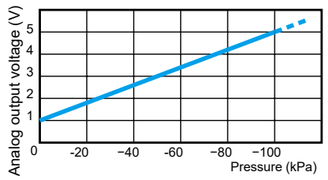
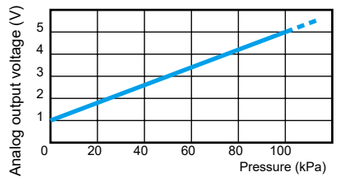
Analog output voltage - pressure characteristics

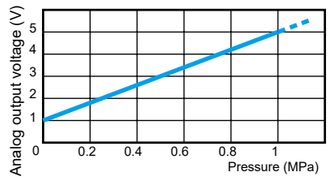
●PPE-V01A-□



●PPE-P01A-□

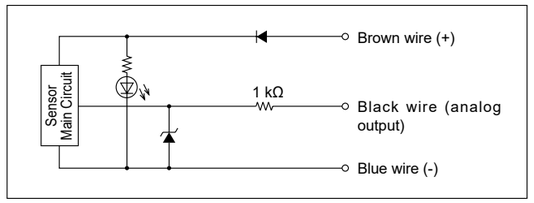


●PPE-P10A-□



Internal circuit / connection method

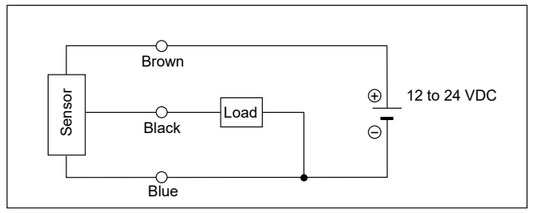
●Internal circuit diagram



●Lead wire color and content

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

●Connecting the lead wire



Pneumatic components (electronic pressure switch and sensor)

Safety Precautions

Be sure to read this section before use.
For general pneumatic components precautions, refer to Intro 17 for details.

Product-specific cautions: Compact electronic pressure sensor Analog output PPE-/A Series

Design / Selection

⚠WARNING

■Use this product in accordance with 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.

■Never use this product in an explosive gas atmosphere.
The pressure switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere 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 Please.

■Power supply voltage
Do not use this product at levels exceeding the power supply voltage. If voltage exceeding this range or AC power supply (100 VAC) is applied, the controller could rupture or burn.

■DC power not insulated from the AC primary side may damage the product and power, possibly leading to electric shock. Do not use the product in this case.

■How to wire
Turn power OFF before wiring this product. Discharge static electricity charged in the 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
This product and its wiring should be installed as far away from noise sources such as strong power lines as possible. Take separate countermeasures against surge that enter the power wire.

■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.

■Analog output accuracy
Analog output accuracy is affected by temperature characteristics and heat generated when energized. Provide a standby time (5 minutes or more after energizing) before use.

■Connecting load
The output impedance of the analog output section is 1 kΩ . If the impedance of the connecting load is small, output error increases. Check error with the impedance of the connecting load before using.

Example of calculation

(PPE-□A output impedance: Ro = 1 KΩ
Load internal impedance: Rx = 1 MΩ

$$\text{Output value} = (1 - \frac{Ro}{Ro + Rx}) \times 100\%$$

$$= (1 - \frac{1\ k\Omega}{1\ k\Omega + 1\ M\Omega}) \times 100\%$$

Output value error ⇨approx. 0.1%

■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 mistaken power source polarities, etc. Failure to observe this could result in rupture or burning.

⚠CAUTION

■Applicable fluid
When using applicable fluid other than air; nitrogen gas, etc., oxygen deficiency could be caused. Observe the following instructions.
- ●Use in well ventilated locations.
- ●Ventilate the work area when nitrogen gas is being used.
- ●Inspect nitrogen gas piping regularly to avoid leaks.
- ●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 PPD3-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 burst onto the product, check that it does not exceed the specified proof pressure.

■Working environment
- ●Avoid use in locations subject to vibration or shock of 100 m/s^2 or more.
- ●Check the temperature of fluid being measured and the environmental temperature in piping.
- ●When using a type that does not have the corresponding degree of protection, do not use for applications in which water or oil could be applied.

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

■Take care when using this product for an interlock circuit.
When using the pressure switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a switch (sensor) other than a pressure switch as a safeguard against breakdown. Regularly inspect and confirm that the interlock activates correctly.

■Response time is affected by working pressure and load volume. If reproducibility with stable response time 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 from the source.
- When using a components (switching regulator, inverter motor, etc.) that could generate noise near the sensor, be sure to ground the components 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.

■Care must be taken for protection of body and lead wire.
- Do not bump or drop the body, or apply excessive bending or tensile strength to the lead wire. This may lead to disconnection.
- Connect and wire bend-resistant material, such as robot wire material, for movable sections.

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

■When releasing the secondary control pressure, such as air blowing, into the atmosphere, the pressure could fluctuate depending on the piping and flow conditions. Test with actual working conditions, or contact CKD.

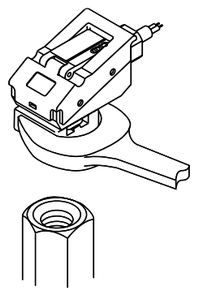
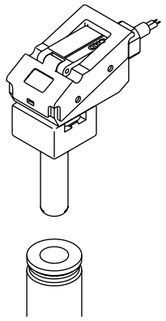
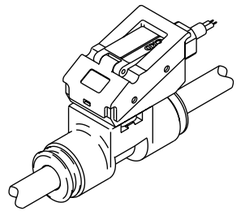
■Components When selecting dryer, air filter, oil mist filter or regulator, select a device with a flow rate higher than that used by proportional pressure controls.

■CE-compliance working conditions
The standard for the immunity for industrial environments applied to CE conforming product is EN61000-6-2, but the following requirements must be satisfied in order to conform to this standard.
Conditions
- The evaluation of this product is performed by using a cable that has a power supply line and a signal line paired to assess the product's performance.
- This product is not equipped with surge protection. Implement surge protection measures on the system side.

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

■The degree of protection 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
		
Use sealing tape or sealant, and catch a wrench against the width across flats (13 mm) of the R1/8 fitting to install. (Precautions) The tightening torque is 1.0 to 1.5 N·m or less. Resin parts may be damaged if tightened too far.	Insert the CKD 6 mm tube push-in fitting and use. (Precautions) ・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 fitting. GW Series GWJ Series	Insert the 6 mm tube into the two push-in fittings and use. (Precautions) ・Use the designated tube and plastic plug. Tube outer diameter accuracy Nylon, soft nylon tube: Within ±0.1 mm Polyurethane tube: +0.1 mm or less New urethane tube: −0.2 mm or more and with hardness of 93˚ and over. ・Securely insert the tube completely to the end, and make sure that the tube cannot be pulled out. If the tube is not fully inserted, it could be dislocated or air could leak. ・Cut the tube with a dedicated cutter and always at a right angle.

For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → "Model No.→ Instruction Manual