ELECTRONIC PRESSURE SWITCH

PS40

CE marking
(Compliance with EMC Standards) UKCA

INSTRUCTION MANUAL Ver.4.0

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

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

NIDEC COMPONENTS CORPORATION

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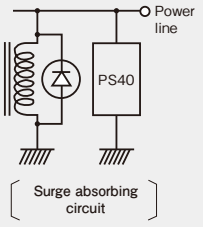
⚠ IMPORTANT INFORMATION and CAUTION

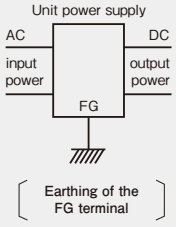
【CAUTION】

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.

①The 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.
②Never apply corrosive gases nor liquids for pressure media.
③Never take in the over-pressure exceeding the maximum pressure.
④Never 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 damege the internal circuitry.
⑤Use 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.)
⑥When handling the product, be sure to pick up the body and not to give the excessive force to the cable.
⑦Use the neutral detergent when cleaning the body, also do not use the solvents like lacquer thinner.



Surge absorbing circuit



Earthing of the FG terminal

1. PART NUMBER DESIGNATION

Please confirm the part number of the product you purchased.

PS40-□□□□-□□□ (Type)

Pressure range
102V : 0～−100kPa
501G : 0～50kPa
102G : 0～100kPa
103G : 0～1 MPa

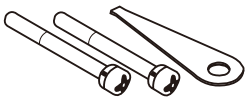
Switch configuration
N : NPN P : PNP

Shape of the fitting portion
R : R1/8 with M5 female screw bore
M : Flat head with M5 female screw bore and O-ring groove

Output
A : one switch output with variable hysteresis circuit and one analog output
W : two switches (fixed hysteresis)

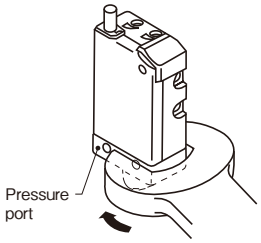
2. ACCESSORIES

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



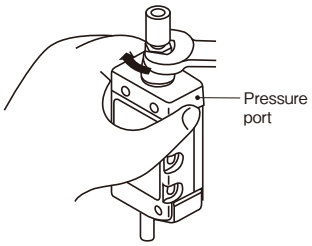
3. PIPING

①When using the R1/8 fitting 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.

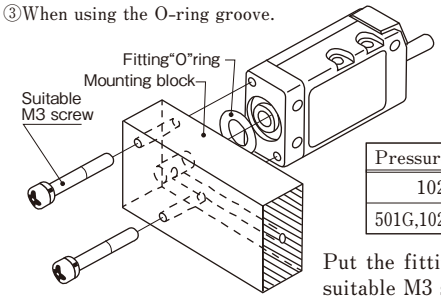
②When using M5 female screw bore part



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.

③When using the O-ring groove.

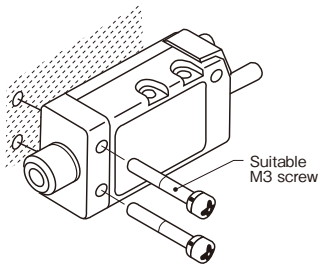


Pressure range	O-ring
102V	P8 (JIS B 2401)
501G,102G,103G	P10 (JIS B 2401)

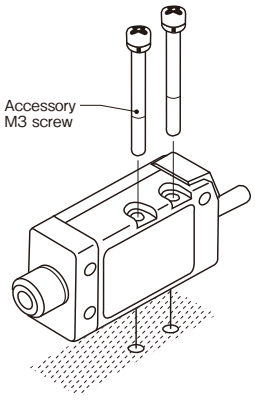
Put the fitting O-ring in the groove and connect the mounting block to the pressure port head with suitable M3 screws with the torque up to 0.29N・m.

