

COPAL ELECTRONICS

ELECTRONIC PRESSURE SWITCH

PS6

CE [Compliance with EMC Standards]

INSTRUCTION MANUAL Ver.1.0

Thank you very much for purchasing our product. For safe and proper use of the product, please thoroughly read this manual and understand the contents before using. Also, please keep this manual in a safe place for future reference.

For more detailed information please ask for the nearest distributor or the following sales center.

COPAL ELECTRONICS

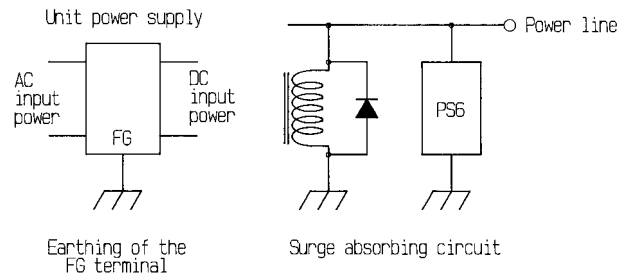
Nishi-Shinjuku Kimuraya Bidg., 7-5-25
Nishi-Shinjuku Shinjuku-ku Tokyo 160-0023, Japan Phone. : (03)3364-7055

WARNING

⚠ CAUTION...This caution mark describes when there is a possibility that user may suffer from damage or physical damage may occur if the product is used improperly.

⚠ CAUTION

- The product is neither drip proof nor dust proof structure. Never use it under the condition where water or oil drips, dust rises, or corrosion occurs.
 - Do not use corrosive gases or liquids as pressure media.
 - Do not apply a pressure that exceeds the maximum pressure.
 - Do not short-circuit the output terminals of the switch to other terminal. Also, do not connect a load in which a current over 80mA may flow to/from the switch. Otherwise, the internal circuitry may be damaged.
 - When handling the product, be sure to pick up the body and not to give an excessive force to the cable.
 - When performing piping work on the product, be sure to hold the product on the port section and tighten pipes with torque less than the specified torque.
- For stability, use a regulated DC power supply.
Surge absorbing circuits (diodes, varistors, etc.) are necessary if inductive loads such as relays and solenoids are connected to the same power line as the PS6.
 - If using a DC power supply unit such as a switching power supply, the FG terminal should be earthed. (See the figure below.)
 - Use pH neutral detergents to clean the body. Do not use lacquer thinner and other solvents for cleaning.



MODEL NUMBER DESIGNATION

Please identify the model number of the product you purchased.

PS 6 - □□□□ - □□□□

<p>Pressure range</p> <p>102V : 0~100kPa</p> <p>102G : 0~100kPa</p> <p>103G : 0~1MPa</p>	<p>Output transistor configuration</p> <p>N : NPN open collector</p> <p>P : PNP open collector</p>	<p>Switch output type</p> <p>A : One-switch output (variable hysteresis) and Analog output</p> <p>W : Two-switch output (fixed hysteresis)</p>	<p>Fitting part type</p> <p>R : R1/8 with M5 female screw</p> <p>M : M5 female screw</p>
--	--	--	--

PIPING

① When using R1/8 fitting:

Use a wrench on the port section of the body to tighten with a torque of 4.9 N·m or less. Apply sealing tape if necessary.

② When using commercially available fitting for M5 female screw:

Hold the switch on the port section. Tighten the fitting with a wrench with a torque of 0.49 N·m or less.

⚠ Do not directly hold the switch body when tightening. Do not use a wrench to any other part than the port section when tightening. Such handling may cause a breakage of the switch.

WIRING

The wires should be connected as shown in the table below. Be sure to connect the wires properly.

Color	□A□ type	□W□ type
Brown	Power supply	Power supply
Blue	Common	Common
Black	Switch output	Switch output 1
White	Analog output	Switch output 2

※ Be earthing the shield wire if necessary.

SETTING

① □A□ type (one switch output)

- Place the display selector switch (MODE) in the "SW" position.
- Turn the pressure setting trimmer (SET) to set the switch operating pressure.
- Turn the hysteresis adjustment trimmer (HYS) to get your desired hysteresis.
- Place the display selector switch (MODE) back in the "ME" position.

Pressure measurement mode



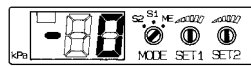
Switch setting mode



② □W□ type (two switch outputs)

- Place the display selector switch (MODE) in the "S1" position.
- Turn the pressure setting trimmer 1 (SET1) to set the switch 1 operating pressure.
- Place the display selector switch (MODE) in the "S2" position.
- Turn the pressure setting trimmer 2 (SET2) to set the switch 2 operating pressure.
- Place the display selector switch (MODE) back in the "ME" position.

