

# COPAL ELECTRONICS

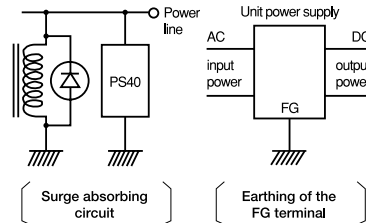
## ELECTRONIC PRESSURE SWITCH PS40

CE marking  
(Compliance with EMC Standards)  
INSTRUCTION MANUAL Ver.2.1

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. Also, please keep this manual and read again as necessary.

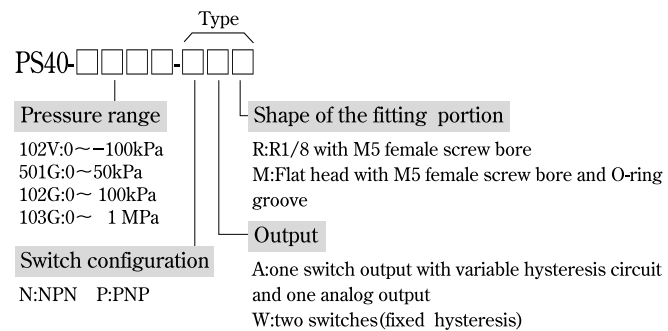
### IMPORTANT INFORMATION and CAUTION

- 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.
- Never apply corrosive gases nor liquids for pressure media.
- Never take in the over-pressure exceeding the maximum pressure.
- Never short-circuit the switch output to the other terminals, nor them connect to the low impedance load that would allow the output current over 80mA. These conduct might damage the internal circuitry.
- Use the stable DC power supply for the power source. Surge absorbing circuit (diodes, varistor, etc.) is necessary if inductive load such as relay or solenoid was connected to the power line and/or to the switch output(s). FG terminal on the unit power supply should be earthed. (Refer the diagrams.)
- When handling the product, be sure to pick up the body and not to give the excessive force to the cable.
- Use the neutral detergent when cleaning the body, also do not use the solvents like lacquer thinner.



### 1. PART NUMBER DESIGNATION

Please confirm the part number of the product you purchased.

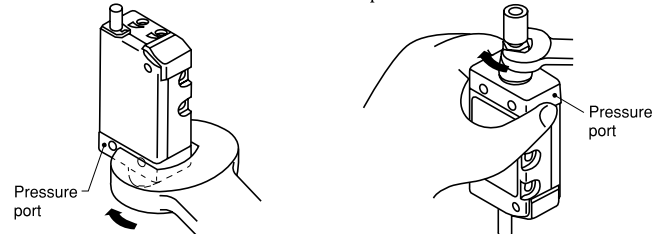


### 2. ACCESSORIES

Pan head small screws and spring lock washers...2pcs each  
Screw driver for adjustment .....1pc

### 3. PIPING

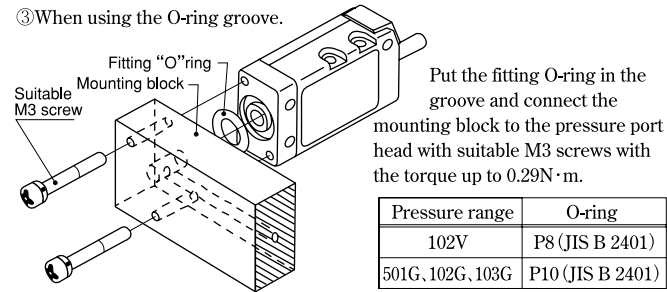
- When using the R1/8 fitting part
- When using M5 female screw bore part



