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# COPAL ELECTRONICS

## Pressure Switch

# PS83 series

Instruction Manual Ver. 2.2

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.

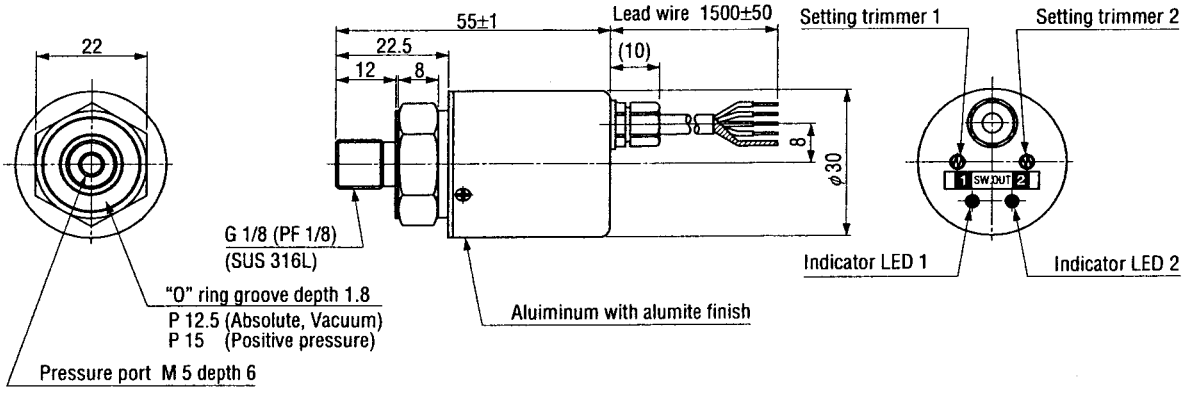
## [Overview]

The PS83 series pressure switches are solid-state pressure switches consisting of a semiconductor type pressure transducer and electronic circuits which turn on and off according to a preset pressure value. Since the pressure sensing section adopts the stainless double diaphragm structure with high corrosion resistance, the PS83 dispenses mechanical sections, ensuring high-speed responses and long life. In addition, the PS83 has two switch outputs, which allow the operating pressure to be set separately.

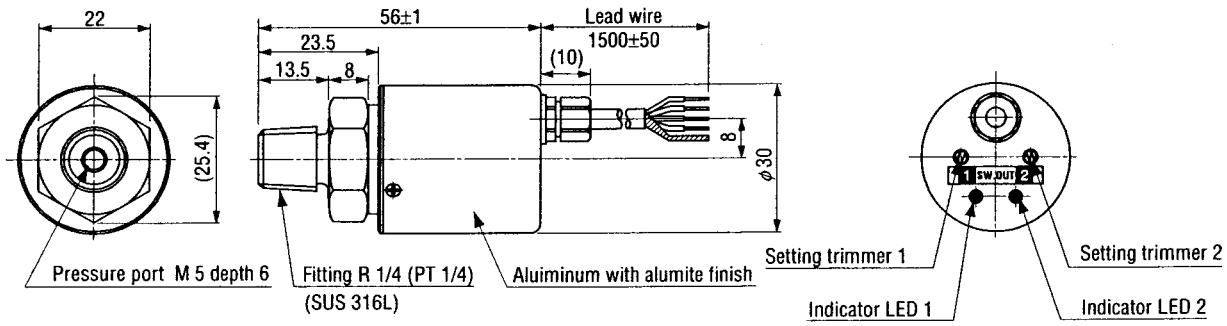
## [Outline Dimensions]

Unless otherwise specified, tolerance : ± 0.5 (Unit: mm)

● PS83 (G 1/8 type)




● PS83 (R2 type)



Unless otherwise specified, tolerance : ± 0.5 (Unit: mm)

● PS83 (VCR type)

