

COPAL ELECTRONICS

Pressure transducer with amp

PA-850

Electronic pressure switch

PS85

INSTRUCTION MANUAL Ver.1.3

Thank you very much for purchasing our product. In order to derive its desired characteristics and utilize it with high reliability, please thoroughly read this manual and understand the contents before using.

And, please keep this manual and read again when necessary.

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

COPAL ELECTRONICS

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Nishi-Shinjuku Shinjuku-ku Tokyo 160-0023, Japan Phone.:(03) 3364-7055

Notes to users

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. (ex., ⚠ Caution:)

⚠ Caution: This indicates the precaution in handling and/or the risk in misusing.

⚠ Caution Piping

Install the product by screwing the pressure port to the matching fitting Please put the wrench the hexagonal portion only and do not give any unnecessary force to the main body and the lead wire.

⚠ Caution Wiring

Wiring connection must be done as instructed below without fail.

| Part No. Wire's color | Connection | |
|--------------------------|---------------|-----------------|
| | PA-850 | PS85 |
| Brown | Power(+) | Power(+) |
| Blue | Common | Common |
| Black | Switch output | Switch output 1 |
| White | Analog output | Switch output 2 |
| Shield | _____ | _____ |

Never make any short-circuits the switch output(s) to the other terminals. These conduct will damage the internal circuitry.

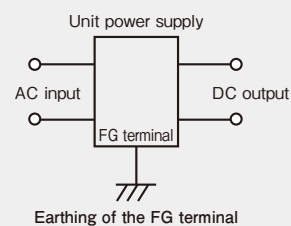
⚠ Caution Handling

- (1) The products can be used for corrosive gases/liquids compatible with SUS 316L.
- (2) Never insert any foreign matter except the specified pressure media into the pressure port fitting.
- (3) Never take in the over-pressure exceeding the maximum pressure which is the double of rated pressure.
- (4) Never connect the switch output(s) to the load that would allow the output current over 100mA.
- (5) For stability, use a regulated direct current power supply.

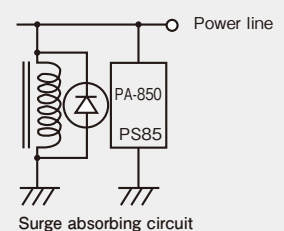
Surge absorbing devices (diodes, varistors, etc.) are necessary if inductive loads such as relays or solenoids are connected to power line and /or to the switch output(s).

The FG terminal on the unit power supply should be earthed. (Refer to the diagrams below)

- (6) The top portion of the "VC" fitting is finished like a mirror surface. Handle the product so as not to damage it.
- (7) Do not touch or scratch the diaphragm at the edge of the fitting, as this may alter the performance characteristics or damage the diaphragm, and cause malfunctioning.



Earthing of the FG terminal

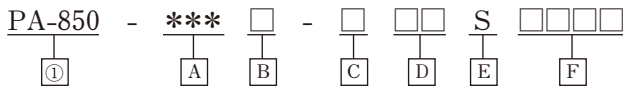


Surge absorbing circuit

1. PART NUMBER DESIGNATION

◎ Pressure transducer with amp. / PA-850

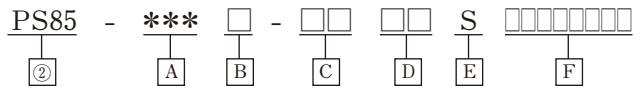
Analog voltage output (1~5V)+one switch output (adjustable hysteresis) type



※E and F represent the additional in case of the switching pressure level preset type.

◎ Electronic pressure switch/ PS85

Two switch outputs (fixed hysteresis) type



※E and F represent the additional in case of the switching pressure level preset type.

■ Part number designation

①、② : Part name

① : PA-850 pressure transducer with amp.

② : PS85 electronic pressure switch

A : Rated pressure

102 : 100 [kPa]

352 : 350 [kPa]

302 : 300 [kPa]

103 : 1 [MPa]

B : Pressure reference

G : Gauge pressure

A : Absolute pressure

V : Vacuum pressure

R : positive and negative pressure(-100kPa to rated pressure)

C : Switch configuration (See 6.6 working chart of switching mode)

①PA-850 series

②PS85 series

N : NPN (Upper limit)

N1 : NPN (Upper, Upper limit)

P : PNP (Upper limit)

P1 : PNP (Upper, Upper limit)

N2 : NPN (Upper, Lower limit)

P2 : PNP (Upper, Lower limit)

D : Shape of the fitting portion

R2 : R1/4 (PT1/4)

GF : G3/8 (PF3/8)

G2 : G1/4 (PF1/4)

VC : Gasket fitting (9/16-18UNF)

E : Switching pressure level preset type

Blank : Not preset type

S : Preset type

F : Preset pressure level when switch output(s) turn (s) on

Blank : Not preset types

4 figures : Preset types of PA-850 (One switch output types)

8 figures : Preset types of PS85 (Two switch outputs types)

※ For more details of part number designation please refer to the specifications.

