



● PPD3-S-*****-6T



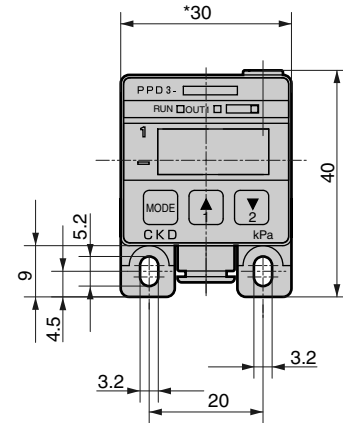
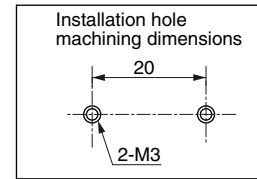
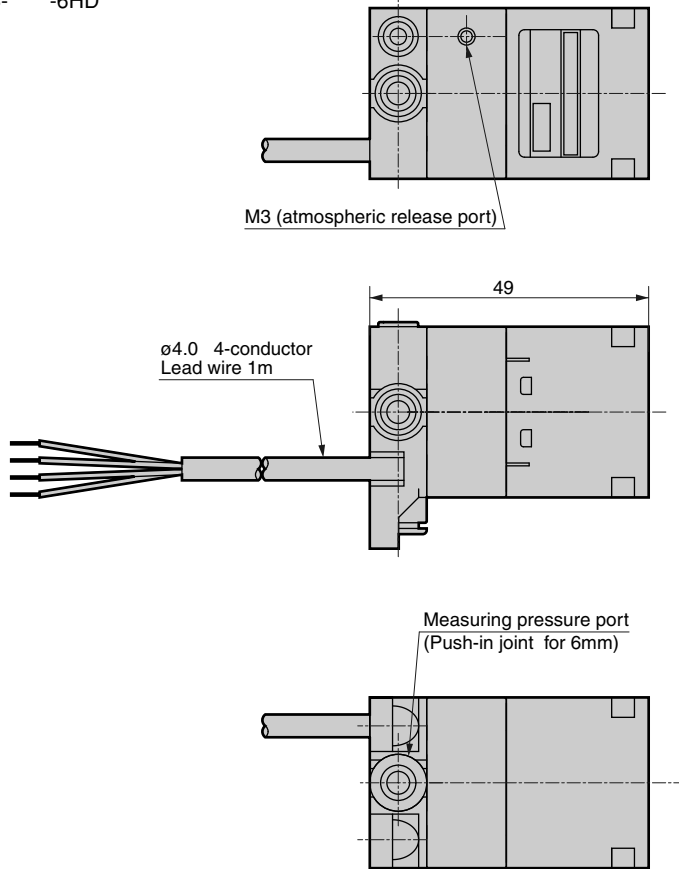
Refer to Safety precautions of PPD3 (-S) Series on pages 1085 to 1087 for wiring method and precautions.

Dimensions: PPD3

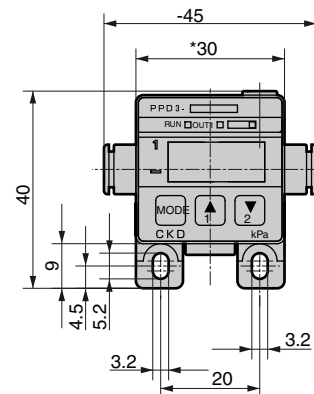
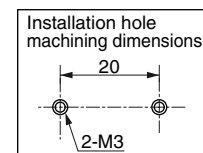
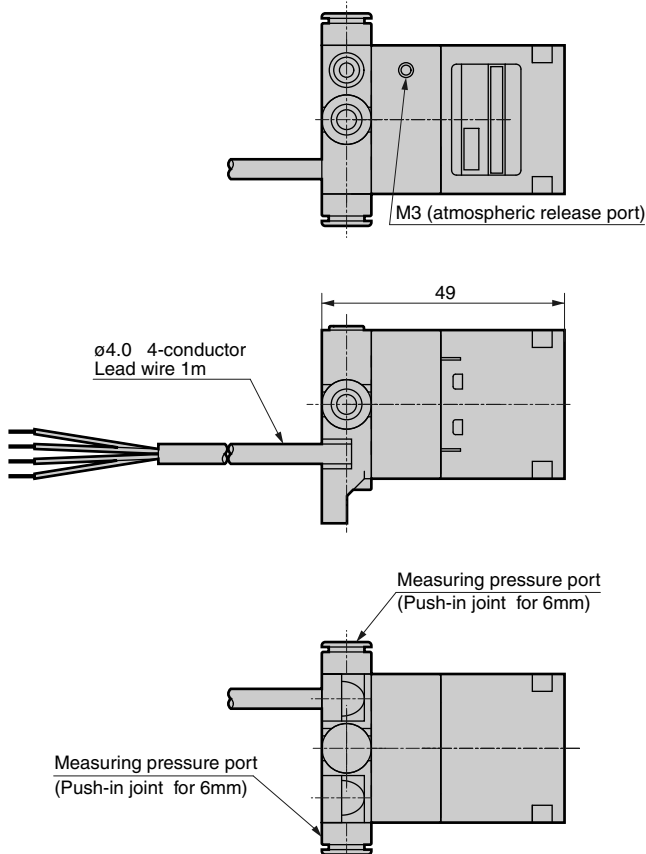


Sensor integrated type (stainless steel diaphragm sensor)

● PPD3-S-****-6HD



● PPD3-S-****-6HT



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

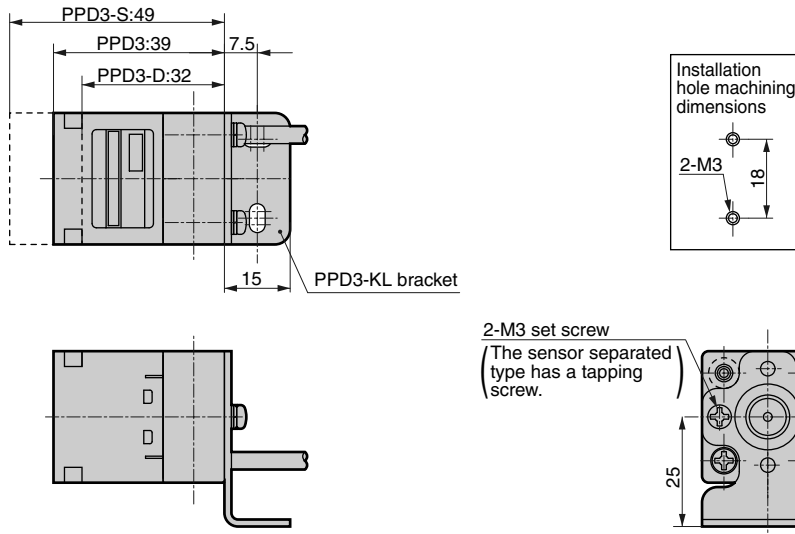
Electronic pressure switch
Pressure sensor

Refer to Safety precautions of PPD3 (-S) Series on pages 1085 to 1087 for wiring method and precautions.

PPD3/PPD3-S Series

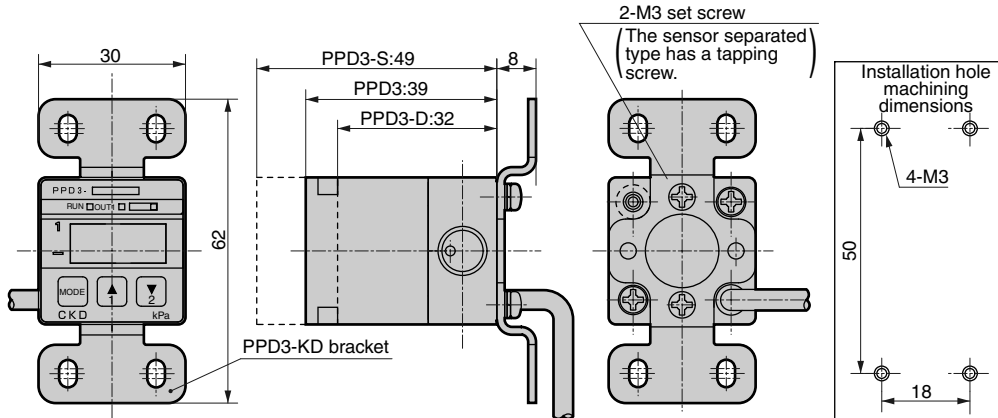
Dimensions: Bracket

● PPD3-KL (-D) assembly drawing



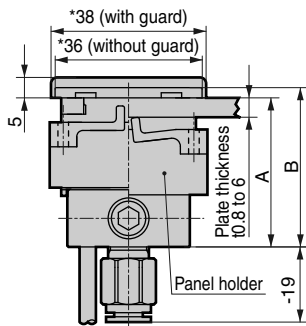
● PPD3-KD (-D) assembly drawing

Note: For this installation, use CKD miniature joint FTL4-M3 for atmospheric release port. (Only sensor integrated type)



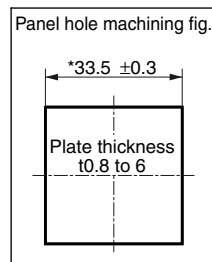
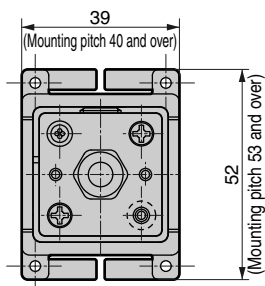
● PPD3-KHS (-D) assembly drawing Note: Push-in joint is not attached to PPD3-KHS-D.

Combinations with PPD3-R****-6B



Mounting dimensions depend on the model

Model	A	B
PPD3	36.5	39
PPD3-S	46.5	49
PPD3-D	29.5	32



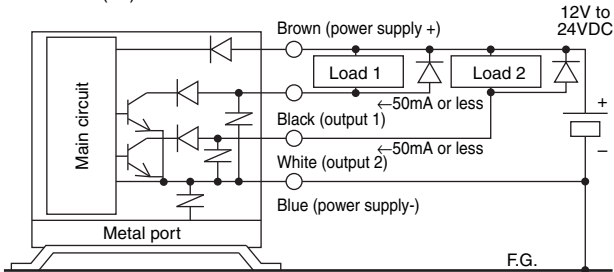
Refer to Safety precautions of PPD3 (-S) Series on pages 1085 to 1087 for wiring method and precautions.

Internal circuit / connection method

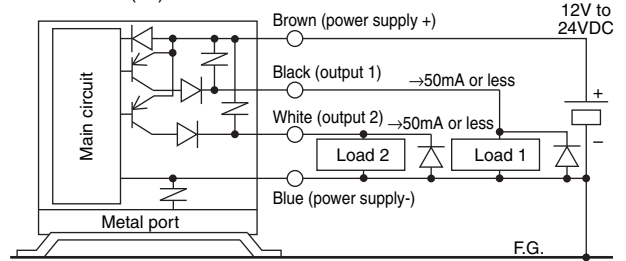
(Circuit and connection method)

PPD3 (-S) Series (sensor integrated type)

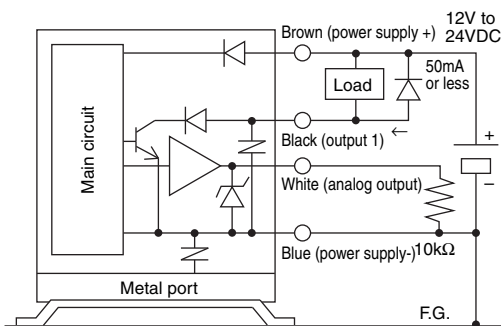
● PPD3(-S)-R**N



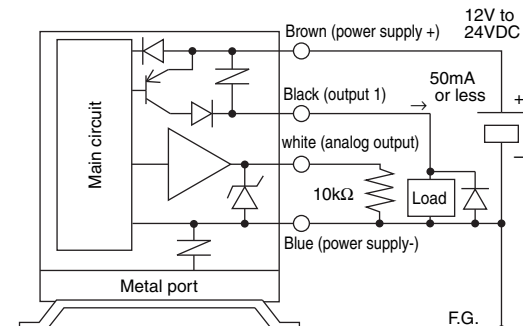
● PPD3(-S)-R**P



● PPD3(-S)-R**NA



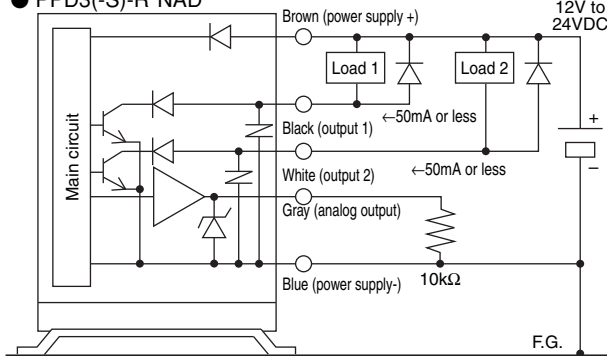
● PPD3(-S)-R**PA



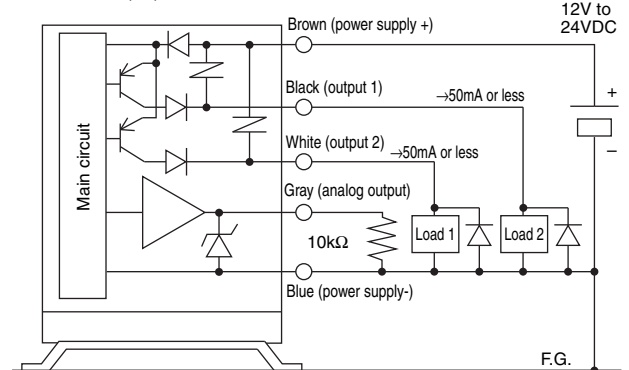
(Circuit and connection method)

PPD3 (-S)-D Series (sensor separated type)

● PPD3(-S)-R*NAD

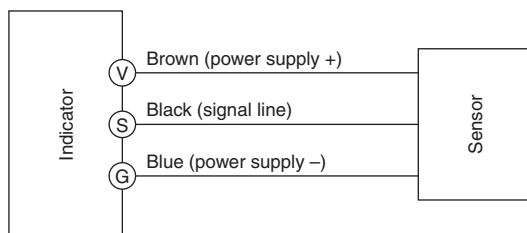


● PPD3(-S)-R*PAD

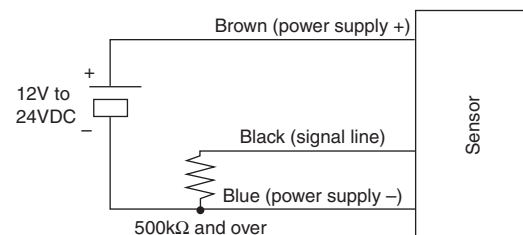


Sensor section connection method

● PPD3 (-S)-R*D



● Connection of discrete PPD3(-S)-R*A



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure switch
Pressure sensor

PPD3/PPD3-S Series

Display and operation section

Light state
 ○: Solid light
 ◐: Flash right

Overflow LED
 ○: Indicate value at 4th digit

RUN LED
 ○: Normal pressure display (turning off the light when setting)
 ◐: When using peak hold function

Switch output light (OUT1, OUT2)
 ○: When each switch output is ON
 ◐: Overcurrent protection is operating (There is no OUT2 when an analog output is provided)

Minus sign (-) LED
 ○: Indicate a minus value

MODE Key
 ● Press to enter each setting mode
 ● Press to advance setting mode
 ● Press to return to pressure display
 ● Press to cancel peak hold operation

3 digit LED
 ● Displays pressure, various switch setting, and machine status

MODE Key
 ● When pressure is displayed = sequentially displays CH1 data
 ● During peak hold operation = displays the minimum value
 ● When selecting a mode = sets the mode
 ● When setting data = decreases the value, etc.