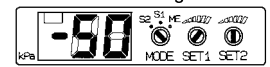
Pressure measurement mode



Switch 1 setting mode



Switch 2 setting mode



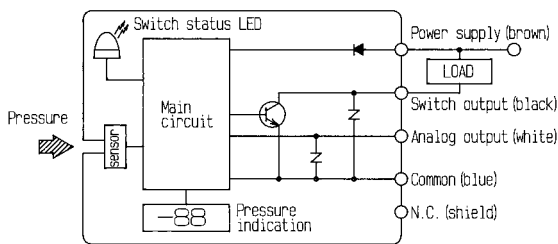
※ For further precise setting, apply the pressure and get the optimum pressure level by adjusting trimmers several times.

※ The setting range of the switch, adjustable range of the setting trimmer in other words, does not agree with the rated indication range of the display. Even though the indication of the display is "0 through 99", the switch can be set at the pressure under 0 or over 99 with the extra margin of a few% FS.

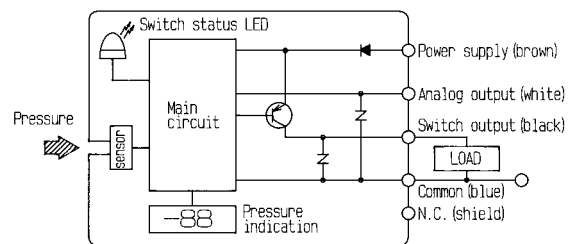
⚠ When setting the display selector switch and the pressure-setting trimmer, be careful not to apply too much force to them. The allowable torque for the display selector switch and the pressure setting trimmer should be no more than 0.025 N·m.

INTERNAL CIRCUITS

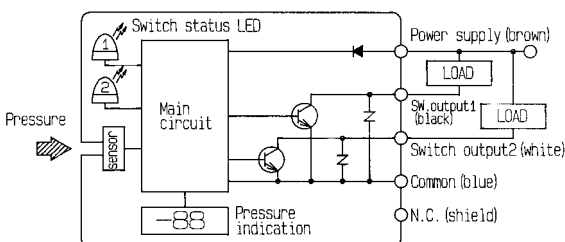
① NA□ type (one NPN output)



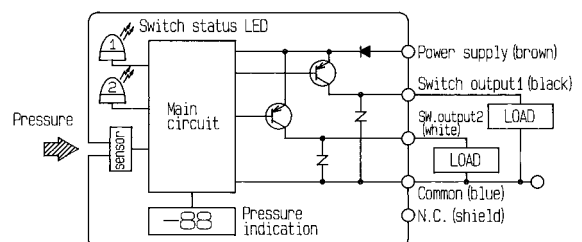
② PA□ type (one PNP output)



③ NW□ type (two NPN outputs)

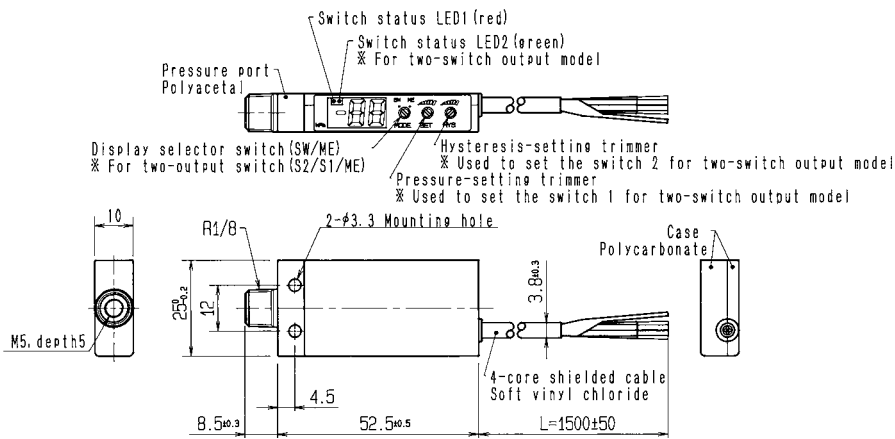


④ PW□ type (two PNP outputs)

