

COPAL ELECTRONICS

Pressure Transducers with Amp.
PA-870/PA-878series

Pressure Switch
PS87series

INSTRUCTION MANUAL Ver.2.0

Thank you for purchasing NIDEC COPAL ELECTRONICS CORP. product.

In order to use the product correctly and most appropriately, please completely read this manual before use and keep it for future reference.

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

COPAL ELECTRONICS

Nishi-Shinjuku Kimuraya Bldg., 7-5-25
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Handling Notes for Safety use

Before operating our product, read this manual thoroughly. You may not understand all of the explanations the first time thorough, but be on the lookout for any special directions.

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

Caution Piping:

Install the product by screwing the pressure port to the matching fitting.

During this operation, put the wrench only to the hexagonal portion and do not give any unnecessary force to the main body and the lead wire.

Caution Wiring:

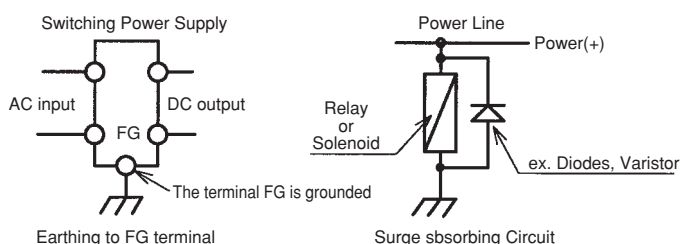
The connection of wiring is as shown in the table below.

P/N Wire color	PA-870	PA-878	PS87
Red	Power (+)	Power (+)	Power (+)
Black	Common	No Connection	Power (-)
White	Analog output	Output	Switch output (+)
Green	None	None	Switch output (-)
Gray(Shield)	Fitting	Fitting	None

* Never short-circuit the switch output(s) to the other terminals, nor connect them to the low impedance load that would allow the output current over 100mA. These conduct might damage the internal circuitry.

Caution Others:

- (a) This product can be used for liquids/gases compatible with SUS316 and Hastelloy® C-22.
 - (b) Never insert a foreign matter such as wire through the pressure port.
 - (c) Never take in the over-pressure exceeding the maximum pressure.
 - (d) Never short-circuit the switch output to the other terminals, nor connect them to the low impedance load that would allow the output current over 100mA. These conduct might damage the internal circuitry.
 - (e) Use a stable DC power supply for the power source. A surge absorbing circuit (diodes, varistor, etc.) is necessary if an inductive load such as a relay or solenoid is connected to the power line and/or to the switch output(s). The FG terminal on the unit power supply should be earthed.
- (Please refer to the following diagrams)



1. PART NUMBER DESIGNATION

*Please confirm the part number of the product you purchased.

PA — 870 — *** P — B — R2
A B C D

A: Part name PA-870

PA-870: Pressure Transducer with Amp. (Analog voltage output)

PA-878: Pressure Transducer with Amp. (Analog current output)

PS87: Pressure Switch

B: Rated pressure range

203P: 2 [MPa] 353P: 3.5 [MPa] 503P: 5 [MPa]

*Note 1. 203P is not available in PS87 series

C: Drip-proof structure

B: Without drip-proof cover (IP-54)

H: With drip-proof cover (IP-65)

D: Fitting

R2: R1/4 (PT1/4)

2. ACCESSORIES

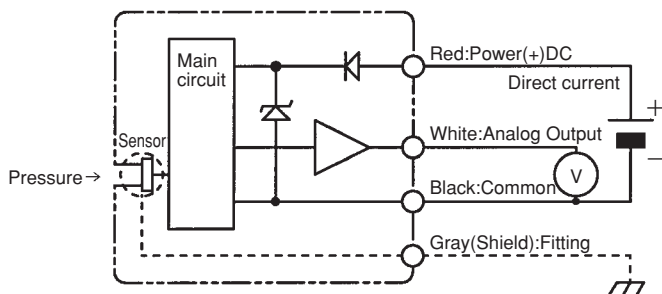
Instruction Manual

3. SETTING METHOD OF SWITCHING PRESSURE

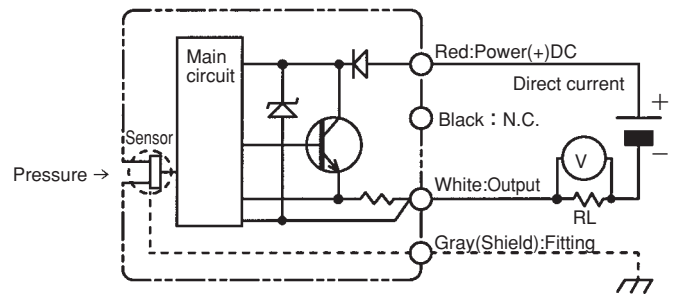
- ① Turn the Hysteresis setting VR (on the left side) at a suitable angle.
- ② Apply pressure up to the point where switch operation is needed. Then slowly turn the VR (on the right side) to the clockwise until the LED turns on.
- ③ Reduce pressure and confirm the LED is turns off.