Key 1
 ● When pressure is displayed = sequentially displays CH2 data
 ● During peak hold operation = displays the maximum value
 ● When selecting a mode = sets the mode
 ● When setting data = increases the value, etc.

Key 2
 ● When pressure is displayed = sequentially displays CH2 data
 ● During peak hold operation = displays the minimum value
 ● When selecting a mode = sets the mode
 ● When setting data = decreases the value, etc.

LED display

Numbers and alphabetic characters are displayed with a combination of LED displays.

Number	0	1	2	3	4	5	6	7	8	9
Indicator	0	1	2	3	4	5	6	7	8	9

Character	A	B (b)	C	D (d)	H	I (i)	J	L	N (n)	O (o)	P
Indicator	A	b	C	d	H	i	J	L	n	o	P

Rated pressure	980kPa	300kPa	100kPa
Model no.	R10	R03	R01
Pressure symbol	JO JO	LO LO	HO HO

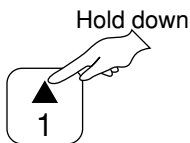
Model display



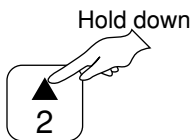
Output type	NPN output	PNP output
Model no.	N, NA	P, PA
Output type symbol	N n	P p

Set point confirmation method

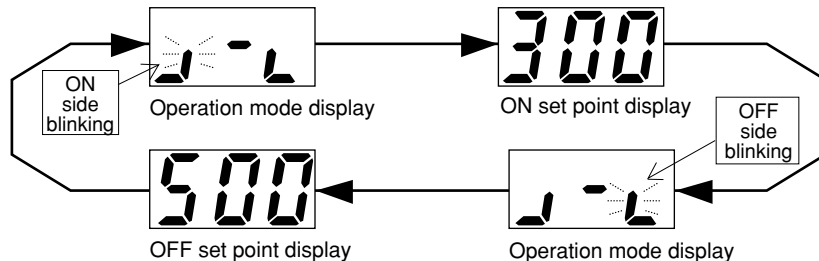
CH1 data display



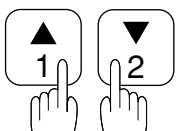
CH2 data display



When each key is pressed while pressure is displayed, the switch data ON set value, OFF set value, and operation waveform, zero adjustment value, pressure range, and output format can be displayed and confirmed. Switch operation is not affected during the following operations.

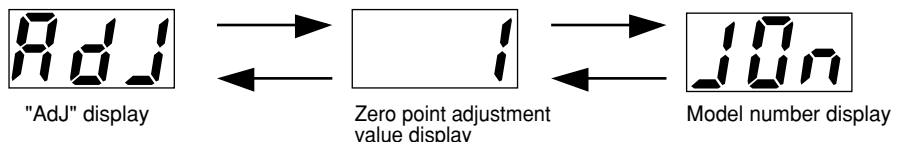


Zero point adjustment value, model number display



Press simultaneously

The zero point adjustment value and model no. are displayed alternately. Switch operation is not affected even during operation.



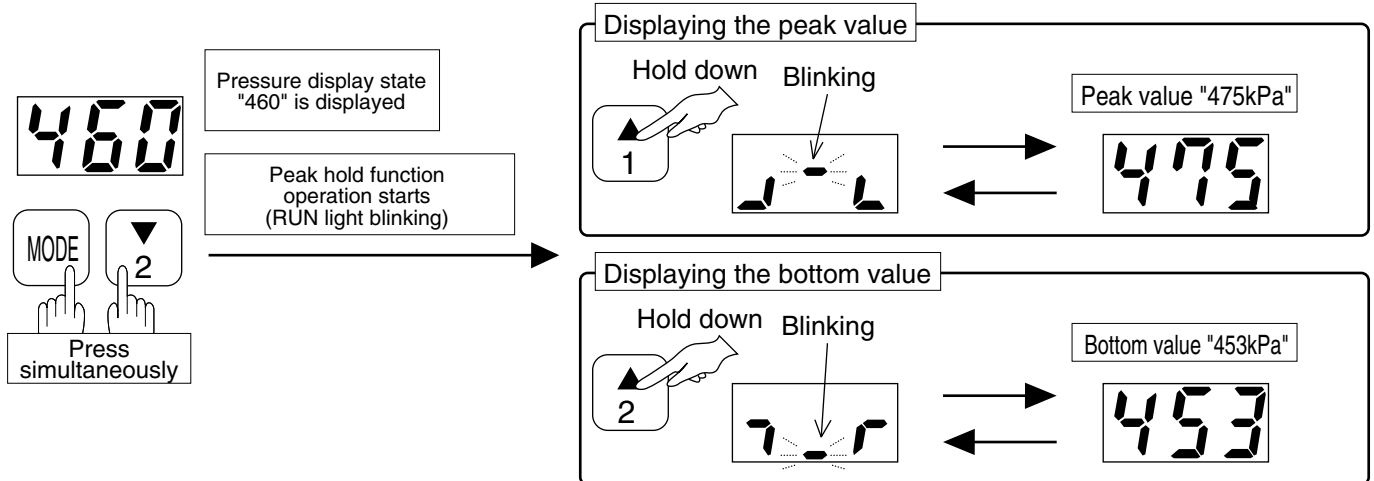
Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch
Pressure sensor

How to operate each function

Peak hold

The pressure value for a set period is displayed to see the maximum and minimum values. Use this to check the stability of main pressure and supply pressure etc. The peak hold operation does not affect this product's basic functions such as switch operations or pressure display. The peak hold operation does not affect this product's basic functions such as switch operations or pressure display.



Switch output function

Refer to following page for operation method. →

The PPD3 (-S) has a 2-point or 1-point switch output, and operates in 4 operation modes and stopping operation. The switch function is started by setting the required operation mode (refer to the switch operation mode on page 1139) and by setting 2 set values (ON set value and OFF set value) which specify operation pressure. Determine the operation mode to be used, and the ON set value and OFF set value before making settings. Select and set the following data to operate the switch:

CH1: Operation mode

CH1: ON set point

CH1: OFF set point

CH2: Operation mode

CH2: ON set point

CH2: OFF set point

(CH2 is not used with analog output. Nothing is be output even if set.)

Switch output test

Refer to following page for operation method. →

Use this function to forcibly turn the switch output ON and confirm the wiring connection of initial operation of the input unit.

Note 1: Use this test function to check the wiring connection and the input unit's operation. Avoid using this function instead of actual signals when executing the sequence program while the machine or device is operating. (Refer to CAUTIONs in "During use & Maintenance" from page 1074)

Zero point adjustment function

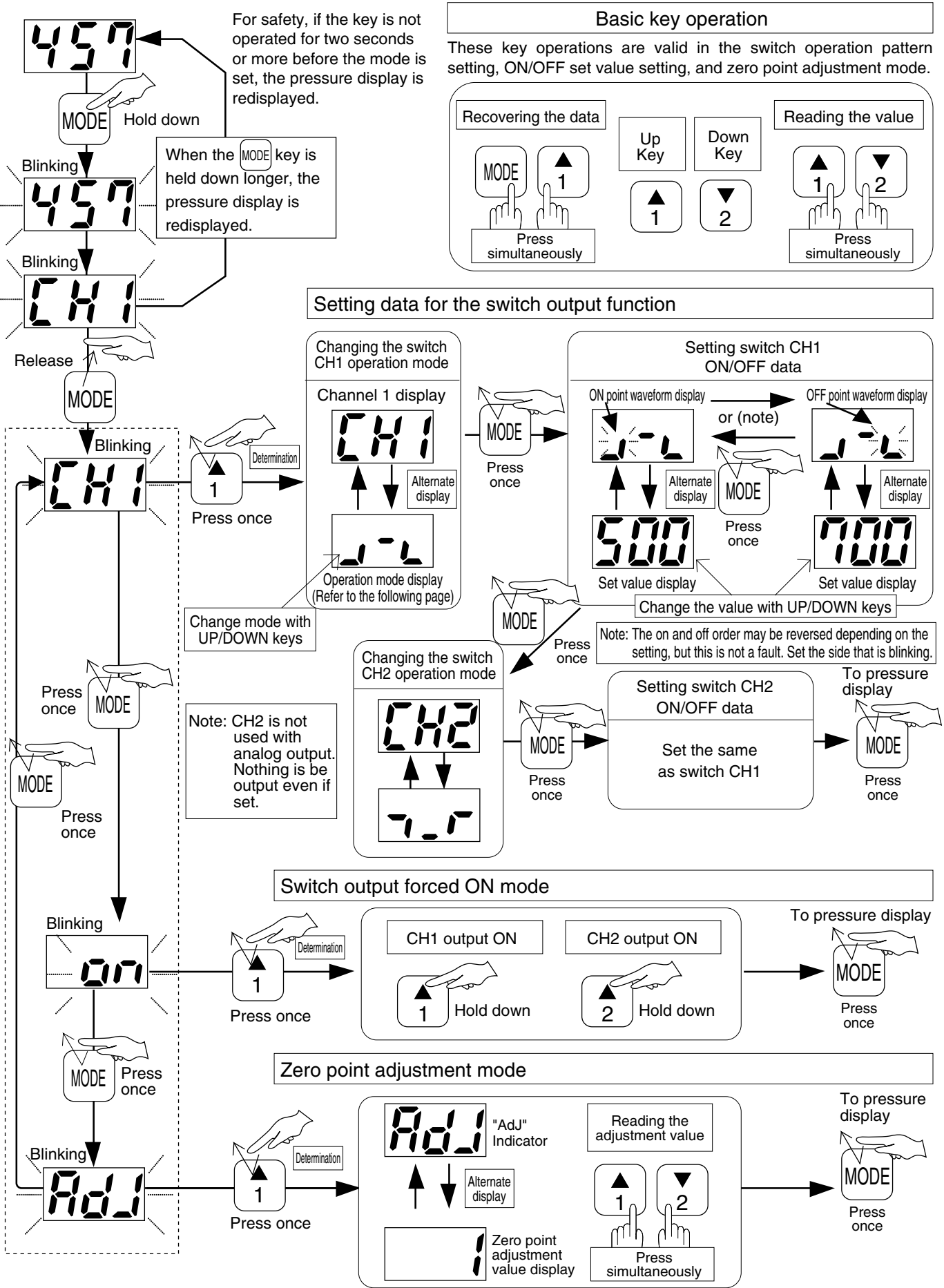
Refer to following page for operation method. →

Deviation of the display from the zero point is compensated in the atmospheric pressure pressurized state.

Note 2. The above settings and test greatly affect the output signal and display value. Stop the machine and devices using this product, and confirm that safety is ensured even if malfunction or an incorrect display occurs before operating. Using this function while the machine or device is operating could result in unforeseen malfunction or incorrect displays.

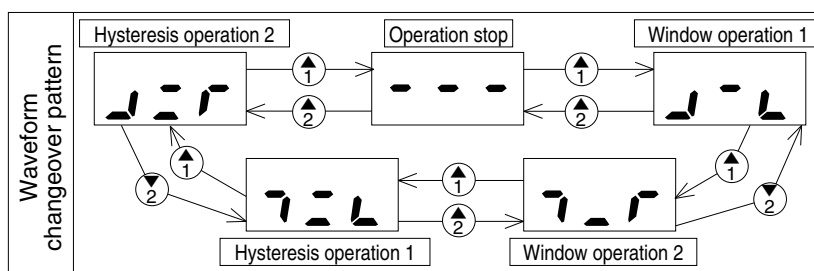
Note 3. As a measure to avoid malfunctions, all keys must be held down for a set time to select the mode.

Operation chart for switch output function, forced output function, zero point adjustment function



Switch operation mode

Operation mode name	Operation waveform	LED operation waveform display	Applications
1 Window operation 1 (ON when within range)			When used to confirm main pressure, the ON signal is output as the normal signal if main pressure is within the appropriate range.
2 Window operation 2 (ON when outside range)			When used to confirm main pressure, the ON signal will be output as the error signal if main pressure is abnormal.
3 Hysteresis operation 1 (ON at low pressure)			When used to confirm suction, the ON signal will be output if suction pressure for picking up the workpiece has sufficiently dropped.
4 Hysteresis operation 2 (ON at high pressure)			When used to confirm contact, the ON signal is output if the workpiece is held and pressure has sufficiently increased.
5 Operation stop			When not using the switch output, stop operation to prevent damage and accidents.



- Note 1. When using for a winding operation, provide an interval of 3%F.S. and over between the 2 set values. A 1%F.S. hysteresis is automatically added to the ON side and OFF side.
- Note 2. When using for a hysteresis operation, provide an interval of 1%F.S. and over between the 2 set values. If there is no difference between the two settings, operation may not take place or may be unstable.
- Note 3. The left side of the operation waveform indicates negative pressure, and the right side indicates positive pressure.
- Note 4. The magnitude relation of the ON set value and OFF set value is determined when the operation mode is determined, and a reverse magnitude relation cannot be attained. With this product, however, operation of the designated operation pattern is the priority. When two settings are input, the magnitude relationship is automatically determined, and each is judged and processed as appropriate ON and OFF settings. Even if ON and OFF settings are input in reverse, input is recognized as the correct ON and OFF settings and will be processed separately.