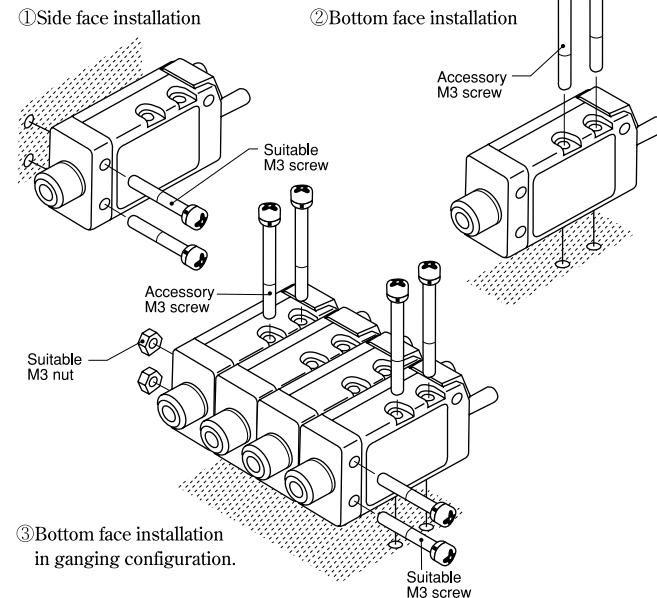
Hold the pressure port block and wrench up the suitable fitting with the torque of up to 4.9N·m. Be sure not to wrench the other portion except the pressure port block. Use the sealing tape if necessary.

Support the pressure port block and wrench up the suitable fitting with the torque of up to 0.49N·m. Be sure that pressure port block is the only portion to be hold when piping.

**CAUTION** Never tighten the PS40 with holding the main body. This may physically break the switch or affect its performance characteristics.



### 4. INSTALLATION OF THE MAIN BODY



### 5. WIRING

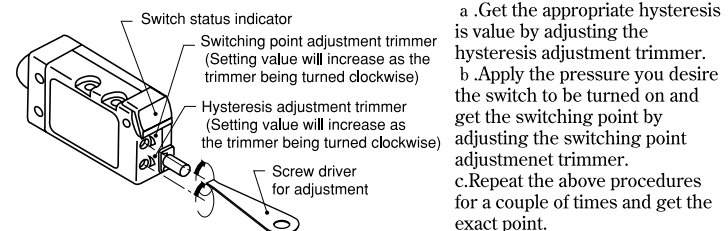
Wiring connection must be done as instructed below without fail.

| ① Type NAR, NAM, PAR and PAM |              | ② Type NWR, NWM, PWR and PWM |              |
|------------------------------|--------------|------------------------------|--------------|
| Color                        | Connection   | Color                        | Connection   |
| Brown                        | Power supply | Brown                        | Power supply |
| Blue                         | G N D        | Blue                         | G N D        |
| Black                        | Switch out   | Black                        | Switch out 1 |
| White                        | Analog out   | White                        | Switch out 2 |

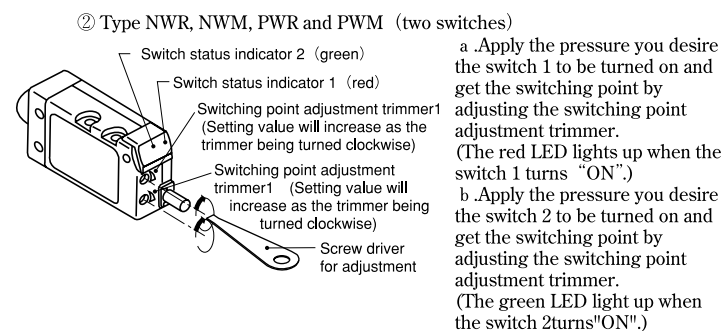
**CAUTION** Never short-circuit the switch output(s) to the other terminals, nor then connect to the low impedance load that would allow the output current over 80mA. These conduct might damage the internal circuitry.

