

# Nidec

Pressure transducer with amp

## PA-850

Electronic pressure switch

## PS85

INSTRUCTION MANUAL Ver.3.0

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.

### NIDEC COMPONENTS CORPORATION

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Phone: +81-3-3364-7055 Fax: +81-3-3364-7098  
URL: <https://www.nidec-components.com>

## 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]

These products (pressure sensors, pressure switches, pressure gauges, pressure indicators, leakage sensors, etc.) are designed and manufactured as general industrial parts. Therefore, a person with sufficient knowledge and experience shall confirm the conditions and environments described in the catalog, specifications, and instruction manual of each product, check the suitability of the product for the machine, device, or system which you use, and ensure safety before use.

These products are not intended to be used for applications particularly requiring high reliability (These include, but are not limited to, nuclear power control, aerospace and military purposes).

The details of warranty shall be as per the descriptions in this document and we shall not be liable for any damage on you resulting from the use of any equipment or device (including control systems) which is not in accordance with this document (hereinafter referred to as "use in violation"). In the case where you resell our products, we shall not be liable for any damage on a third party resulting from use in violation by the third party, and even if we make payment to the third party in connection with such use in violation regardless of the name by which such payment may be called, we may demand the whole amount thereof from you.

### ⚠ 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.	Connection	
Wire's color	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.

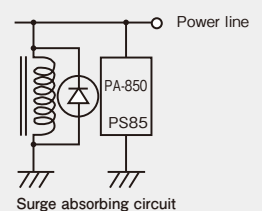
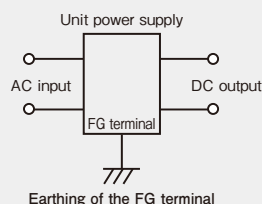
### ⚠ Caution

#### 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 on the right)

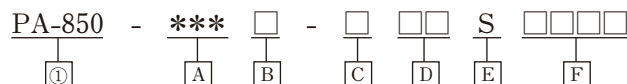
- (6) The top portion of the "VC" fitting is finished like a mirror surface. Handle the product so as not to damage it.
- (7) Do not touch or scratch the diaphragm at the edge of the fitting, as this may alter the performance characteristics or damage the diaphragm, and cause malfunctioning.



## 1. PART NUMBER DESIGNATION

### ◎ Pressure transducer with amp. / PA-850

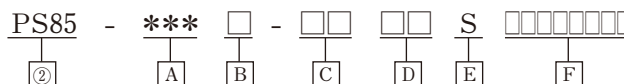
Analog voltage output (1~5V) + one switch output (adjustable hysteresis) type



※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]

302 : 300 [kPa]

352 : 350 [kPa]

103 : 1 [MPa]

B : Pressure reference

G : Gauge pressure

V : Vacuum pressure

A : Absolute pressure

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

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

①PA-850 series

N : NPN (Upper limit)

P : PNP (Upper limit)

②PS85 series

N1 : NPN (Upper, 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)

G2 : G1/4 (PF1/4)

GF : G3/8 (PF3/8)

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

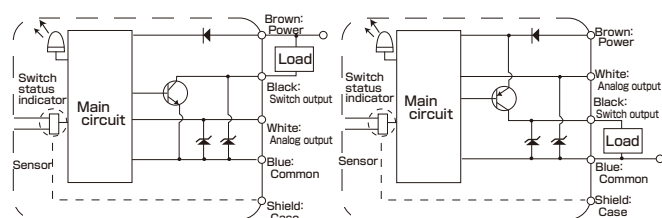
① Apply the pressure to turn on the switch 1 and get the switching point by adjusting the trimmer on the left. (Refer to 5(5)) (The Red LED lighted when the switch 1 is ON.)

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.)