Refrigerating type dryer
 Desiccant type dryer
 High polymer membrane type dryer
 Air filter
 Auto. drain / others
 F.R.L. (Module unit)
 F.R.L. (Separate)
 Compact F.R.
 Precise regulator
 F.R.L. (Related products)
 Clean F.R.
 Electro pneumatic regulator
 Air booster
 Speed control valve
 Silencer
 Check valve / others
 Joint / tube
 Vacuum filter
 Vacuum regulator
 Suction plate
 Magnetic spring buffer
 Mechanical pressure SW
 Electronic pressure SW
 Contact / close contact cont. SW
 Air sensor
 Pressure SW for coolant
 Small flow sensor
 Small flow controller
 Flow sensor for air
 Flow sensor for water
 Total air system
 Total air system (Gamma)

Ending

Electronic pressure switch
 Pressure sensor



Electronic pressure switch

PPD Series

Miniature pressure switch 28mm square x 30mm
Upgraded.



Refer to Intro 32 for details.



Overview

Pressure switch PPD Series is upgraded miniature digital display pressure switch for pneumatic and vacuum systems compared with conventional products. Newly, ISO unit display is provided as standard to shift measurement unit smoothly. Due to EEPROM data-hold, maintenance of battery is eliminated. Replacement from old type is also easy, meeting high accuracy requirement and international needs.

Features

- Two types of switch operation
2 types of a window and hysteresis operations are available to match size of set value.
- When installing in inside of machine, easily confirmed by LED display
Easy to read LED display when installed at dark place under machine or inside.
- Wide pressure range
- Compatible with CKD regulator
Compatible with analog pressure gauge port of CKD regulator
R1000/R3000/R4000/R8000 filter regulator
W1000/W3000/W4000/W8000
- 5 types of installation attitude
Five mounting types enable a variety of mounting methods.
- 0 adjust function
Simple zero set of display
- Switch operating pressure can be set easily
Easy and certain operation by up-down key.
- EEPROM data-hold
Eliminating anxiety for charging time of battery and maintenance.
- Overcurrent protection from circuit provided to switch output
- Output element protection from accident by short circuit of load.

Specifications

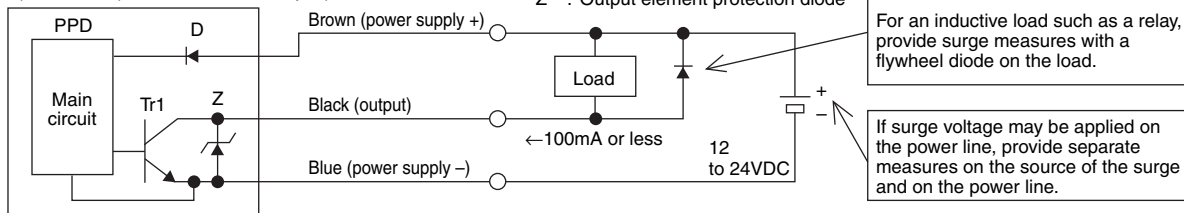
Descriptions	PPD-P10PKN/P	PPD-P01AKN/P	PPD-V01AHN/P
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor		
Working fluid	Air, Non-corrosive gas		
Type of pressure	Gauge pressure		
Rated pressure range	0 to 0.98MPa	0 to 98kPa	0 to -100kPa
Min. display digit	0.01MPa	1kPa	
Withstanding pressure	1.47MPa	196kPa	196kPa
Leakage amount	1cm ³ /min (ANR) or less		
Indicator	2 1/2 digit red LED display character height 8mm		
Repeatability	1%F.S. or less		
Display precision	±2%F.S. (25°C)		
Temperature characteristics	±4%F.S. (0 to 50°C)		
Power voltage	12 to 24 VDC±10% (ripple ratio 1% or less)		
Current consumption	50mA or less		
Output responsiveness	Approx. 5msec		
Output type	N: NPN transistor open collector output 1 point P: PNP transistor open collector output 1 point		
Output rated	NPN: MAX 30 VDC 100mA PNP: MAX 26.4 VDC 50mA (Note 1)		
Voltage drop	NPN: 1.2V or less/PNP: 2.4V or less (Note 1)		
Set point holding	EEPROM		
Lead wire	oil resistance vinyl code 3-conductor (0.2mm ² isolator outer diameter ø1.1) 1m		
Working temperature	0 to 50°C		
Use humidity	0 to 85%RH (no dew condensation)		
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm 2 hours per X, Y, Z direction		
Protective structure	IP40 or equivalent		
Weight	6B: 65g, 6P: 75g, 6M: 65g, 6D: 80g, 1F: 45g, HS: 95g		

Note 1: Note that the output rating and voltage drop values are different for NPN and PNP.

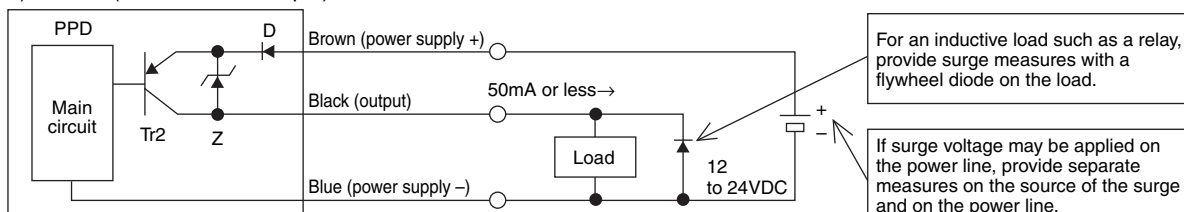
Note 2: CE-compatible parts are available as custom orders. Contact CKD for details.

<Internal circuit and connection method>

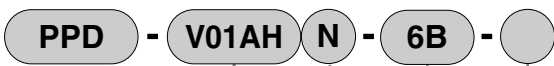
1) PPD-*N (NPN transistor output)



2) PPD-*P (PNP transistor output)



How to order



A Pressure range and unit

B Output type

C Installation attitude

D Option

Symbol	Descriptions	
A Pressure range and unit		
P10PK	0 to 0.98MPa	
P01AK	0 to 98kPa	
V01AH	0 to -100kPa	
B Output type		
N	NPN open collector output 1 point	
P	PNP open collector output 1 point	
C Installation attitude		
6B	Rear side Rc1/8, with bracket	
6P	Panel mount Rear side Rc1/8, with screw	
6M	Rear side R1/8	
6D	Bottom Rc1/8	
1F	Direct mount O ring / with screw	
HS	Panel mount installation With push-in joint 6mm	
D Option		Note 1
Blank	M3 screw for mounting 2 pcs. attached	
1	R1000/R1100 W1000/W1100 2 tapping screws for mounting attached	
2	R2000/R2100/R3000/R4000/ R6000/R8000/R3100/R4100/ R6100/R8100/W3000/W4000/ W8000/W3100/W4100/W8100 2 tapping screws for mounting attached	

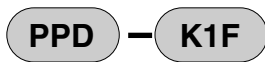
<Example of model number>

PPD-V01AHN-6B

Indicates bracket mounted type with pressure range 0 to -100kPA, NPN transistor output type output, rear pressure port Rc1/8, and a bracket is provided.

Note 1: Select an option only when installation attitude is 1F.

PPD option kit model no.



A Option kit

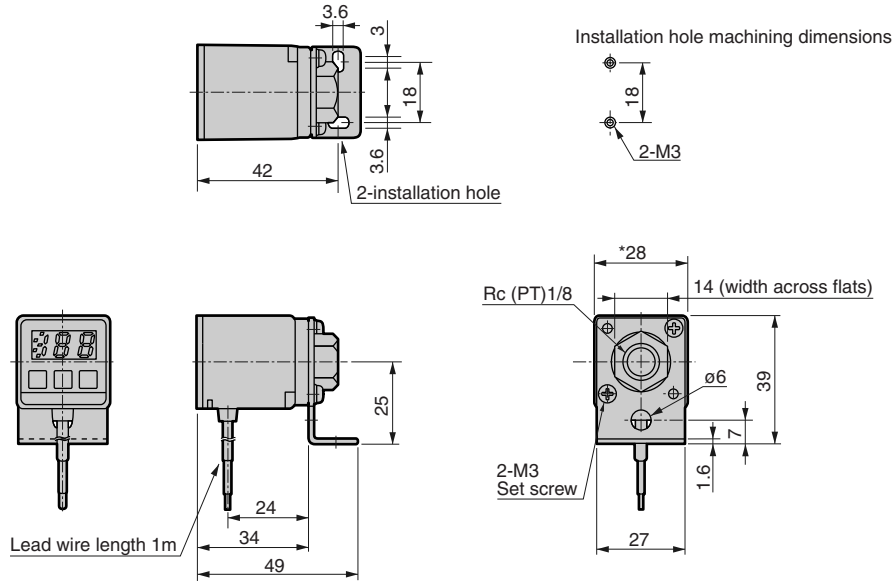
Symbol	Descriptions	
A Option kit		
K1F	Key (2 pcs.)	1F (Repair parts for position / direction change)
	O ring	
	Installation screw (2 pcs.)	
K1F-1	Key (2 pcs.)	1F-1 (Repair parts for position / direction change)
	O ring	
	Installation screw (2 pcs.)	
K1F-2	Key (2 pcs.)	1F-2 (Repair parts for position / direction change)
	O ring	
	Installation screw (2 pcs.)	

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending
Electronic pressure switch
Pressure sensor

Dimensions

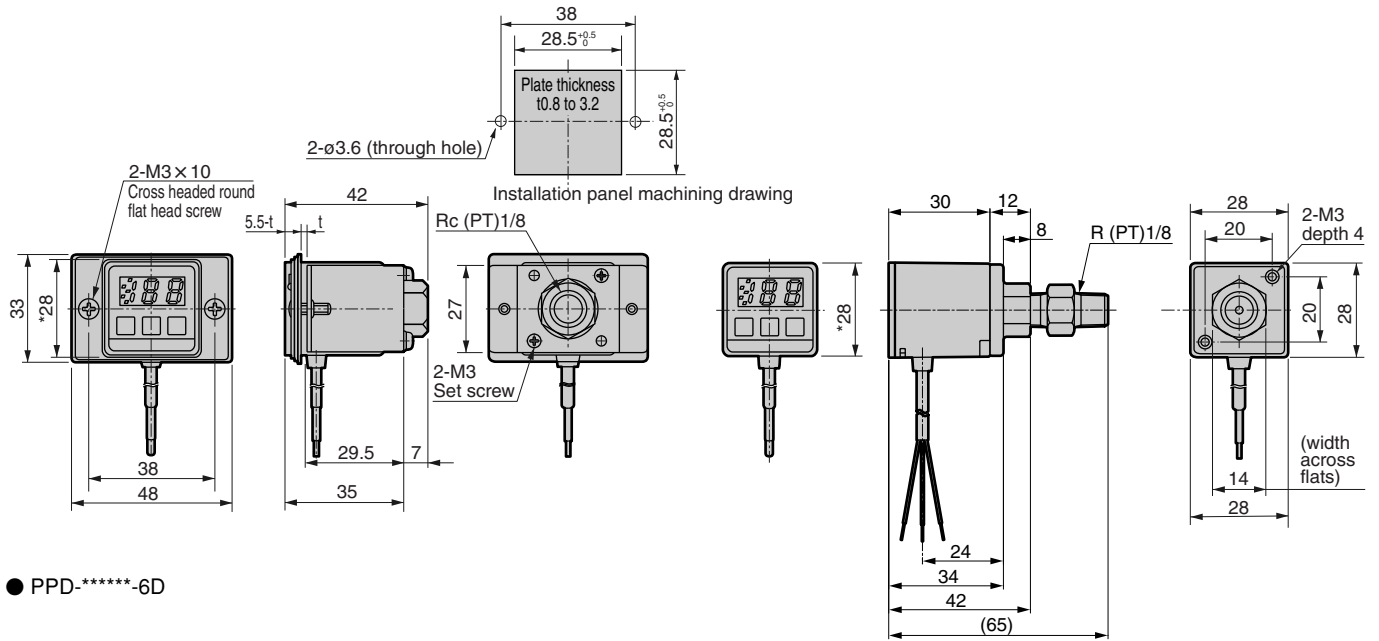
Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

