



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.

Electronic pressure switch with digital display (pressure switch) PPD3 Series

During Design and 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.

■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 100m/s² 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 preceding 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 components, be sure to ground the sensor 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.

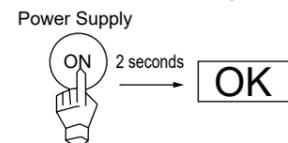
■When releasing the secondary control pressure, such as air blowing, into the atmosphere, the pressure could fluctuate depending on the piping and flow conditions. Test with actual working conditions, or contact CKD.

■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.

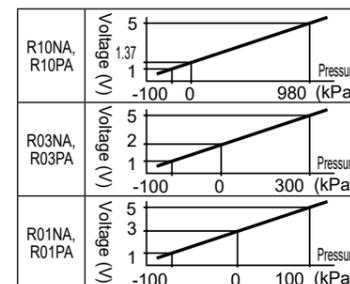
■The internal circuit is self-diagnosed immediately after power is turned ON, so pressure is not detected immediately. Set the control circuit so that signals are ignored for about 2 seconds after power is turned ON.



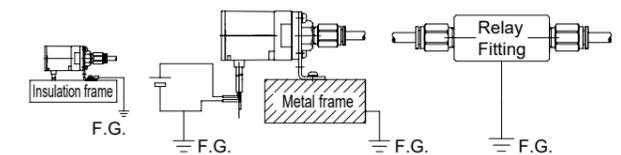
■Overcurrent protection turns the output OFF when overcurrent is detected. However, the output is repeatedly turned ON for a short time at a set cycle. This causes power supply voltage to fluctuate and may adversely affect peripheral devices.

■When using this product for compressed air containing water or oil, use the PPD3-S (stainless steel diaphragm sensor specifications) with increased corrosion resistance.

[Analog output voltage waveform]

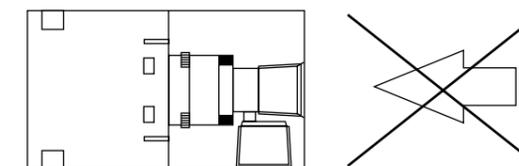


■Install the PPD3-S on a frame or panel connected to the frame ground (F.G.) and, if necessary, directly connect from the PPD3-S port to the F.G. When leading fluids in from an external device, connect via a relay fitting connected to the F.G. (To provide safety when using conductive fluids)



■PPD3-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 varistor (limit voltage approx. 40 V) is connected between the internal power circuit and port/mounting section of this PPD3-S to prevent dielectric breakdown of the sensor. Avoid withstand voltage and insulation resistance tests between the PPD3-S internal power supply circuit and port/installation section. Disconnect PPD3-S wiring first if this testing is required. An excessive potential difference between the PPD3-S power supply and port/installation section could burn internal parts. After installing, connecting and wiring the PPD3-S, electrical welding of the device/frame, short-circuit accidents, etc., could cause welding current, excessively high voltage caused by welding, or surge voltage, etc., to run through the wiring, ground wire, or fluid path connected between the above devices, damaging wires or devices. Conduct any work such as electrical welding after removing this device and disconnecting all electric wires connected to the FG.

■Care must be taken for entry of water and drainage. PPD3-S uses a stainless steel diaphragm pressure sensor that is not damaged by water. However, when water and condensate in the air collide with the pressure sensor during vacuum breakage after vacuum adsorption confirmation, the inrush inertia of the water may damage the pressure sensor and prevent normal pressure indication. If water or drainage can 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. In addition, this type has a ø1 built-in orifice inside the pressure port.



Take special care when using the back ports of the 6B type in case of possible entry of water or drainage.

Pressure switch

Electronic pressure switch
Contact Confirm Switch
For Coolant Pressure Switch

Pressure switch

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Ending

Ending

■ Degree of protection, atmospheric introduction port processing precautions

- The product may be prone to damage when in a state of being unpacked or being installed. The protective functions are effective when the product is correctly installed, wired and piped. Provide protection so that 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 introduction 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 in a dry environment with no barometric pressure differences.

Recommended tube: Soft nylon tube model No. FH-3224
Urethane tube model No. U-9532, U-9504

[IMPORTANT] Never apply pressure to the atmosphere inlet port!

■ If the inlet port for the atmosphere introduction port pressure is pressurized, protective performance could be lost, and the case could rupture or pop off. Set as atmospheric pressure. 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 countermeasures to prevent pressurized air from being applied.

- Even when the protective performance is not required, if this product is installed in a humid environment with large temperature variations, condensation in the case is prevented by taking these measures. (Condensation is fatal to the electric circuits.)
- If this product is in a control panel, pressurized to a positive pressure or negative pressure within a dry environment, the pressure difference could affect indicator accuracy. Please be careful.
- This product is intended to protect city water. Protection performance cannot be guaranteed for hot water, oil, coolant (non-water soluble/water soluble), solvents, acids, alkalines, 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 could be lost. Please be careful.

MEMO

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](#)