4. INTERNAL ELECTRICAL SCHEMATICS

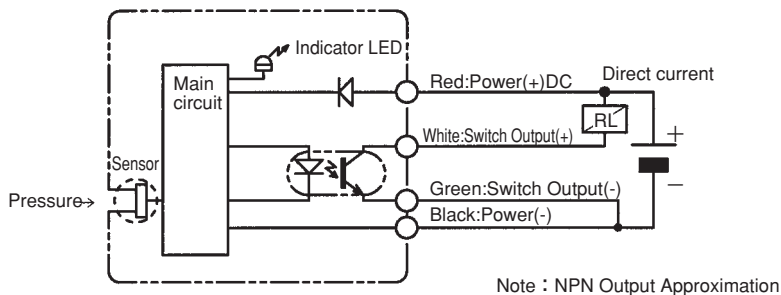
PA-870



PA-878

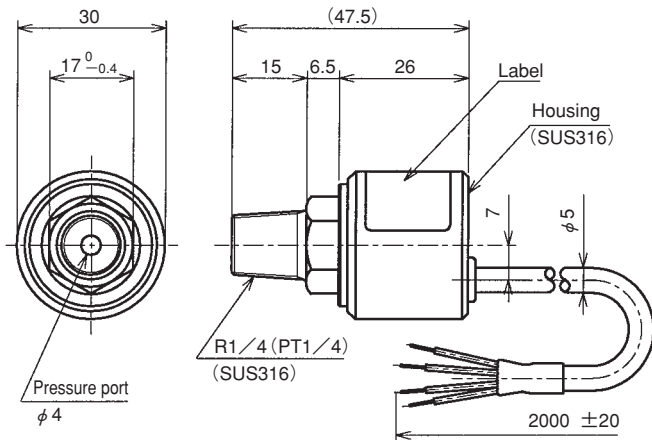


PS87

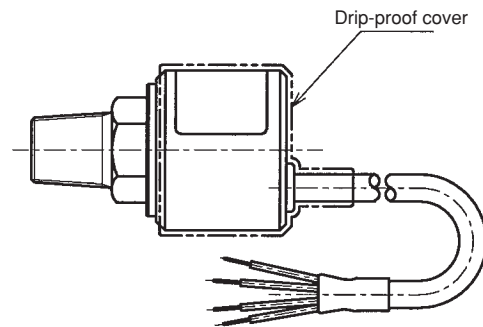


5. OUTLINE DIMENSIONS

5.1 Outline dimensions

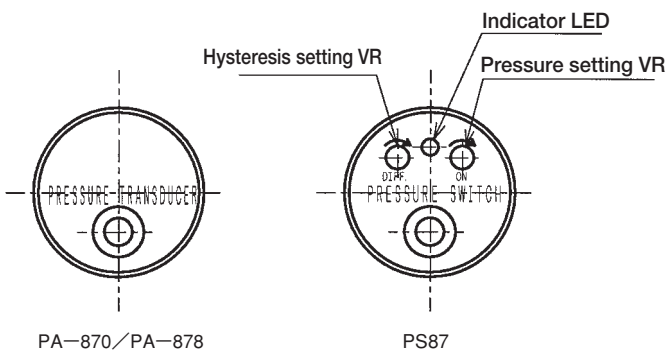


5.2 Drip-proof cover type



Please make sure that the drip-proof cover is properly placed over the main body and the cable.

5.3 Rear



6. SPECIFICATIONS

6.1 General specifications

Item	Specifications
Operating temp.range	-10~75°C
Compensated temp.range	0~50°C
Operating humidity	35~85%RH (No condensation)
Storage temp.	-20~90°C (Atmospheric pressure, humidity 65%RH maximum)
Pressure medium	Corrosive gases/liquids compatible with SUS316 and Hastelloy® C-22
Cable	3 - core shielded cable (PA-870, PA-878) 4 - core cable (PS87)
Drip-proof structure	Without drip-proof cover: IP-54, With drip-proof cover: IP-65
Net Weight	Approx. 190g

6.2 Power

Item	Specifications
Supply voltage	10.8~26.4V DC
Consumption current	10mA maximum (PA-870) 15mA maximum (PS87)

6.3 Switch output (PS87)

Item	Specifications
No. of outputs	1
Output interface	Open collector output which insulated a photo-coupler
Setting method	Adjustable by VR
Adjustable range	10~105 % of rated pressure range
Display	Red LED ON
Accuracy	$\pm 3\%$ F.S. (Reference temp. : 25°C)
Hysteresis	Approx. 1~10 %S.F. of setting range
Switching capacity	35 V DC 100 mA
Residual voltage	1.2V maximum
Response	Approx. 2ms

6.4 Analog output

Model number		PA-870	PA-878
Item			
Output voltage/current		1~5 V DC	4~20 mA DC
Zero voltage/current		1 \pm 0.05 V	4 \pm 0.1 mA
Span voltage/current		4 \pm 0.05 V	16 \pm 0.1 mA
Linearity/Hysteresis		$\pm 0.5\%$ F.S.	
Thermal error	ZERO	$\pm 0.05\%$ F.S./°C	
	SPAN	$\pm 0.05\%$ F.S./°C	
Load resistance		10 k Ω minimum	500 Ω maximum (At power voltage 24 V)
Responses		2ms maximum	

7. WARRANTY

This product is covered by warranty for a period of one year from the date of delivery. This warranty is only applicable to this product itself. This warranty covers free-of-charge repair and replacement for defects occurring through design or manufacturing inadequacy of NIDEC COPAL ELECTRONICS CORP. Even during the warranty period, the following failures will be handled on a fee basis.

- 1) Failure or damages occurring through misuse or disoperation performed not following the instruction manual, the catalog and the specification sheet.
- 2) Failure or damages occurring through improper modification, adjustment, or repair.
- 3) Failure or damages occurring through technically and scientifically unpredictable factors.
- 4) Replacement of accessories (e.g. O-ring rubber, etc.)




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