● PPD-*****-6B

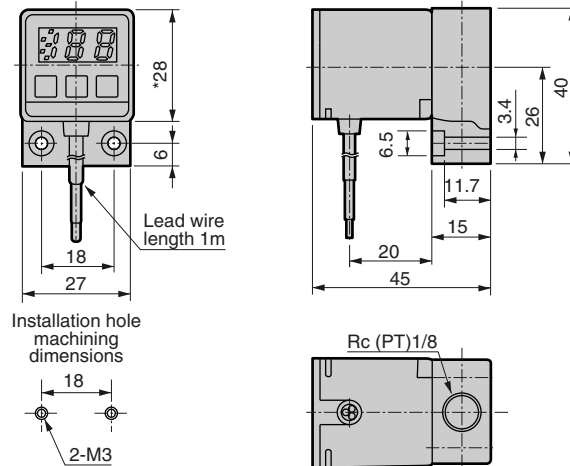


● PPD-*****-6P

● PPD-*****-6M



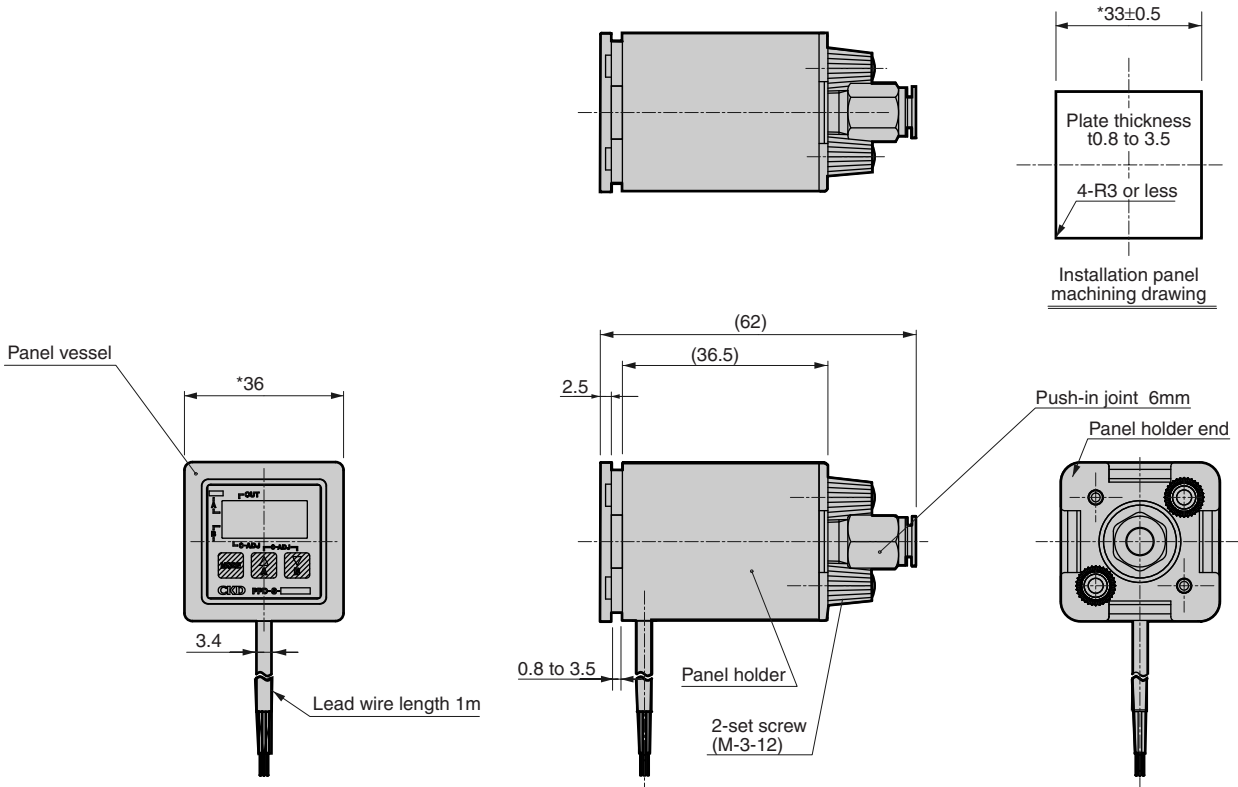
● PPD-*****-6D



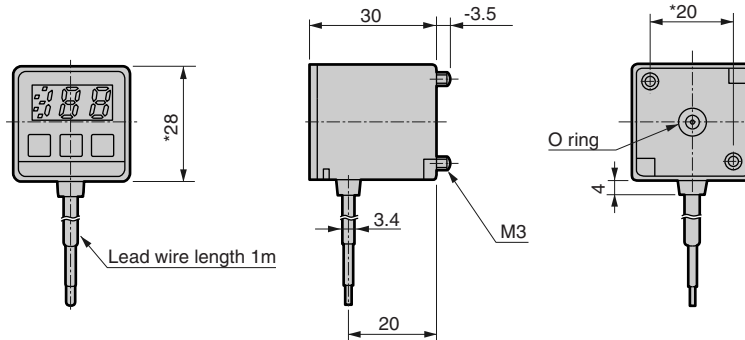
Refer to Safety precautions of PPD Series on pages 1085 to 1087 for wiring method and precautions.

Dimensions

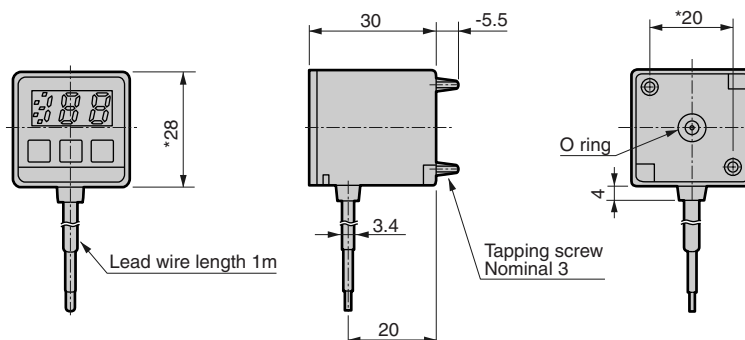
● PPD-**-HS



● PPD-**-1F



● PPD-**-1F-1/-1F-2



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

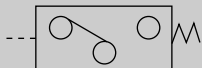
Ending

Electronic pressure switch
Pressure sensor

⚠ Refer to Safety precautions PPD Series on pages 1085 to 1087 for details.

PPD-S Series

Suction confirmation of wet workpiece
Can be used with drain containing plant air



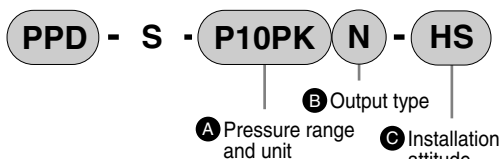
Refer to Intro 32 for details.



Features

- Stainless steel diaphragm sensor is used for sensor section
- This can be used with drain containing plant air.
- For vacuum, withstanding pressure is 3-fold reinforced. This can be used for positive / air blow.

How to order



Symbol	Descriptions
A Pressure range and unit	
P10PK	0 to 0.98MPa
P01AK	0 to 98kPa
V01AH	0 to -100kPa
B Output type	
N	NPN open collector output 1 point
P	PNP open collector output 1 point
C Installation attitude	
6B	Rear side Rc1/8, with bracket
HS	Panel mount installation With push-in joint 6mm

Specifications

Descriptions	PPD-S-P10PKN/P	PPD-S-P01AKN/P	PPD-S-V01AHN/P
Pressure sensitive element	Stainless steel diaphragm pressure sensor		
Working fluid	Air, compressed air (including water, oil content, drain), non-corrosive gas		
Type of pressure	Gauge pressure		
Rated pressure range	0 to 0.98MPa	0 to 98kPa	0 to -100kPa
Min. display digit	0.01MPa	1kPa	
Withstanding pressure	1.47MPa	588kPa	588kPa
Leakage amount	1cm ³ /min. (ANR) or less		
Indicator	2 1/2 digit red LED display character height 8mm		
Display precision (25°C)	±2%F.S.	±3%F.S.	
Temperature characteristics (0 to 50°C)	±4%F.S.	±5%F.S.	
Power voltage	12 to 24 VDC±10% (ripple ratio 1% or less)		
Current consumption	50mA or less		
Output responsiveness	Approx. 5msec		
Output type	N: NPN transistor open collector output 1 point P: PNP transistor open collector output 1 point		
Output rated	NPN: MAX 30 VDC 100mA PNP: MAX 26.4 VDC 50mA (Note 1)		
Voltage drop	NPN: 1.2V or less/PNP: 2.4V or less (Note 1)		
Set point holding	EEPROM		
Lead wire	Oil resistance vinyl code 3-conductor (0.2mm ² isolator outer diameter ø1.1) 1m		
Working temperature	0 to 50°C		
Use humidity	0 to 85% (no dew condensation)		
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm 2 hour per X, Y, Z direction		
Protective structure	IP40 or equivalent		

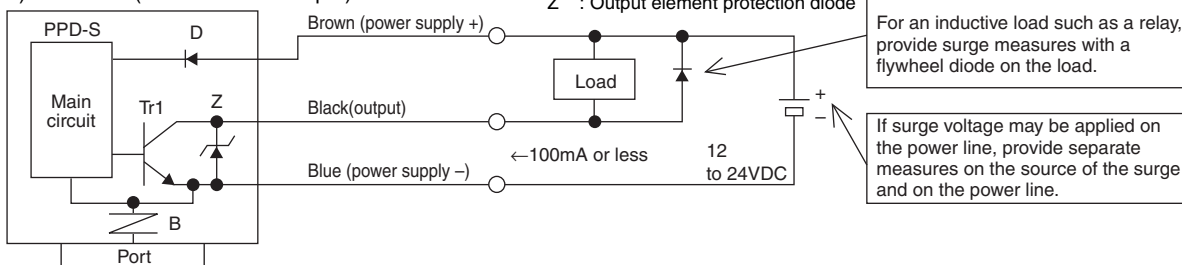
Note 1: Note that the output rating and voltage drop values are different for NPN and PNP.
Note 2: CE-compatible parts are available as custom orders. Contact CKD for details.

<Example of model number>

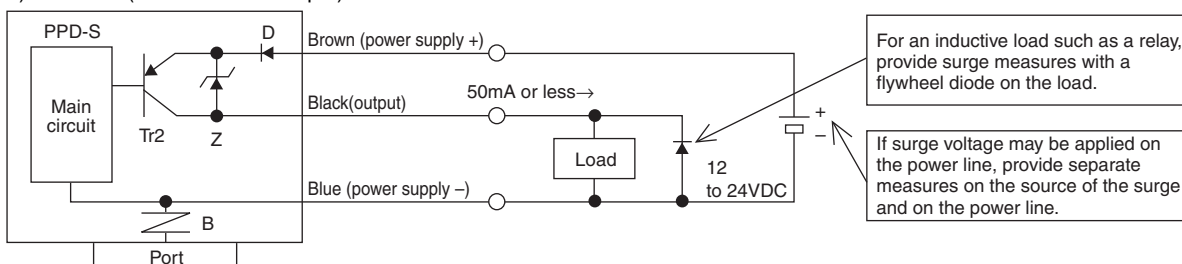
PPD-S-P10PKN-HS Indicates panel mounted type with pressure range 0 to 0.98MPa, NPN transistor output type output, and panel mount installation.

<Internal circuit and connection method>

1) PPD-S-*N (NPN transistor output)

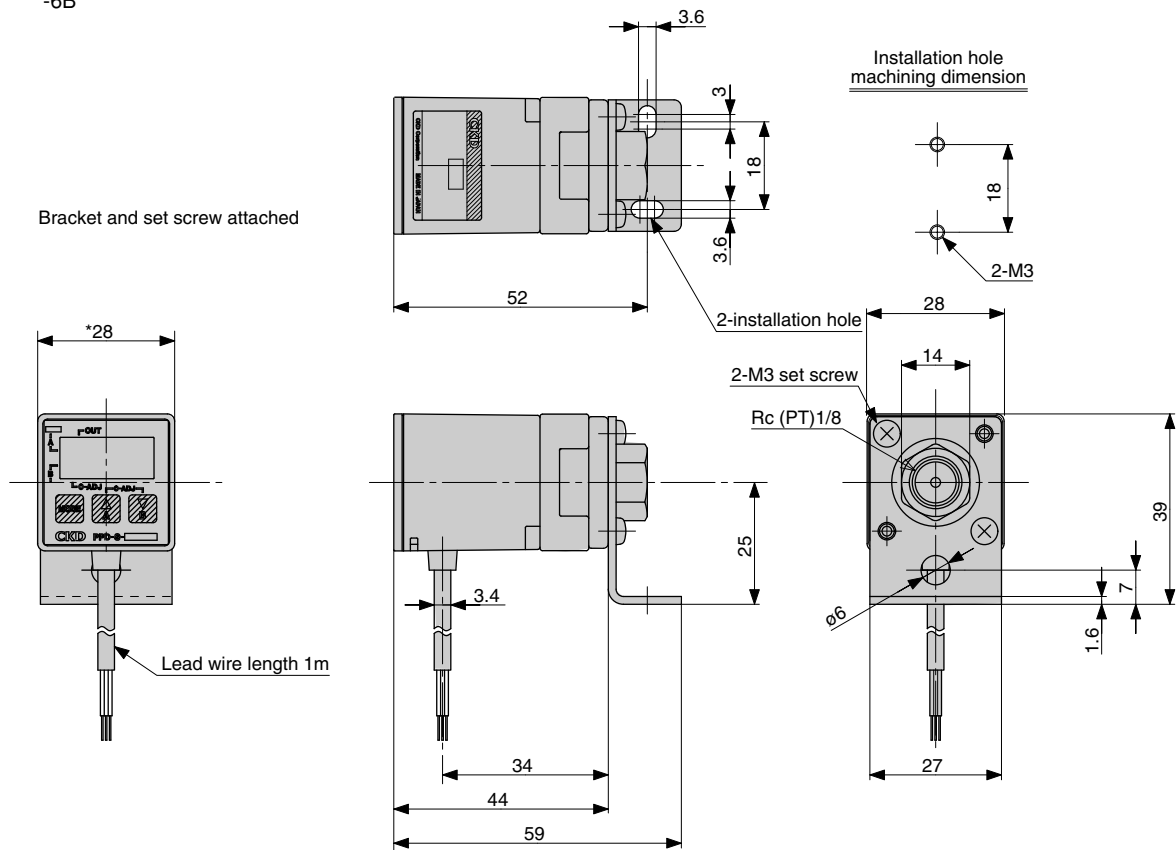


2) PPD-S-*P (PNP transistor output)

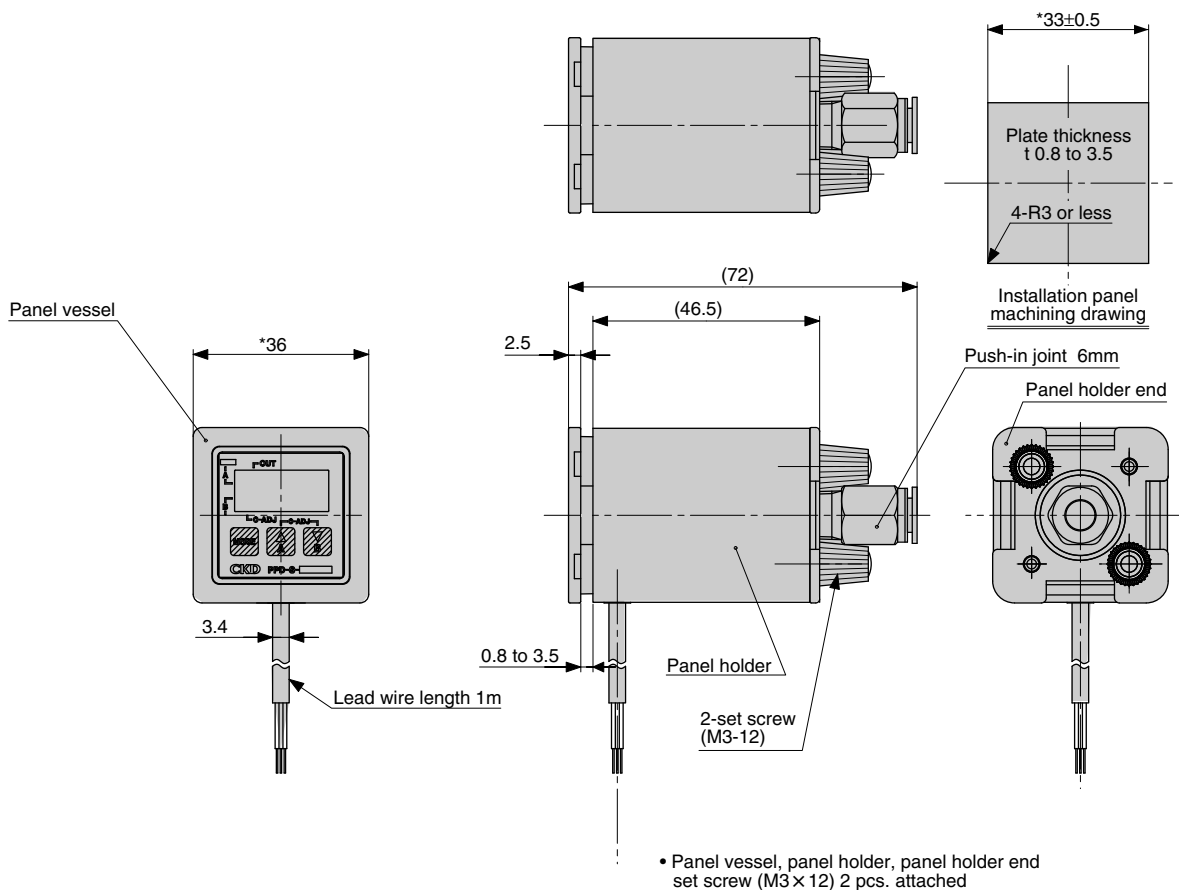


Dimensions

● PPD-S-*****-6B



● PPD-S-*****-HS



Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

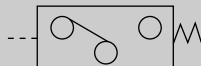
Electronic pressure switch
Pressure sensor

⚠ Refer to Safety precautions PPD Series on pages 1085 to 1087 for details.