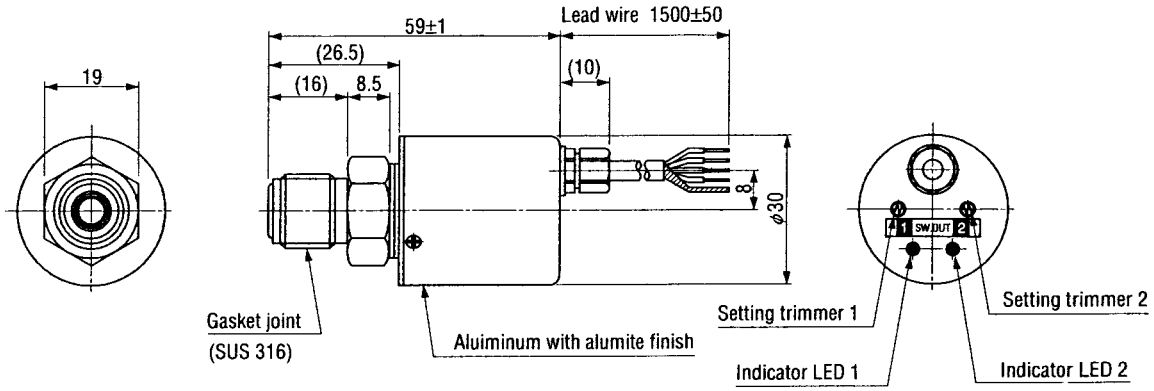



Table 1. Connection of the cables

| Wire color | Connection |
|---|---|
| Red | Power (+) |
| Green | Output 1 |
| White | Output 2 |
| Black | Common |
| Shield | Housing |

## [Specifications]

1. Pressure reference : Gauge / Absolute
2. Media : Corrosive gases/Liquids compatible with SUS316, SUS316L
3. Operating temperature : -20℃ to +70℃
4. Storage temperature : -20℃ to +70℃
5. Supply voltage : 12 to 24V DC±10%
6. Current consumption : 20mA
7. Rated pressure range and Maximum pressure

Unit : kPa(kgf/cm$^2$)

| Part Number | Rated pressure range | Maximum pressure |
|---|---|---|
| PS83-501G | 0 to 49.0 (0 to 0.5) | 98.1 (1) |
| PS83-102G | 0 to 98.1 (0 to 1.0) | 196 (2) |
| PS83-352G | 0 to 343 (0 to 3.5) | 686 (7) |
| PS83-103G | 0 to 981 (0 to 10) | 1961 (20) |
| PS83-102V | -98.1 to 0 (-1.0 to 0) | 196 (2) |
| PS83-351A | 0(abs.) to 34.3 (0 to 0.35) | 103 (1.05) |
| PS83-102A | 0(abs.) to 98.1 (0 to 1.0) | 196 (2) |

8. Switch output
   Number of output : 2
   Output interface : NPN open collector output
   Setting method : Adjustable by trimmer pot.
   Adjustable range : 0 through rated pressure
   Accuracy : ±3% F.S.(0 to 50℃, reference temp. 20℃)
   Hystresis : 2% F.S. max.
   Switching capacity : 30V DC 80mA max.
   Residual voltage : 0.8V max.
   Response : Approx. 2ms.

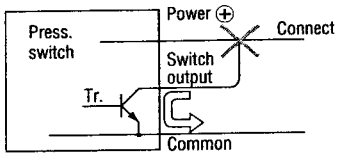
## [Operations]

(1) 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 cable.
(2) Fit up the gauge or manometer in the pressure line and apply the pressure you desire the switch to be turned on. If the switch output were "ON" (LED lighted) at this moment, turns the trimmer potentiometer gently clockwise (CW) to the point the output turns "OFF" (LED lights out) and stop turning the trimmer potentiometer. If the switch output were "OFF" (LED lights out) at this time, to the contrary, turn the trimmer potentiometer gently counterclockwise (CCW) to the point the output turns "ON" (LED lights up) and stop turning. Repeat these procedures for several times and get the optimum set point.

## [Notes on Handling]

(1) The PS83 is used the tree-turn trimmer potentiometer for switch setting device. Use the small screw driver with appropriate bit size and turn the trimmer potentiometer gently when setting the switch output.
(2) Since the shield wire has electrical contact with the pressure port and the metal portion of the product, it is recommended to connect it to the common terminal (Black lead wire) in many cases.
(3) Make sure that there are no wiring errors once again before turning on the power. If the switch outputs (Green and/or White lead wire) shorted to the power line, output transistors would be damaged (See fig.1)
(4) If surge voltage rushed in the power line or the load line, the product would malfunction or the internal circuitry might be damaged. Surge voltage absorption circuits should be connected to the devices, such as relays or electromagnetic valves, that may induce surges. (See fig.2)
(5) Since the PS83 is not of the drip-proof structure, it cannot be used under the environment where liquid potentially drips. Also, condensation caused by abrupt temperature change or freeze inside the pressure port (at the time of water pressure measurement) may be caused failures.
(6) In the case of double stainless diaphragm type, please avoid contact with the diaphragm and damage the sensor. Also care must be taken not to put foreign matter on the surface of the diaphragm. Since the tip of the joint of the VCR® fitting is mirror-finished, be careful not to damage it.