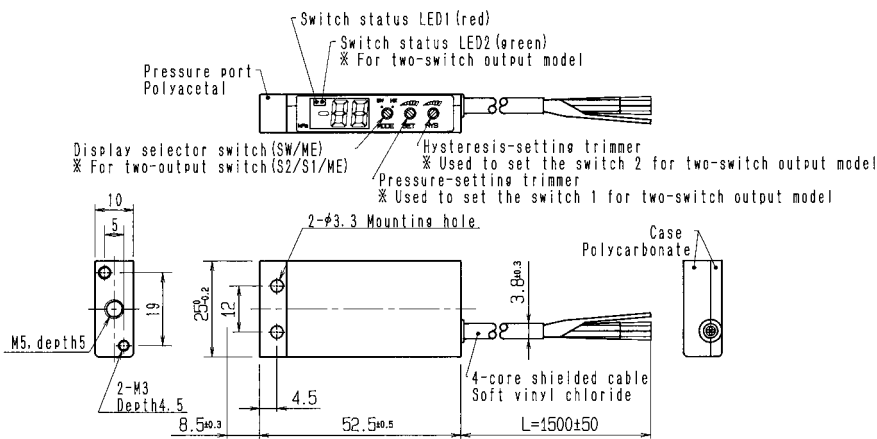


OUTLINE DIMENSIONS (unit:mm)

① □□R type (Fitting part : R1/8 with M5 female screw)



② □□M type (Fitting part : M5 female screw)



MAJOR SPECIFICATIONS

① General specifications

Type (indicator)	Gauge pressure		
	Pressure media	Non-corrosive gases	
Operating temperature	-10~60°C		
Storage temperature	-20~70°C		
Compensated temperature	0~50°C		
Pressure range	102V	102G	103G
Rated pressure	-100kPa	100kPa	1.0MPa
Maximum pressure	200kPa	200kPa	1.5MPa
Breakdown pressure	500kPa	500kPa	2.0MPa

② Power supply

Driving power voltage	12~24V (±10%)
Current consumption	35mA maximum (No load switch "ON")

③Switch outputs

Setting range	0~Rated pressure
Setting method	Adjustable with single turn trimmer
Number of settable output	<input type="checkbox"/> A <input type="checkbox"/> type: 1 <input type="checkbox"/> W <input type="checkbox"/> type: 2
Hysteresis	<input type="checkbox"/> A <input type="checkbox"/> type: about 0 ~15% FS (adjustable) <input type="checkbox"/> W <input type="checkbox"/> type: about 2% FS maximum (fixed)
Working chart	<p>The working chart is a graph with pressure on the x-axis. The x-axis is marked with 0kPa, Setting, and Rated pressure. The y-axis has two levels: ON (top) and OFF (bottom). A horizontal line at the ON level starts at the 'Setting' point and continues to the 'Rated pressure' point. A horizontal line at the OFF level starts at 0kPa and ends at the 'Setting' point. A vertical line goes up from the OFF level to the ON level at the 'Setting' point. A vertical line goes down from the ON level to the OFF level at a point slightly to the left of the 'Setting' point. The horizontal distance between these two vertical lines is labeled 'Hysteresis'.</p>
Switch rating	30V, 80mA maximum (per output)
Residual voltage	N <input type="checkbox"/> <input type="checkbox"/> type: 0.8V max. (at flow-in current load of 80mA) P <input type="checkbox"/> <input type="checkbox"/> type: 1.2V max. (at flow-out current load of 80mA)
Accuracy	±3% FS max. (0~50°C, reference temperature 25°C)

④Pressure indication

Number of digits of display	2 digits		
Display element	LED (red)		
Pressure range	102V	102G	103G
Rated indication	-0~-99kPa	0~99kPa	. 0~.99MPa
Sampling cycle	Approx. 4 times per second		
Accuracy	±3% FS±2 count (0~50°C, reference temp. 25°C)		

⑤Analog output (A type only)

ZERO voltage	1±0.1V
SPAN voltage	4±0.1V
Output current	1mA max. (output load should be 5kΩ minimum)
Thermal error	ZERO : ±0.1% FS/°C SPAN : ±0.1% FS/°C
Linearity/Hysteresis	±0.5% FS

⑥EMC

Standard	EN61326-1 : 1997/A1 : 1998
Accuracy	±5%FS

WARRANTY

This product can be covered by one-year warranty. COPAL ELECTRONICS warrants that the any part of the product, which proves to be defective due to the design and/or manufacturing of COPAL ELECTRONICS within one year from the date of delivery, will be repaired or replaced, free of charge.

Note that the warranty will only be applied to the product alone, not to damages induced by any failure of the product. However, the warranty will not be applied in any of the following cases.

- ①Failure and damage caused by improper use not conforming to the instruction manual or negligent handling.
- ②Failure and damage caused by inappropriate modification, adjustment or repair.
- ③Failure and damage caused by natural disaster, fire or other act of God.