Electronic pressure switch with protection BOX

PPD-A Series

Reinforced strength equivalent to protective structure IP67
Can be operated by a wet hand



Features

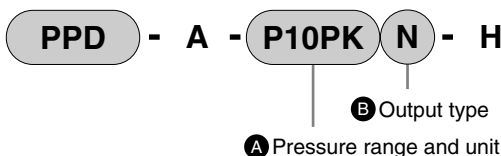
- Equivalent to protective structure IP67
- Protective functions ensured full-time
Settings possible even when wet
No need to open case
- With push-in joint
Light weight due to resin case and push-in joint

Specifications

Descriptions	PPD-A-P10PKN/P-H	PPD-A-P01AKN/P-H	PPD-A-V01AHN/P-H
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor		
Working fluid	Air, Non-corrosive gas		
Type of pressure	Gauge pressure		
Rated pressure range	0 to 0.98MPa	0 to 98kPa	0 to -100kPa
Min. display digit	0.01MPa	1kPa	
Withstanding pressure	1.47MPa	196kPa	196kPa
Leakage amount	1cm ³ /min. (ANR) or less		
Indicator	2 1/2 digit red LED display character height 8mm		
Display precision	±2%F.S.(25°C)		
Temperature characteristics	±4%F.S.(0 to 50°C)		
Power voltage	12 to 24 VDC±10% (ripple ratio 1% or less)		
Current consumption	50mA or less		
Output responsiveness	Approx. 5msec		
Output type	N: NPN transistor open collector output 1 point P: PNP transistor open collector output 1 point		
Output rated	NPN: MAX 30 VDC 100mA PNP: MAX 26.4 VDC 50mA (Note 1)		
Voltage drop	NPN: 1.2V or less/PNP: 2.4V or less (Note 1)		
Set point holding	EEPROM		
Lead wire	Oil resistance vinyl code 3-conductor (0.2mm ² isolator outer diameter ø1.1) 1m		
Working temperature	0 to 50°C		
Use humidity	0 to 85%RH (no dew condensation)		
Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm, 2 hour per X, Y, Z direction		
Protective structure	IP67 or equivalent		
Weight	120g		
Port	Push-in joint (applicable tube appearance 6mm) Recommended tube: F-1506,U-9506		
Atmospheric release port	Barbed joint Recommended tube: FH-3224,U-9532,U-9504		

Note 1: Note that the output rating and voltage drop values are different for NPN and PNP.

How to order

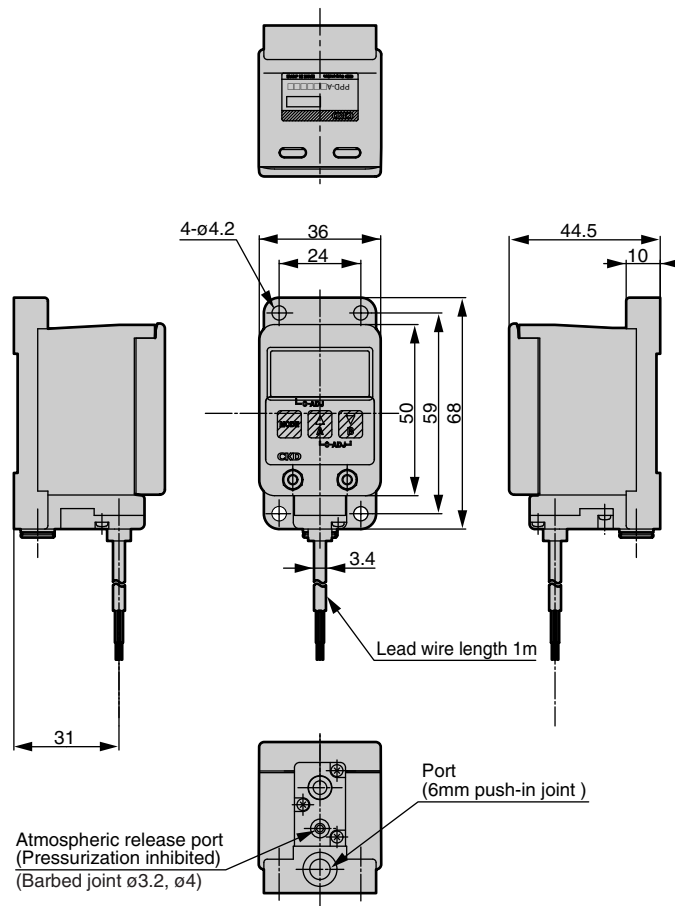


Symbol	Descriptions
Ⓐ Pressure range and unit	
P10PK	0 to 0.98MPa
P01AK	0 to 98kPa
V01AH	0 to -100kPa
Ⓑ Output type	
N	NPN open collector output 1 point
P	PNP open collector output 1 point

<Example of model number> PPD-A-P10PKN-H

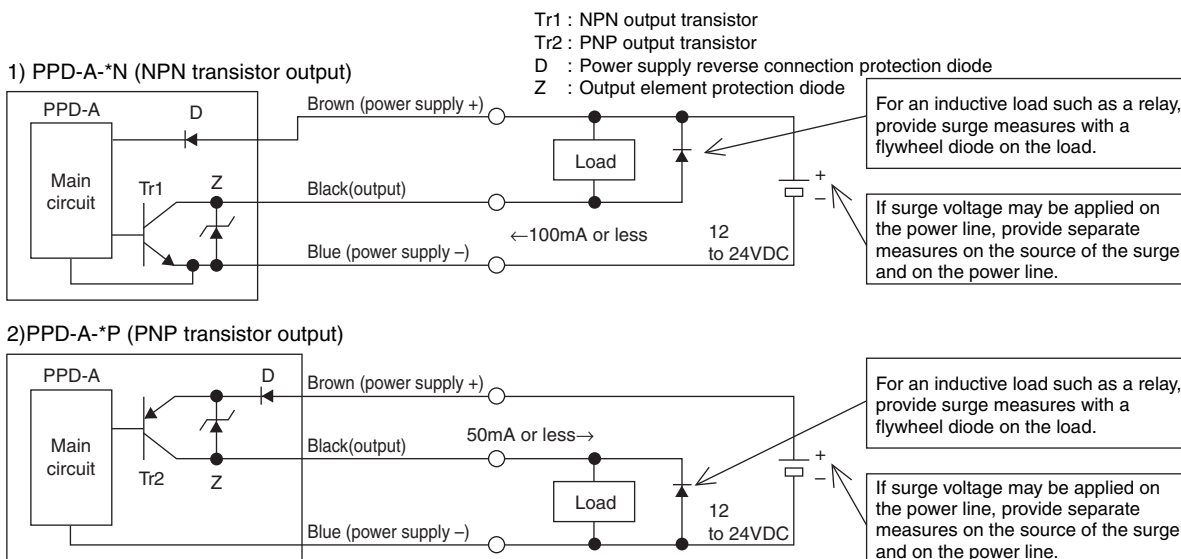
Indicates type with pressure range 0 to 0.98MPa, NPN transistor output type output, with protective box.

Dimensions



Refer to Safety precautions PPD Series on pages 1085 to 1087 for details.

(Internal circuit and connection method)

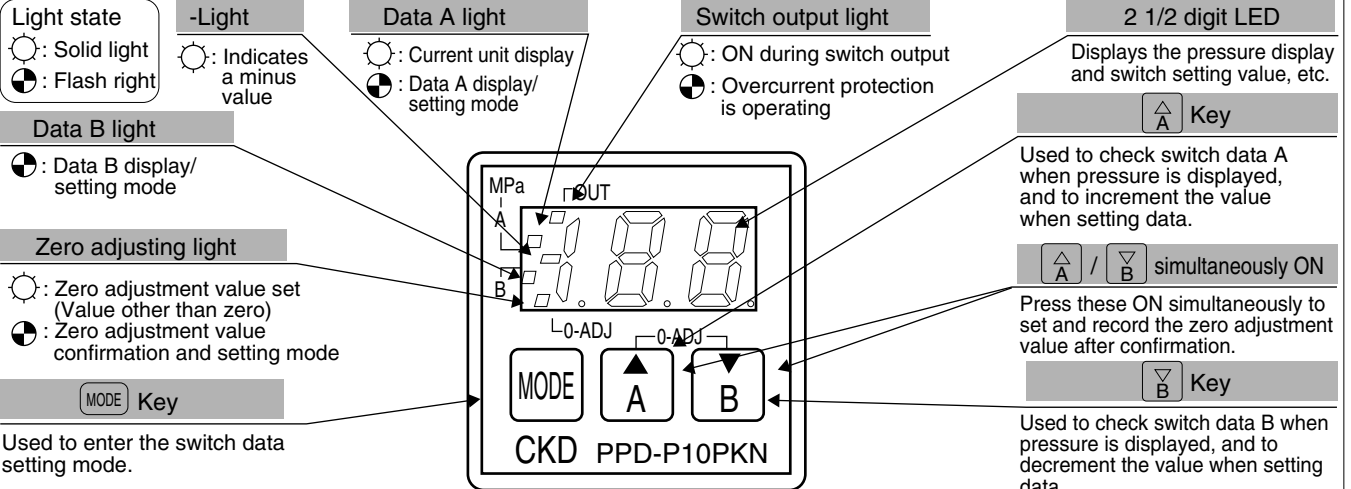


Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Electronic pressure switch
 Pressure sensor

Common for PPD/PPD-A/PPD-S

Display and controls



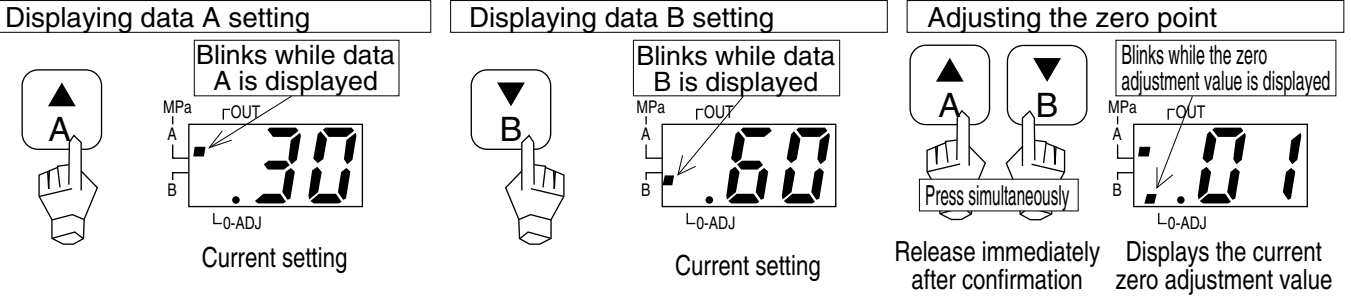
Numbers and letters are displayed with a combination of LED displays.

Value display	Number	0	1	2	3	4	5	6	7	8	9
Indicator		0	1	2	3	4	5	6	7	8	9

Model display	Model	P10PKN	P01AKN	V01AHN	Upper/lower limit indicator	Upper limit display	Lower limit display
Model display		A0	A1	A2		Hi	Lo
Displayed character		A0	A1	A2	Indicator	Hi	Lo
					Displayed character	Hi	Lo

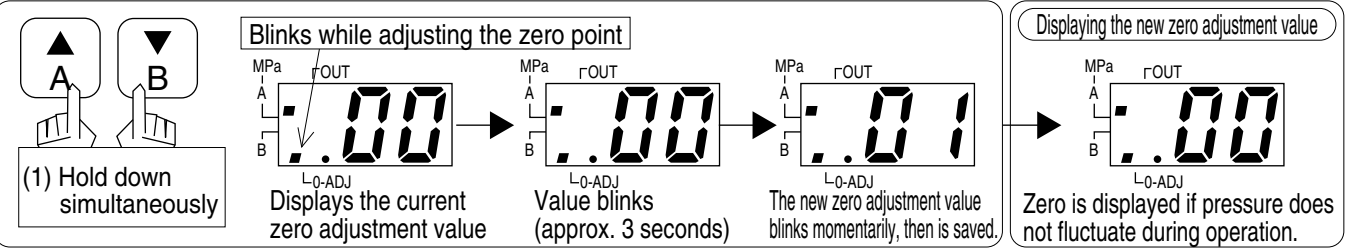
Set point confirmation method

Data A and data B, which are switch setting values, and the zero adjustment value are checked quickly with pressure display status.



Adjusting the zero point

The differential pressure display near zero can be set to the zero display. This value is adjusted within $0 \pm \text{approx. } 8\% \text{ F.S.}$



- If there is no deviation and the zero point need not be adjusted, the 0-ADJ light does not turn ON even when zero adjustment is started.
- If pressure exceeds the tolerable range, zero adjustment stops, data is cleared, and the 0-ADJ light turns OFF. (Tolerable range = $0 \pm 8\% \text{ F.S.}$)
 To clear an incorrect zero adjustment value, apply pressure higher than 20%F.S., then adjust the zero point.
- When the two steps above are taken, the 0-ADJ light turns ON after zero adjustment.