### 6. SETTING

- Type NAR, NAM, PAR and PAM (one switch)
- Type NWR, NWM, PWR and PWM (two switches)



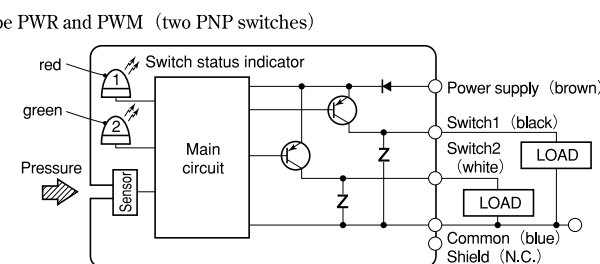
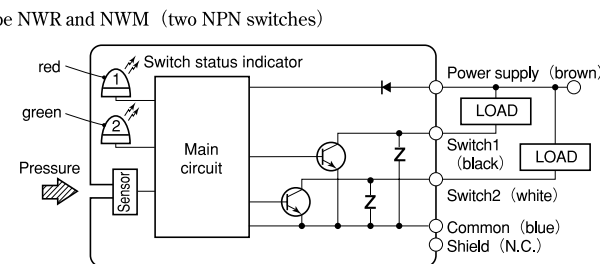
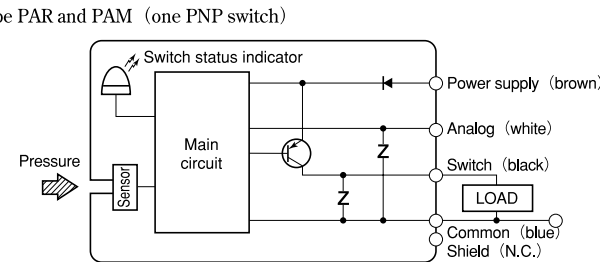
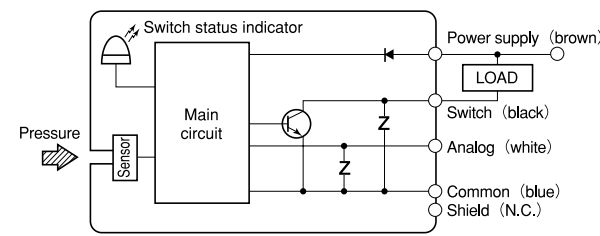
**CAUTION** Be aware of not applying too much force to the trimmers. The applying torque to the hysteresis adjustment trimmer should be up to 0.044N·m.



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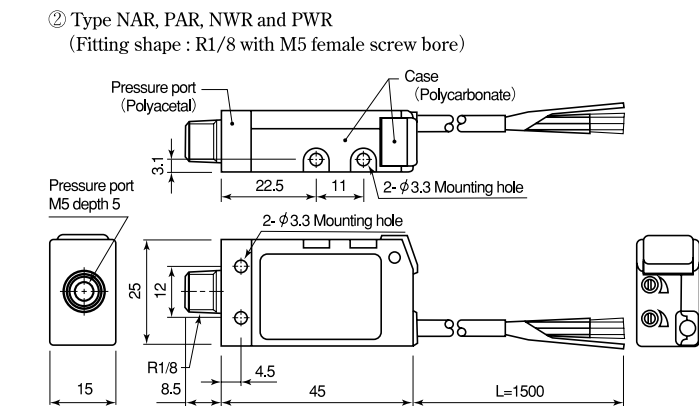
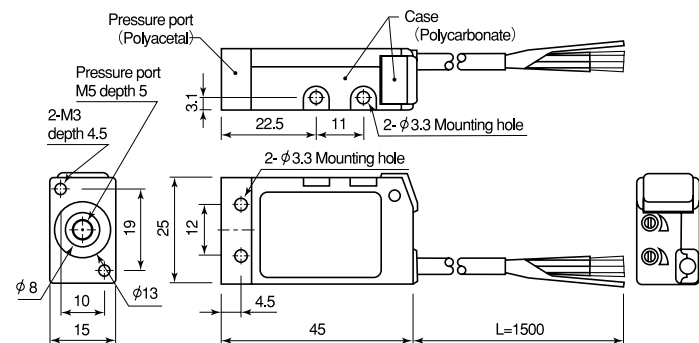
### 7. INTERNAL ELECTRICAL SCHEMATICS