2. ACCESSORIES

O-ring : Pressure port fitting ; G1/4,G3/8

Trimmer seal : In case of a trimmer part's taking drops of water, please stick a trimmer seal. Trimmer must be properly protected against water.

3. ADJUSTMENT OF SWITCHING PRESSURE

◎PA-850

① Apply the pressure to turn on the switch and get the switching point by adjusting the trimmer on the left. (Refer to 5(5))

② Get the appropriate hysteresis by adjusting the trimmer on the right. (Refer to 5(5))

◎PS85

① Apply the pressure to turn on the switch 1 and get the switching point by adjusting the trimmer on the left. (Refer to 5(5)) (The Red LED lighted when the switch 1 is ON.)

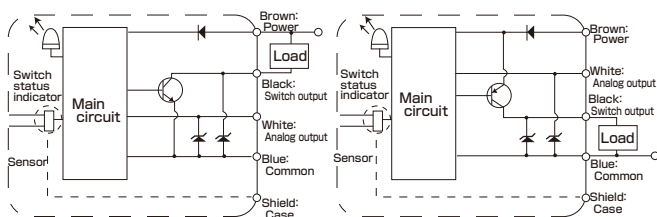
② Apply the pressure to turn on the switch 2 and get the switching point by adjusting the trimmer on the left. (Refer to 5(5)) (The Green LED lighted when the switch 2 is ON.)