Excessive on positive pressure | Excessive on negative pressure

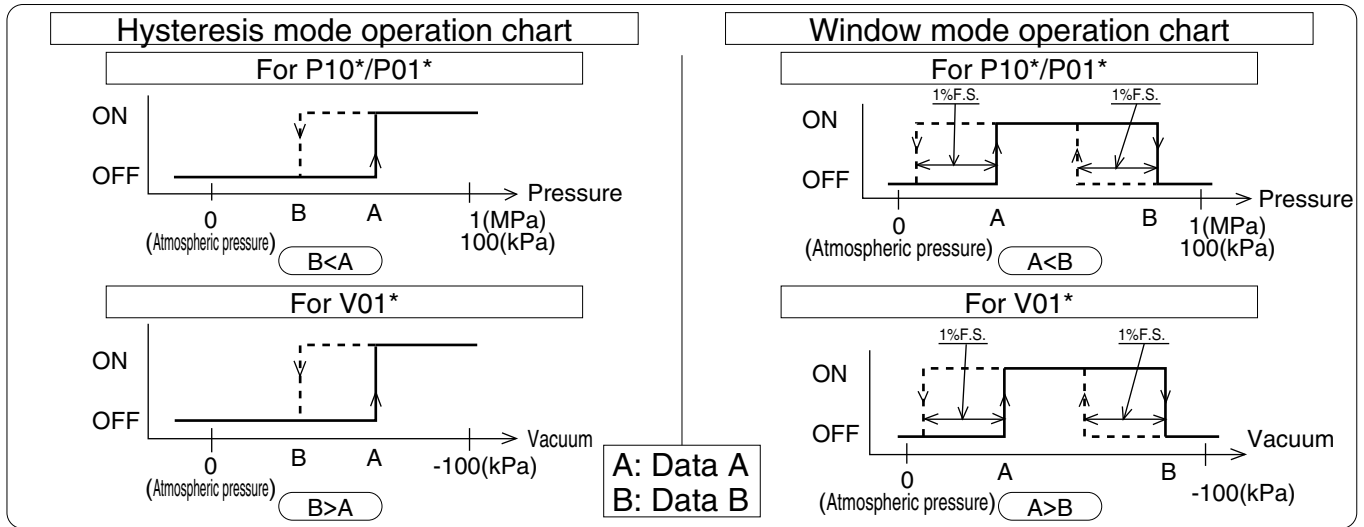


Clear data when the tolerable setting range has been exceeded.

Types of switch operation

Two operations can be selected based on the magnitude relation of switch data.

Two types of operation mode can be set based on the magnitude relation of two data (data A and data B). Refer to the operation chart and select the operation that suits the application, then determine settings for data A and data B. When not using or when stopping the switch function, disable data A or data B settings for safety. (There is a special display for disabling the settings.) Switch output is stopped (forcibly turned OFF) while settings are being made.



To ensure stable operations, provide the following differences with the minimum digit between data A and data B when making a setting:

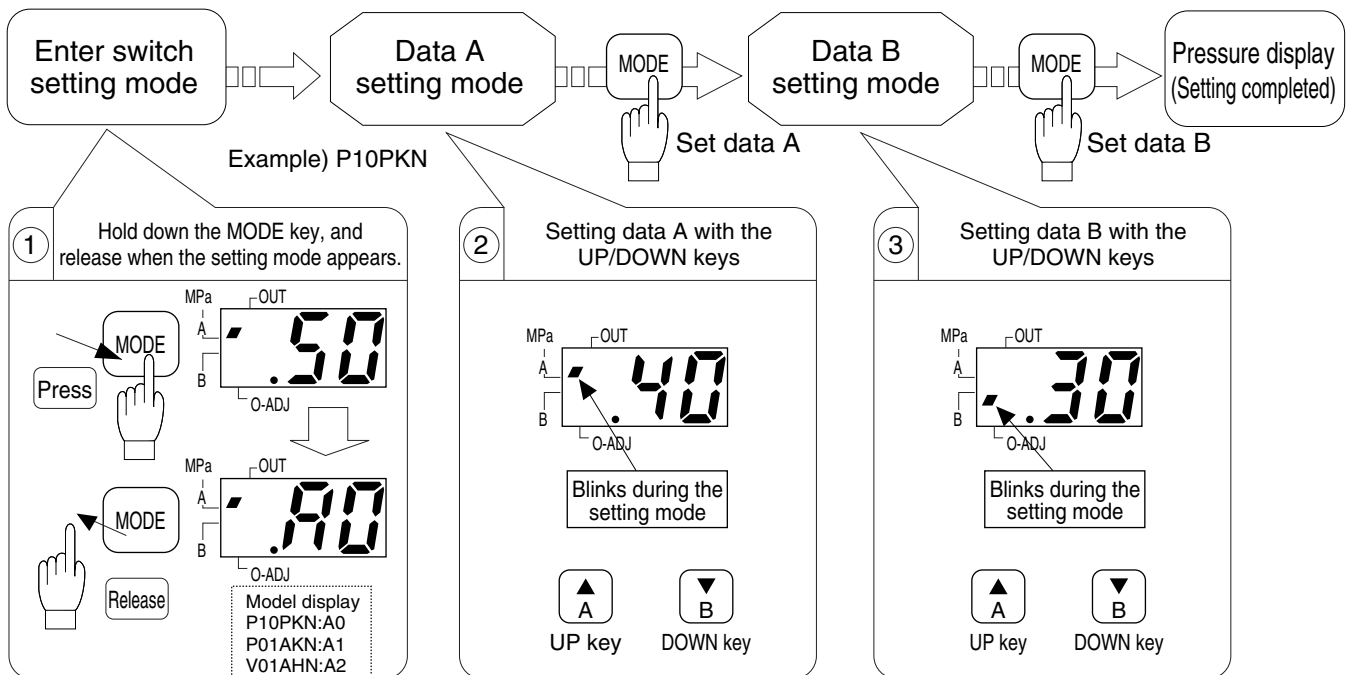
- Hysteresis operation : 1 and over
- Window operation : 3 and over

Do not use a setting where data A equals data B!

To stabilize wind operation, a hysteresis of 1%F.S. is automatically added.

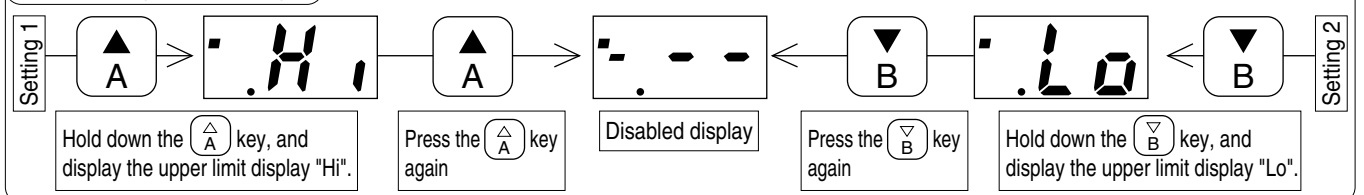
Setting data A and data B

Switch operation starts when data A and data B are set.



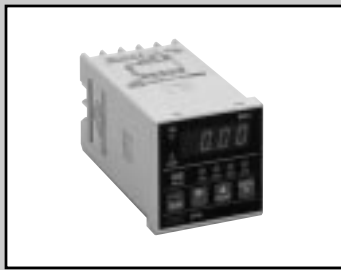
Disabling the setting

Disable both data A and B as follows when not using the switch function.



- Refrigerating type dryer
- Desiccant type dryer
- High polymer membrane type dryer
- Air filter
- Auto. drain / others
- F.R.L. (Module unit)
- F.R.L. (Separate)
- Compact F.R.
- Precise regulator
- F.R.L. (Related products)
- Clean F.R.
- Electro pneumatic regulator
- Air booster
- Speed control valve
- Silencer
- Check valve / others
- Joint / tube
- Vacuum filter
- Vacuum regulator
- Suction plate
- Magnetic spring buffer
- Mechanical pressure SW
- Electronic pressure SW
- Contact / close contact cont. SW
- Air sensor
- Pressure SW for coolant
- Small flow sensor
- Small flow controller
- Flow sensor for air
- Flow sensor for water
- Total air system
- Total air system (Gamma)
- Ending

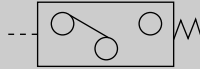
Electronic pressure switch
Pressure sensor



Electronic pressure switch

PPS2 Series

Due to semiconductor pressure sensor and 8 bits microcomputer, air pressure is displayed with digital display.



Refer to Intro 32 for details.



Overview

This product is high reliable and high precision pressure switch developed for pneumatic and vacuum systems. Different from conventional mechanical mechanism, configured with semiconductor pressure sensor and 8 bits one chip microcomputer. Precisely detected pneumatic/vacuum, the result is displayed with digital display. Switch output is 4 points to allow wide applications.

Features

- Can be used in adverse environment IP66 is available as option for front control panel of main body. Also, due to water proof IP67 in pressure sensor section of sensor separated type, the product can be used where water contacts to the product. Connect a water proof pipe to atmospheric release, while preventing water from entering.
- Compact design DIN standards size *48mm, and compact.
- Wide pressure range New positive/negative pressure (-0.1 to 0.5MPa) types are added, so wide pressure range is available.
- LED display Easy confirmation of pressure and set value in dark place.
- Independent 4 points of switch output 2 types of switching (window and hysteresis operations) can be set up to 4 points. There is no polarity to switch output. NO (normally open) and NC (normally closed) types are available.
- Easy installation and adjustment
- Easy zero point adjustment by front key operation
- Certain wiring by gland connection
- With analog output 0 to 5VDC

Specifications

Descriptions	PPS2-P01A (kPa)	PPS2-P10P (MPa)	PPS2-V01A (kPa)	PPS2-VPP (MPa)
Pressure range	0 to 100.0kPa	0 to 1.000MPa	0 to -101.3kPa	-0.101 to 0.5MPa
Min. display digit	0.1kPa	0.001MPa	0.1kPa	0.001MPa
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor			
Working fluid	Air/non-corrosive gas			
Withstanding pressure	150kPa	1.5MPa	150kPa	0.75MPa
Indicator	3 1/2 digit red LED display character height 8mm			
Display sampling rate	Approx. 4 times/second			
Power supply	11 to 26 VDC, 100mA (ripple ratio 1% or less)			
Set point holding	Maintaining for 10 years without energizing (E ² PROM)			
Display precision	±1%F.S.±1dig (at 25°C)			
Temperature characteristics	Zero shift : ±0.1%F.S./°C Span shift : ±0.1%F.S./°C			
Switch rated	Output no. : 4 points Current : MAX100mA Output type : Non-polar transistor Internal voltage drop : 3V or less Withstanding pressure : MAX30V			
Switch responsiveness	200Hz and over (5msec or less)			
Analog output	Output voltage : 0 to 5 VDC (0 to F.S.) Temperature characteristics : ±0.1%F.S./°C Precision : ±2%F.S. (at 25°C) Load impedance : 1KΩ and over			
Special function	<ul style="list-style-type: none"> • Zero point adjustment • Switch output load short-circuit protection and error display • Changing switch output mode of NO (normally open) and NC (normally closed) possible 			
Environment conditions	Ambient temperature range	0 to 50°C		
	Storage temperature range	-20 to 60°C		
	Working humidity range	0 to 85%R.H.		
	Water proof	None (Optional water resistant front operating section (IP66) is available)		
	Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm 2 hours per X, Y, Z direction		
	Mechanical shock proof	100m/s ² X, Y, Z each direction		
Port size	Rc1/8 (PT1/8 female thread)			
Weight	Approx. 180g (sensor body)			

Clean room specifications (catalog No. CB-033SA)

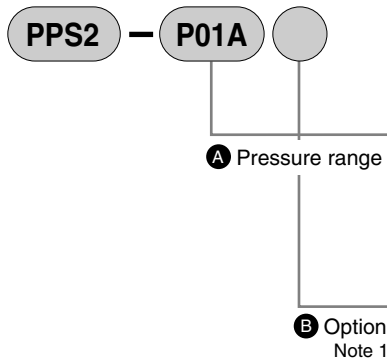
- Dust generation preventing structure for use in cleanrooms

PPS2..... P70

PPS2..... P80

How to order

● Sensor / Integrated type

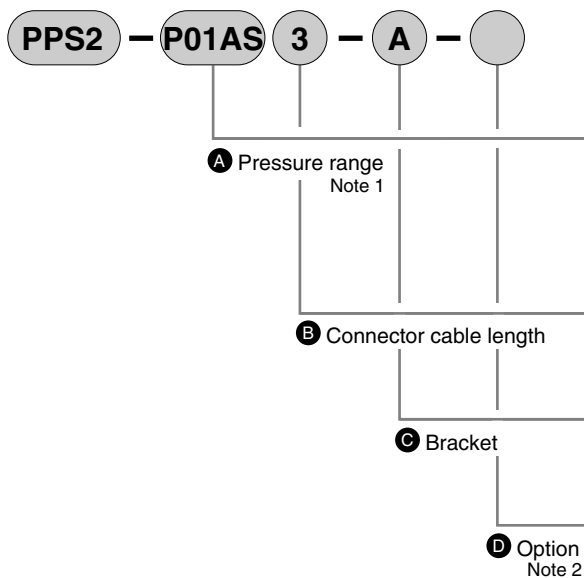


Symbol	Descriptions
A Pressure range	
P01A	0 to 100.0kPa
P10P	0 to 1.000MPa
V01A	0 to -101.3kPa
VPP	-0.101 to 0.5MPa
B Option	
Blank	No water proof
W	Water proof (IP66)

Note 1: Main body front control section only.

● Sensor, body separate type

Note: The main unit and sensor are adjusted as a set. Do not use a main unit and sensor having different lot numbers.

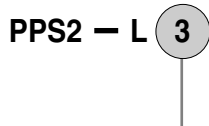


Symbol	Descriptions
A Pressure range	
P01AS	0 to 100.0kPa
P10PS	0 to 1.000MPa
V01AS	0 to -101.3kPa
VPPS	-0.101 to 0.5MPa
B Connector cable length	
3	3m
5	5m
C Bracket	
A	Bracket A (horizontal installation)
B	Bracket B (vertical installation)
D Option	
Blank	No water proof
W	Water proof (IP66)

Note 1: "S" indicates sensor/body separate type.

Note 2: Main body front control section only.
IP67 for sensor section.