- Type NAR and NAM (one NPN switch)
- Type PAR and PAM (one PNP switch)
- Type NWR and NWM (two NPN switches)
- Type PWR and PWM (two PNP switches)



### 8. OUTLINE DIMENSIONS

- Type NAM, PAM, NWM and PWM (Fitting shape: Flat head with M5 female screw bore and O-ring groove)
- Type NAR, PAR, NWR and PWR (Fitting shape: R1/8 with M5 female screw bore)



### 9. MAJOR SPECIFICATIONS

- General specifications
 

|                        |   |
|------------------------|---|
| Pressure reference     | Gauge (Referring to atmospheric pressure) |
| Pressure media         | Non-corrosive gases                       |
| Operating temp.range   | -20~70°C                                  |
| Storage temp.range     | -20~80°C                                  |
| Compensated temp.range | 0~50°C                                    |

| pressure range   | 102V   | 501G   | 102G   | 103G   |
|------------------|--------|--------|--------|--------|
| Rated pressure   | 100kPa | 50kPa  | 100kPa | 1MPa   |
| Maximum pressure | 200kPa | 100kPa | 200kPa | 1.5MPa |

- Power supply
 

|                   |             |
|-------------------|-------------|
| Operating voltage | 10.8~30V DC |
|-------------------|-------------|

| Item                | Type | NAR, NAM                           | PAR, PAM | NWR, NWM                             | PWR, PWM |
|---------------------|------|------------------------------------|----------|--------------------------------------|----------|
| Current consumption |      | 17mA or less (No load switch "ON") |          | 25mA or less (No load switches "ON") |          |

- Switch

| Item           | Type             | NAR, NAM   | PAR, PAM                                | NWR, NWM                               | PWR, PWM                                |
|----------------|------------------|--|---|--|---|
| Setting Method | Range            | 0~100% of the rated pressure                                     |   |  |   |
|                | Method           | Adjustable with the 3-turn trimmer (s)                           |   |  |   |
|                | No. of switches  | 1  |   | 2                                      |   |
|                | Hysteresis       | Adjustable, about 1~15% of the set value with the 1-turn trimmer |   | Fixed, 2%FS or less                    |   |
|                | Working chart    |  |   |  |   |
|                | Rating           | 30V 80mA or less   | 80mA or less                            | 30V 80mA or less                       | 80mA or less                            |
|                | Residual voltage | 0.8V max. at flow-in current load 80mA                           | 1.2V max. at flow-out current load 80mA | 0.8V max. at flow-in current load 80mA | 1.2V max. at flow-out current load 80mA |
|                | Accuracy         | ±3%FS or less (0~50°C reference temp. 25°C)                      |   |  |   |

- Analog output (1~5V)

| Item                 | Type | NAR, NAM  | PAR, PAM |
|----------------------|------|---|----------|
| ZERO voltage         |      | 1±0.1V  |          |
| SPAN voltage         |      | 4±0.1V  |          |
| Output current       |      | 1mA or less<br>Resistance should be 5kΩ or more |          |
| Thermal error        | ZERO | 0.1%FS/°C or less                               |          |
|                      | SPAN | 0.1%FS/°C or less                               |          |
| Linearity/Hysteresis |      | ±0.5%FS or less                                 |          |

- EMC
 

|                                  |
|----------------------------------|
| EN55011 : 1998 (Group1, Class A) |
| EN60947-1 : 1997                 |
| Accuracy : ±5%FS                 |

### 10. 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.

- Trouble and damage caused by mishandling or careless usage against the handling manual.
- Trouble and damage caused by improper remodeling, adjustment or repair.
- Trouble and damage caused by natural disaster, fire or any other irresistible force.
- Replacement of maintenance or consumption parts.

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

# COPAL ELECTRONICS

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