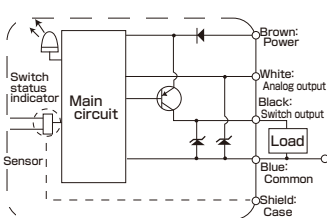
## 4. INTERNAL ELECTRICAL SCHEMATICS

(1) PA-850

NPN Output type

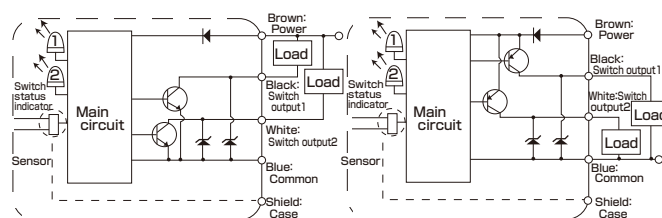


PNP Output type

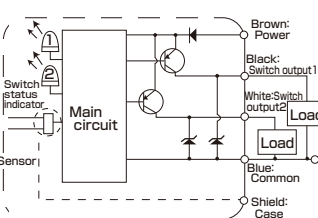


(2) PS85

NPN Output type

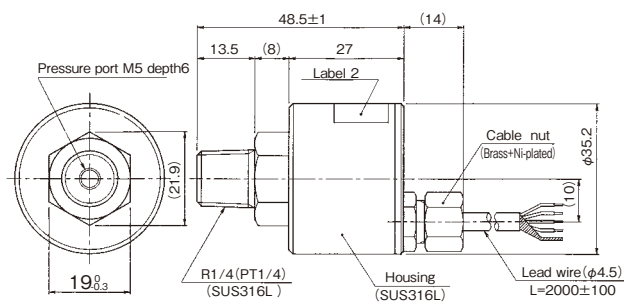


PNP Output type

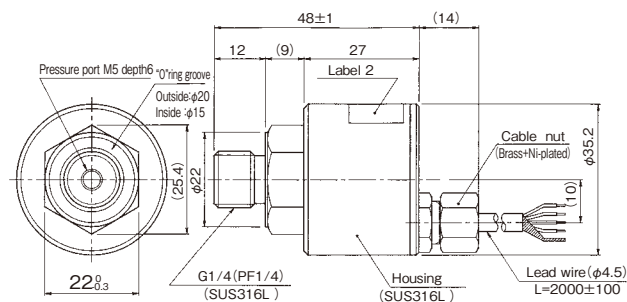


## 5. OUTLINE DIMENSIONS (unit : mm)

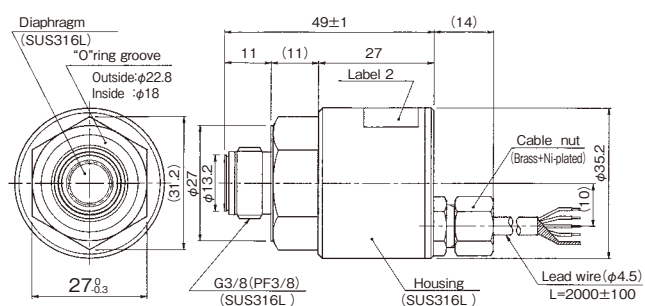
(1) PA-850/PS85, R2 type



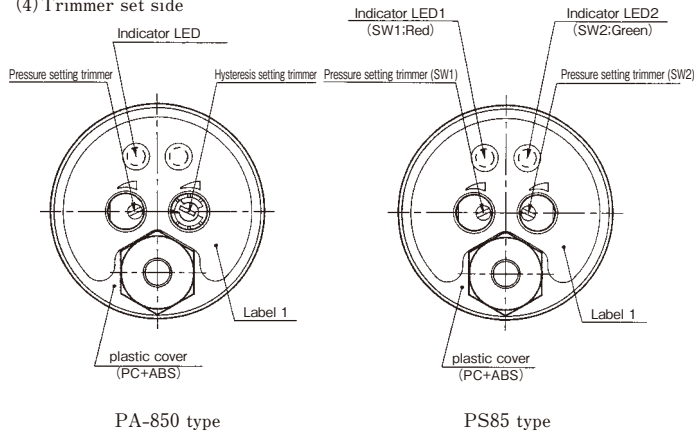
(2) PA-850/PS85, G2 type



(3) PA-850/PS85, GF type



(4) 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		$\pm 3\%$ 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)	

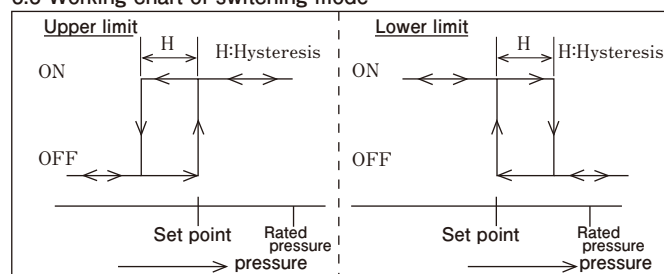
## 6.4 Analog Output (Only PA-850)

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

## 6.5 Preset type of pressure level point

Item	Specification
Switch output accuracy	$\pm 1\%$ of rated pressure Max.

## 6.6 Working chart of switching mode



# 7. WARRANTY AND DISCLAIMER

- 1) The warranty period of these products is one year after delivery to a designated place. The warranty mentioned here is limited to the warranty of a delivered product itself, and it does not cover consumables such as batteries. Each product has its own specifications such as durability (pressure cycles). Therefore, check with each service office.
- 2) If a failure or damage of the product occurs during the warranty period, for which we are responsible, we will promptly replace or repair the product free of charge. The warranty mentioned here means the warranty of the product itself and does not cover any damage induced by a failure of the product.
- 3) The warranty does not cover when any of the following items is applicable:
  - The failure is caused by conditions, environments, or handling not described in the catalogue and agreed specifications and other documents.
  - The product has been modified, adjusted, or repaired by a person/company other than our company after delivery.
  - The failure cannot be foreseen by the scientific and technological knowledge at the time of delivery.
  - The failure is caused by force majeure such as disasters.