Model no. of connector cable only

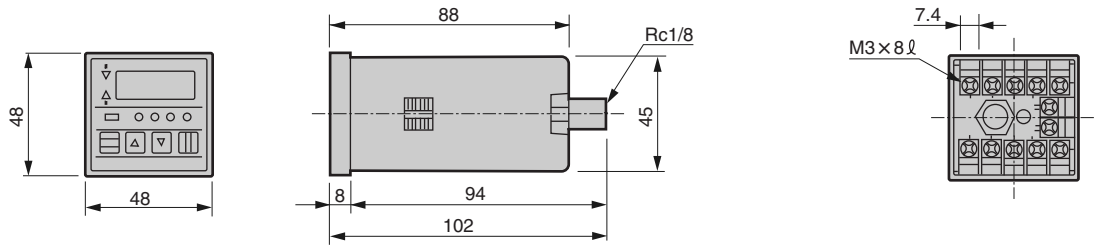


Symbol	Descriptions
Connector cable length	
3	3m
5	5m

Refrigerating type dryer
 Desiccant type dryer
 High polymer membrane type dryer
 Air filter
 Auto. drain / others
 F.R.L. (Module unit)
 F.R.L. (Separate)
 Compact F.R.
 Precise regulator
 F.R.L. (Related products)
 Clean F.R.
 Electro pneumatic regulator
 Air booster
 Speed control valve
 Silencer
 Check valve / others
 Joint / tube
 Vacuum filter
 Vacuum regulator
 Suction plate
 Magnetic spring buffer
 Mechanical pressure SW
 Electronic pressure SW
 Contact / close contact cont. SW
 Air sensor
 Pressure SW for coolant
 Small flow sensor
 Small flow controller
 Flow sensor for air
 Flow sensor for water
 Total air system
 Total air system (Gamma)
 Ending
 Electronic pressure switch
 Pressure sensor

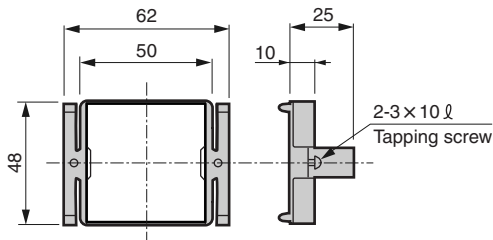
Dimensions

● Sensor, integrated type

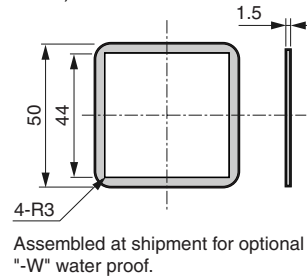


• Panel mount dimension (sensor integrated type / sensor separate type common)

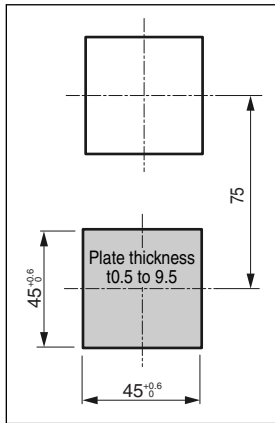
(Panel bracket)



(Gasket for panel mount)

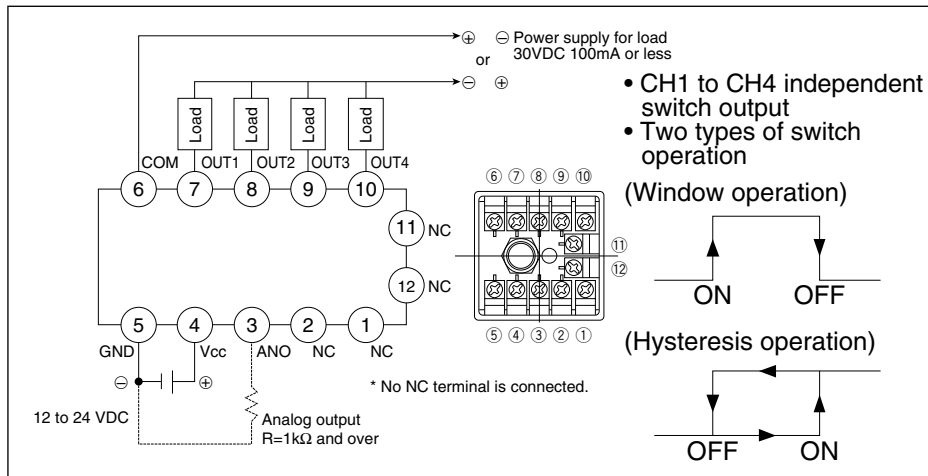


(Panel cut dimensions)



Connection method

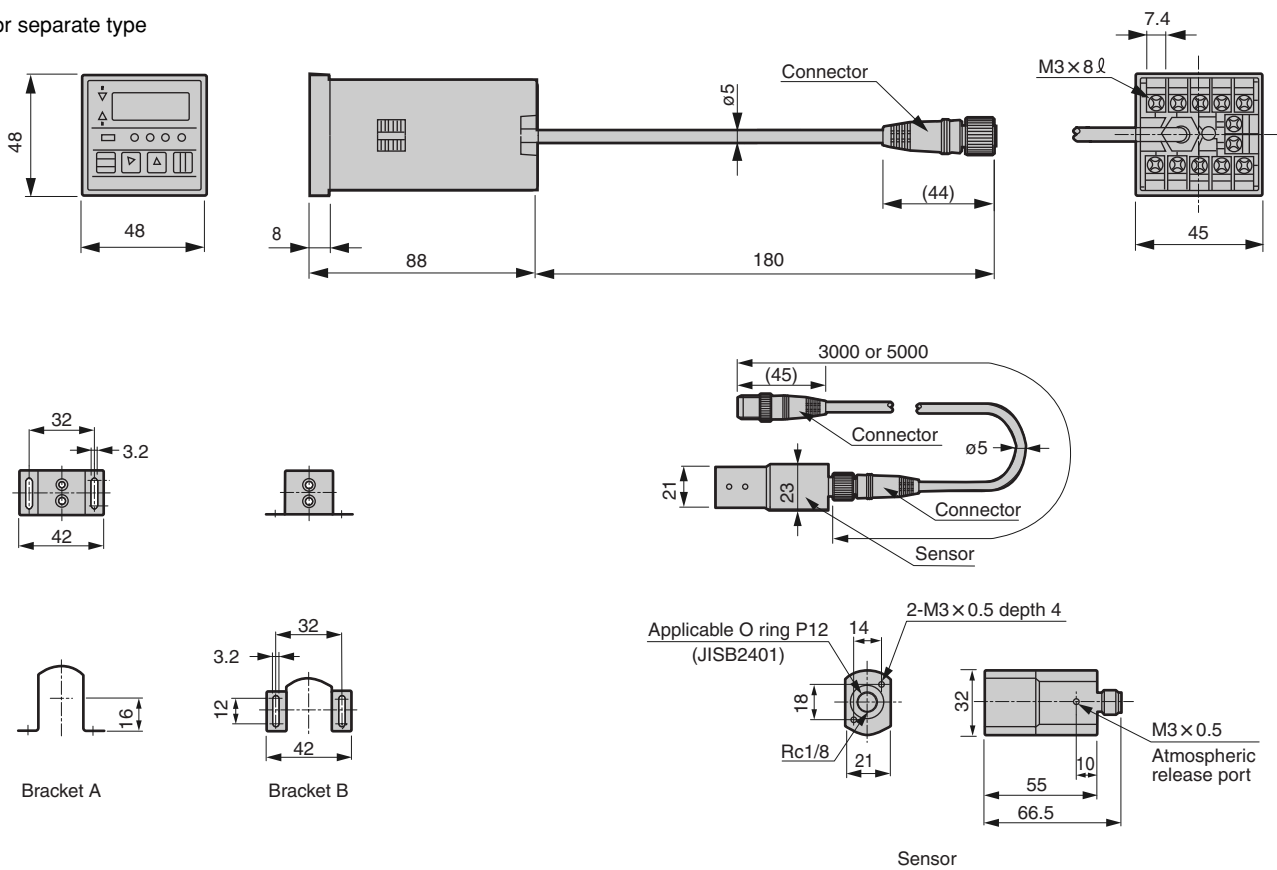
PPS2 switch type



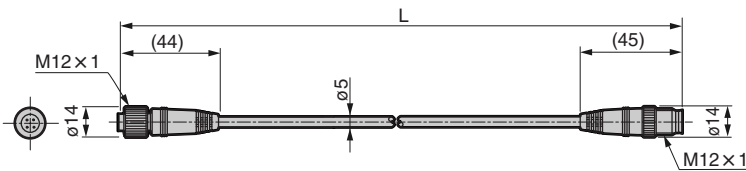
Refer to Safety precautions PPS2 Series on page 1088 for details.

Dimensions

● Sensor separate type



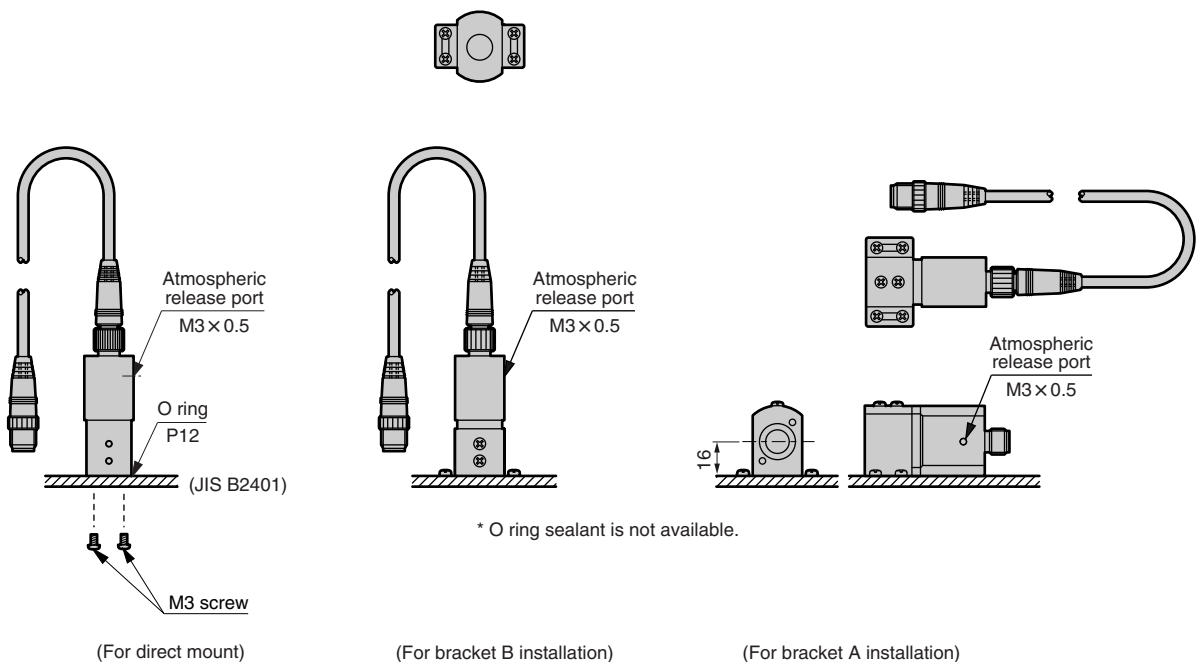
• Connector cable (PPS2-L3, PPS2-L5)



Pin No	Signal
1	+9V
2	Shield
3	GND
4	Sensor output

1		PPS2-L	
*1 Connector cable	Dimension		
3	3000 +100 0		
5	5000 +100 0		

• Sensor installation attitude



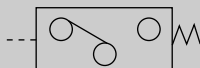
⚠ Refer to Safety precautions PPS2 Series on page 1088 for details.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending
Electronic pressure switch
Pressure sensor

PPS2 Series

Directive signal output function to sensors (electro pneumatic/electronic regulator and proportional valve) integrated.



Overview

This product, combined with electro-pneumatic proportional control components, is a pressure controller to control and set pressure digitally. Allowing 4 points of pressure setting, switch output is provided per set pressure to check feedback information.

Features

- Can be used in adverse environment
IP66 is available as option for front control panel of main body.
Also, due to water proof IP67 in pressure sensor section of sensor separated type, the product can be used where water contacts to the product. Connect a water proof pipe to atmospheric pressure inlet (M3×0.5) for atmospheric release, while preventing water from entering.
- Compact design
DIN standards size □48mm, and compact.
- LED display
Easy confirmation of set value in dark place.
- Easily connected to peripheral components
Peripheral components can be connected directly.
(EV Series, APC (3AP2))
- Easy setting of directive output
Only setting the required pressure value, directive signals can be outputted. Compensation is easily done on the front key operation.
- Easy zero point adjustment by front key operation
- Certain wiring by gland connection

Specifications

Descriptions	PPS2-APCP	PPS2-EV01A	PPS2-EV05P	PPS2-EV25P
Indicator Pressure range	0 to 1.000 MPa	0 to 100.0 kPa	0 to 1.000 MPa	
Min. display digit	0.001MPa	0.1kPa	0.001MPa	
Set pressure range	0.05 to 0.6 MPa	0 to 100.0 kPa	0 to 0.5 MPa	
Pressure sensitive element	Carrier diffusion type semiconductor pressure sensor			
Working fluid	Air/non-corrosive gas			
Withstanding pressure	1.5MPa	150kPa	1.5MPa	
Indicator	3 1/2 digit red LED display character height 8mm			
Display sampling rate	Approx. 4 times/second			
Power supply	24 VDC±10%, 100mA (Ripple ratio 1% or less)			
Set point holding	Maintaining for 10 years without energizing (E ² PROM)			
Display precision	±1%F.S.±1dig (at 25°C)			
Temperature characteristics	Zero shift : ±0.1%F.S./°C Span shift : ±0.1%F.S./°C			
Switch rated	Output no. : 4 points Output type : NPN open collector output Withstanding pressure : MAX30V Current : MAX100mA Internal voltage drop : 3V or less * If pressure ±0.01 MPa is reached (±1.0kPa for R310, EV01), switch output turns ON			
Switch responsiveness	200Hz and over (5msec or less)			
Input specifications (Setting pressure selection input)	Input no. : 4 points Input method : No voltage contact or NPN open collector input (negative logic) Min. input pulse amplitude : 50msec			
Sensors directive output	Output voltage : 0 to 10 VDC (0 to setting pressure F.S.) Temperature characteristics : ±0.1%F.S./°C			
Special function	<ul style="list-style-type: none"> • Zero point adjustment • Switch output load short-circuit protection and error display • Changing switch output mode of NO (normally open) and NC (normally closed) possible 			
Environment conditions	Ambient temperature range	0 to 50°C		
	Storage temperature range	-20 to 60°C		
	Working humidity range	0 to 85%R.H.		
	Water proof	None (Optional water resistant front operating section (IP66) is available)		
	Mechanical vibration proof	10 to 55Hz compound amplitude 1.5mm 2 hours per X, Y, Z direction		
	Mechanical shock proof	100m/s ² X, Y, Z each direction		
Port size	Rc1/8 (PT1/8 female thread)			
Weight	Approx. 180g (sensor body)			