4. INTERNAL ELECTRICAL SCHEMATICS

(1) PA-850

NPN Output type

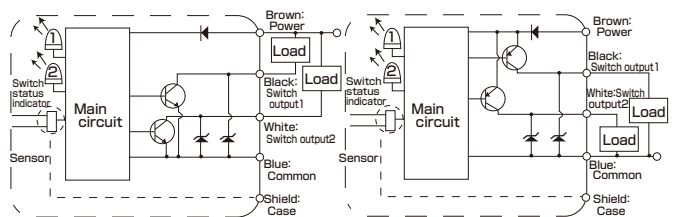
PNP Output type



(2) PS85

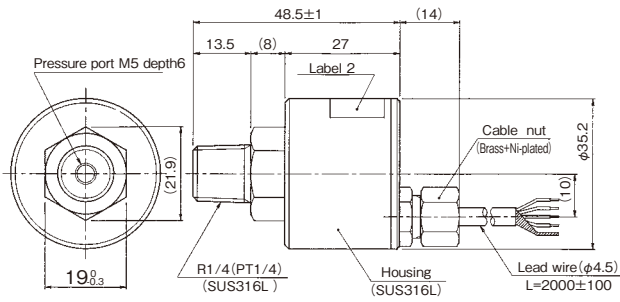
NPN Output type

PNP Output type

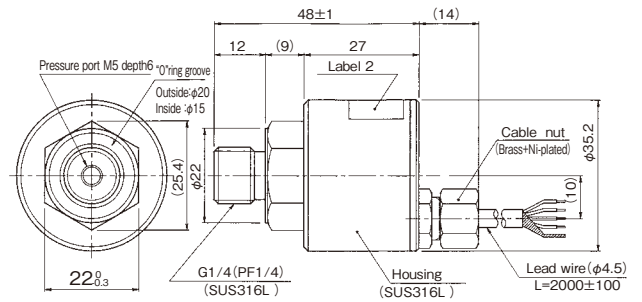


5. OUTLINE DIMENSIONS (unit : mm)

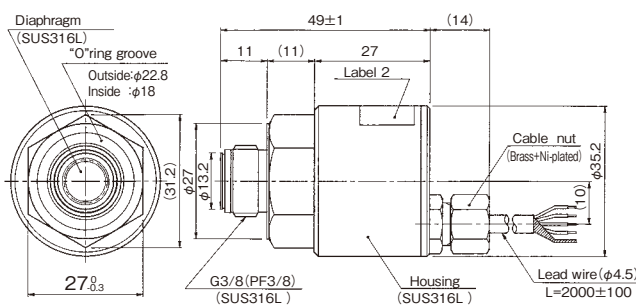
(1) PA-850/PS85, R2 type



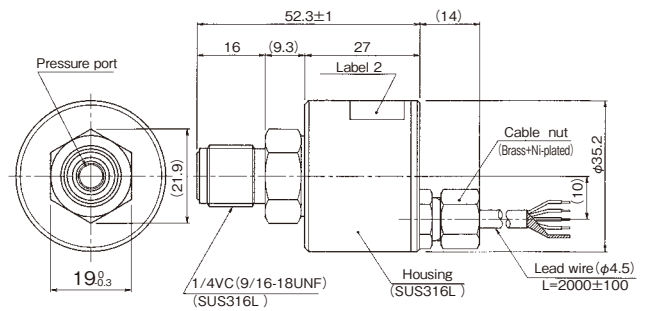
(2) PA-850/PS85, G2 type



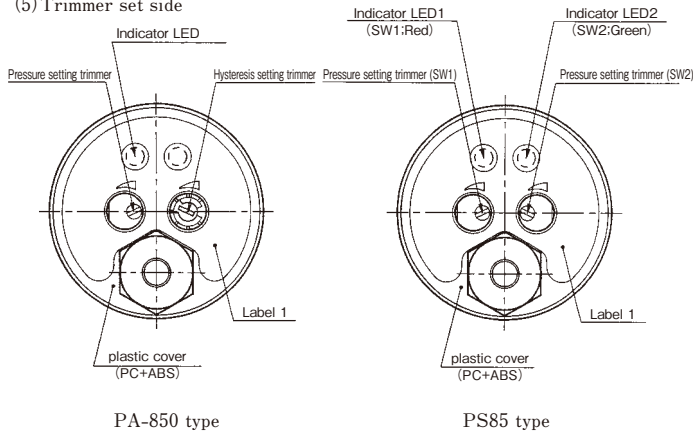
(3) PA-850/PS85, GF type



(4) PA-850/PS85, VC type



(5) Trimmer set side



6. SPECIFICATIONS

6.1 General specifications

| Item | Specification |
|-------------------------|----------------------------------------------|
| Maximum pressure | Double of rated pressure |
| Pressure Break-Down | Triple of rated pressure |
| Operating temp. range | -20~80°C |
| Compensated temp. range | 0~50°C |
| Operating humidity | 35~85%RH |
| Storage temp. range | -20~80°C |
| Media | Corrosive gases/liquids compatible with 316L |
| Enclosed liquid | Silicone oil |
| Protective structure | IP65 |
| Weight | Approx. 180g |

6.2 Power

| Item | Specification |
|---------------------|-----------------------------------|
| Operating voltage | 10.8~30VDC (Include ripple) |
| Current consumption | 20mA max. (No load, switch is ON) |

6.3 Switch output

| Item | Specification | | |
|-----------------------------|--------------------------------------------------|--------------------------------------------------|---------------------------------------------|
| | PA-850 | PS85 | |
| No. of outputs | 1 | 2 | |
| Output interface | Switching mode | Upper limit | (Upper, Upper limit) / (Upper, Lower limit) |
| | | NPN or PNP open collector | |
| Setting method | Adjustable trimmer | | |
| Setting range | 0 to 100% of rated pressure (0 to 108% for 102A) | | |
| Display (When output is ON) | Red LED lighted | Red LED lighted (SW1) Green LED lighted (SW2) | |
| | Accuracy | | |
| | ±3% F.S. | | |
| Hysteresis | About 1 to 15% of set point | Max. 2% F.S. | |
| Setting method of Hys. | By adjustable trimmer | Fixed | |
| Switching capacity | 30VDC 100mA max. (for each circuitry) | | |

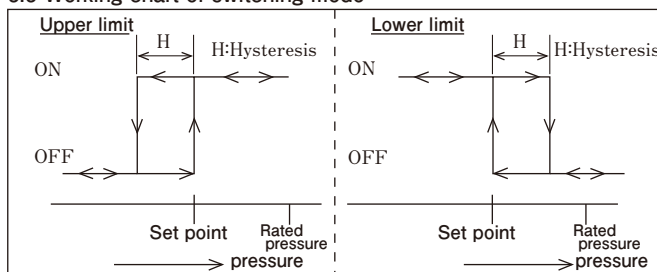
6.4 Analog Output (Only PA-850)

| Item | Specification | | |
|------------------------|------------------------------------|----------------|----------------------------|
| Pressure range | 102R | 302R | Except for the left ranges |
| Output voltage | 1~5 V | | |
| Zero Voltage | 3±0.1V | 2±0.1 V | 1±0.04V |
| Span Voltage | 4±0.1V (-100kPa to rated pressure) | | 4±0.04V |
| Linearity / Hysteresis | ±0.5% F.S. | | |
| Thermal error | Zero | ±0.06% F.S./°C | |
| | Span | ±0.06% F.S./°C | |

6.5 Preset type of pressure level point

| Item | Specification |
|------------------------|----------------------------|
| Switch output accuracy | ±1% of rated pressure Max. |

6.6 Working chart of switching mode



7. Warranty

Nidec Copal Electronics warrants the products for the period of one year after the date of the customer's receipt. We will repair the troubled products caused by our improper designing and/or production control at our cost. Our warranty is limited to the products only, not on another damage that is caused by the product malfunction.

Please note that the repairing cost resulted from the following matters are out of our responsibility.

- (1) Trouble and damage caused by mishandling or careless usage against the handling manual.
- (2) Trouble and damage caused by improper remodeling, adjustment or repair.
- (3) Trouble and damage caused by natural disaster, fire or any other irresistible force.
- (4) Replacement of maintenance or consumption parts. (e.g. O-ring).