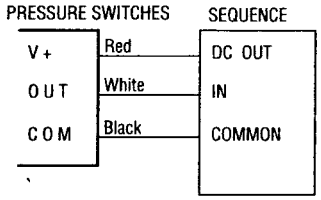
(NPN open collector type)




( fig.1 )

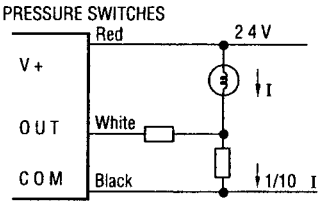
### ● Connection with a sequence controller

The switch output can be directly connected to the non-contact input terminal of the sequence controller. The switch can make use of the sensor power supply from the sequence controller.



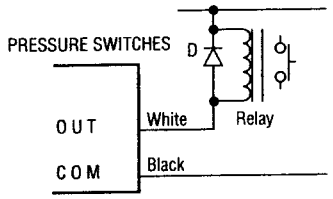

### ● Load current

A lamp load or like that may cause excessive current flow and requires the proper preventive measure.



### ● Connection with a small size relay or a solenoid

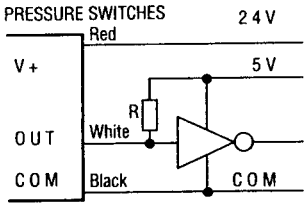
Practically the switch can directly drive a small size, 1 W class, relay or a similar wattage solenoid at 24 V. Back voltage profection must be prepared.




D : Back voltage protection circuit

### ● Connection with TTL or CMOS

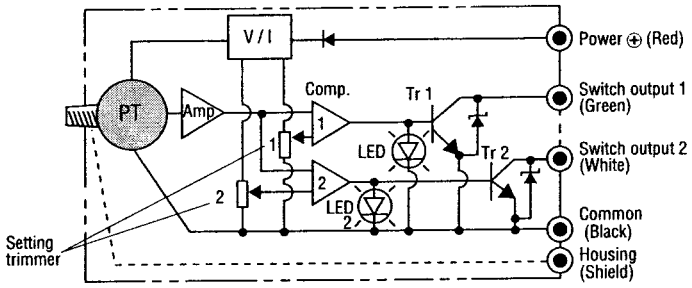
Due to the employment of the open collector configuration, a pull-up resistor is required.



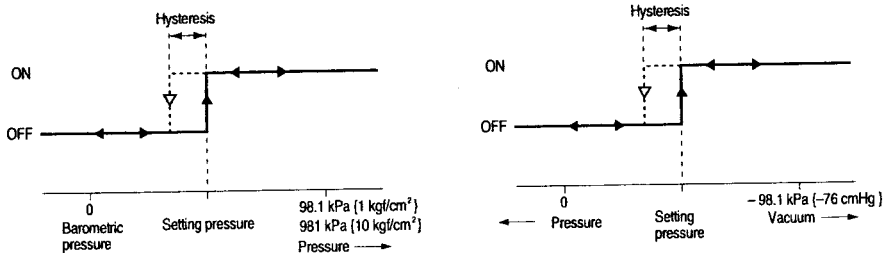

R : 4.7 kΩ (TTL)
20 kΩ (C-MOS)

( fig.2 )

## ■ INTERNAL ELECTRICAL SCHEMATICS




## ■ SWITCH OUTPUT SCHEMATICS




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This product is covered by a warranty for a period of one year from the date of delivery. 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.

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2) Failures or damages occurring through improper modification, adjustment, or repair.
3) Failures or damages occurring through natural calamities, fires or other inevitable accidents.
4) Replacement of accessories (e.g. O-ring rubber, etc.)

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

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