Clean room specifications (catalog No. CB-033SA)

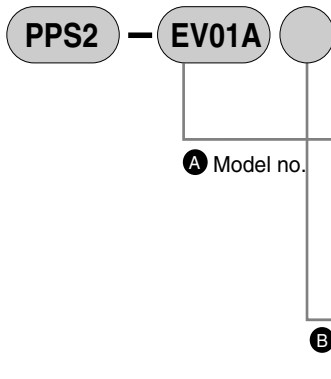
- Dust generation preventing structure for use in cleanrooms

PPS2 ————— (P70)

PPS2 ————— (P80)

How to order

● Sensor, Integrated type



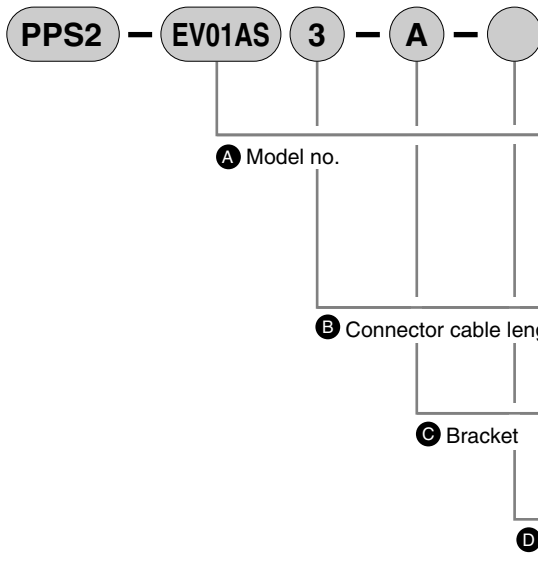
Symbol	Descriptions
A Model no.	
APCP	APC (3AP2) (MPa)
EV01A	EV0100 (kPa)
EV05P	EV0500 (MPa)
EV25P	EV2500 (MPa)
B Option	
Blank	No water proof
W	Water proof (IP66)

Note 1: A pressure switch which input signal voltage range is 0 to 10 V should be used.

Note 2: Main body front control section only.

● Sensor, body separate type

Note: The main unit and sensor are adjusted as a set. Do not use a main unit and sensor having different lot numbers.

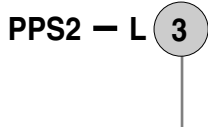


Symbol	Descriptions
A Model no.	
APCPS	APC (3AP2) (MPa)
EV01AS	EV0100 (kPa)
EV05PS	EV0500 (MPa)
EV25PS	EV2500 (MPa)
B Connector cable length	
3	3m
5	5m
C Bracket	
A	Bracket A (horizontal installation)
B	Bracket B (vertical installation)
D Option	
Blank	No water proof
W	Water proof (IP66)

Note 1: A pressure switch which input signal voltage range is 0 to 10 V should be used.

Note 2: Main body front control section only. IP67 for sensor section.

Model no. of connector cable only



Symbol	Descriptions
Connector cable length	
3	3m
5	5m

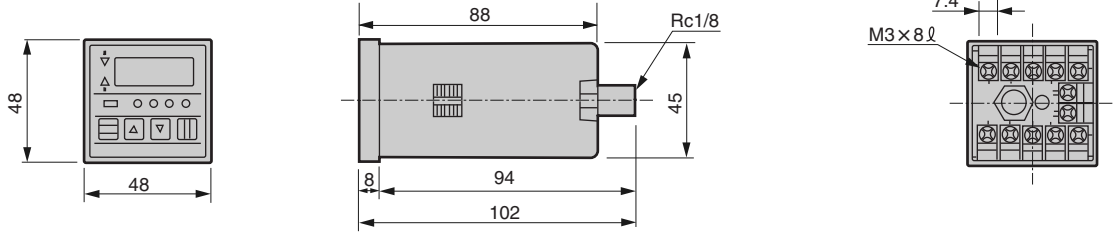
Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L (Module unit)
F.R.L (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure controller
Pressure sensor

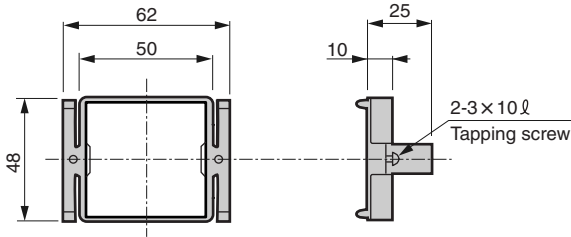
Dimensions

● Sensor, integrated type

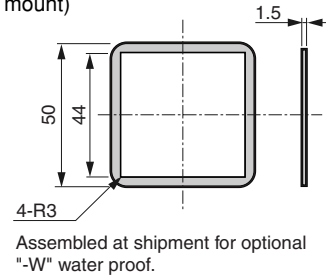


● Panel mount dimension (sensor integrated type / sensor separate type common)

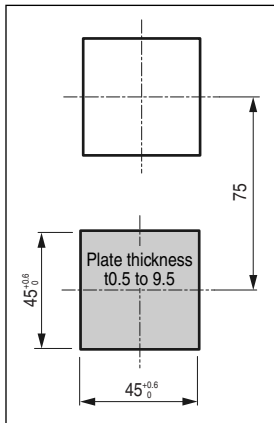
(Panel bracket)



(Gasket for panel mount)

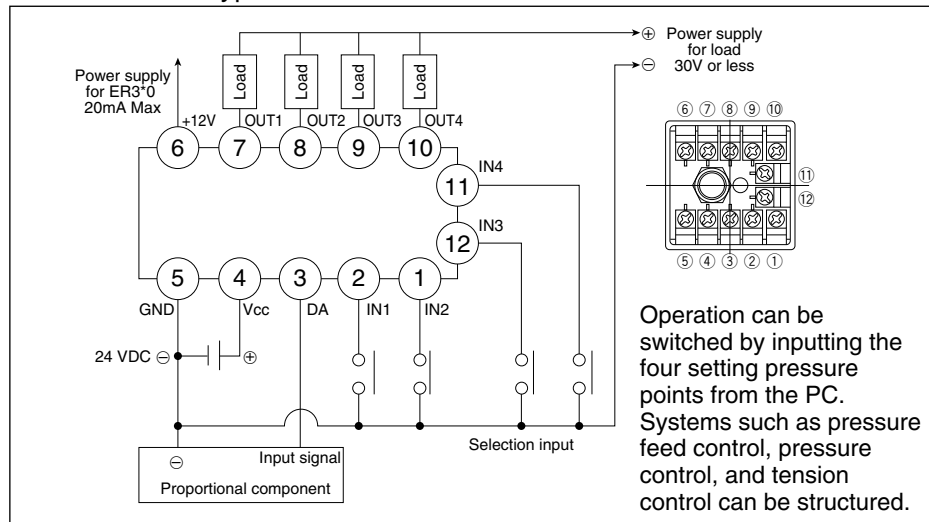


(Panel cut dimensions)



Connection method

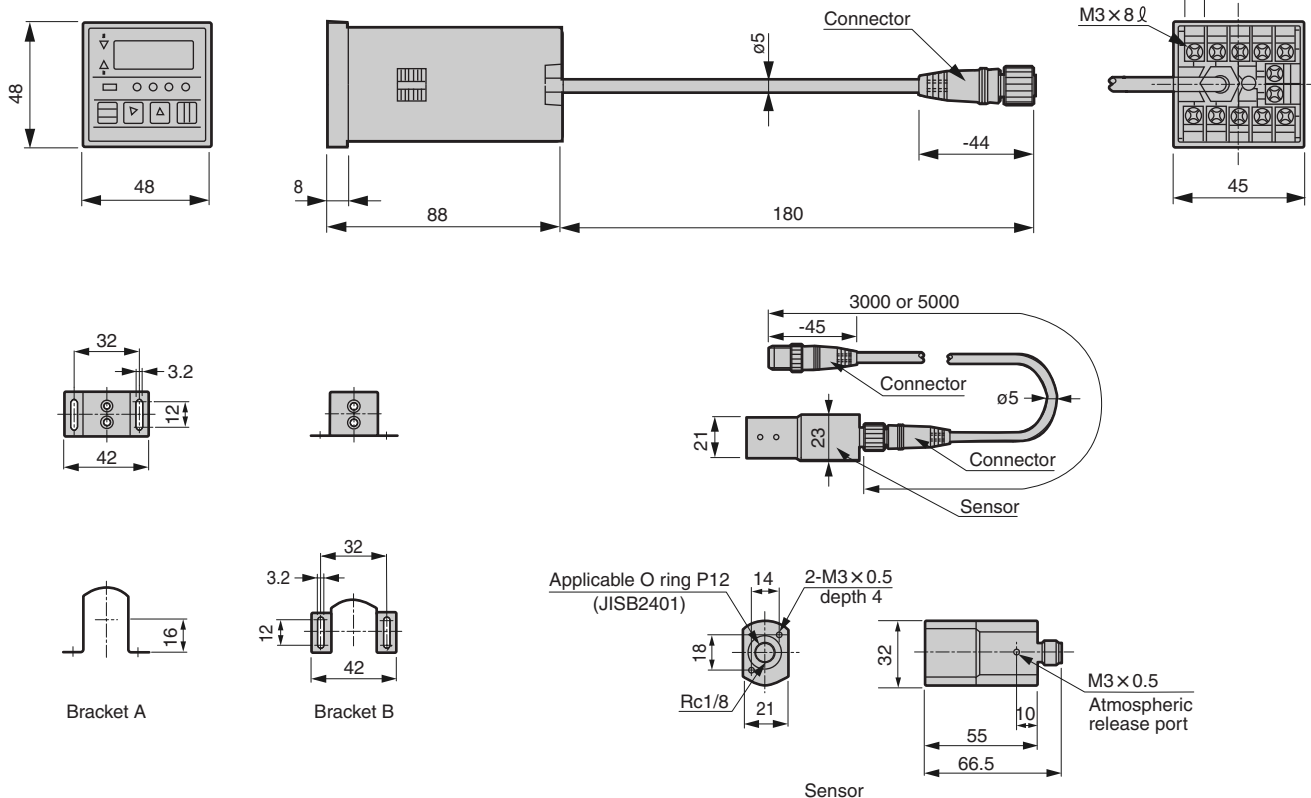
PPS2 controller type



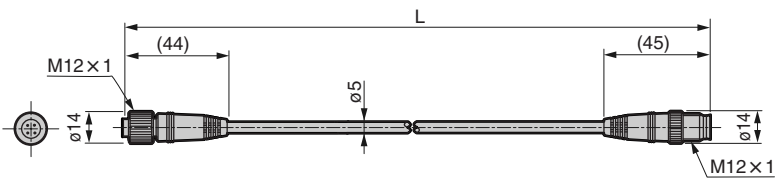
Refer to Safety precautions PPS2 Series on page 1088 for details.

Dimensions

● Sensor separate type



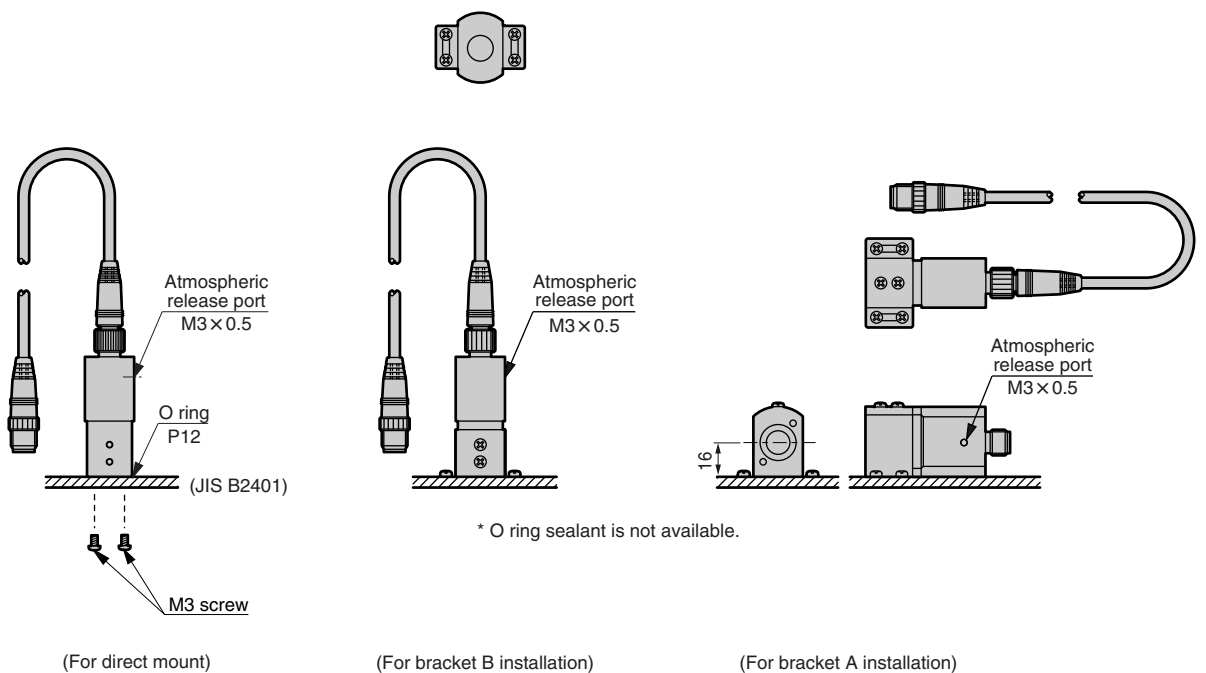
• Connector cable (PPS2-L3, PPS2-L5)



Pin No	Signal
1	+9V
2	Shield
3	GND
4	Sensor output

1 PPS2-L		*1 Connector cable	Dimension
		3	3000 +100 0
		5	5000 +100 0

• Sensor installation attitude



Refer to Safety precautions PPS2 Series on page 1088 for details.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L (Module unit)
F.R.L (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)

Ending

Electronic pressure controller
Pressure sensor