4. INSTALLATION OF THE MAIN BODY

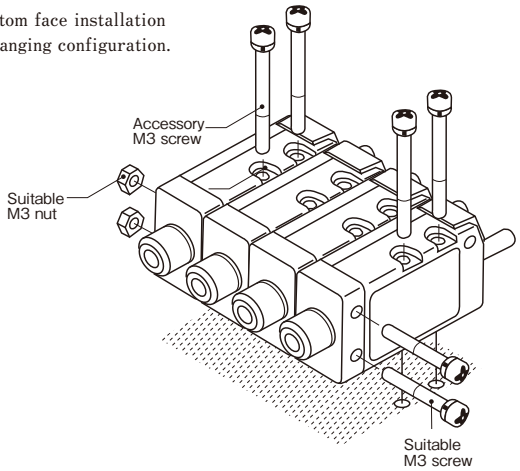
①Side face installation



②Bottom face installation



③Bottom face installation in ganging configuration.



5. WIRING

Wiring connection must be done as instructed below without fail.

①Type NAR, NAM, PAR and PAM

Color	Connection
Brown	Power supply
Blue	Common
Black	Switch out
White	Analog out

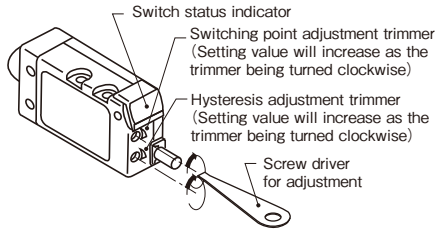
②Type NWR, NWM, PWR and PWM

Color	Connection
Brown	Power supply
Blue	Common
Black	Switch out 1
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

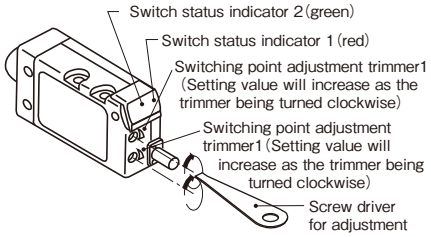
①Type NAR, NAM, PAR and PAM (one switch)



a.Get the appropriate hysteresis is value by adjusting the hysteresis adjustment trimmer.
b.Apply the pressure you desire the switch to be turned on and get the switching point by adjusting the switching point adjustmenet trimmer.
c.Repeat the above procedures for a couple of times and get the exact point.

⚠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.

②Type NWR, NWM, PWR and PWM (two switches)

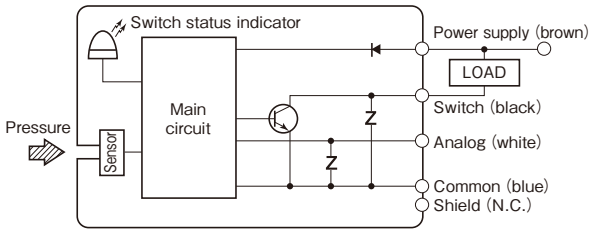


a.Apply the pressure you desire the switch 1 to be turned on and get the switching point by adjusting the switching point adjustment trimmer.
(The red LED lights up when the switch 1 turns"ON".)
b.Apply the pressure you desire the switch 2 to be turned on and get the switching point by adjusting the switching point adjustment trimmer.
(The green LED light up when the switch 2turns"ON".)

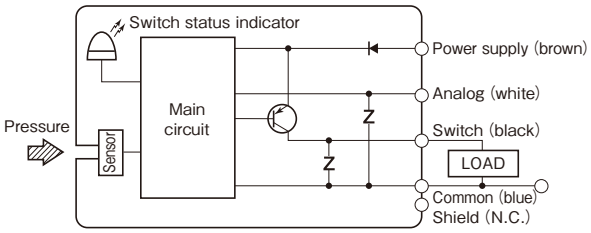
⚠CAUTION Be aware of not applying too much force to the trimmers.

7. INTERNAL ELECTRICAL SCHEMATICS

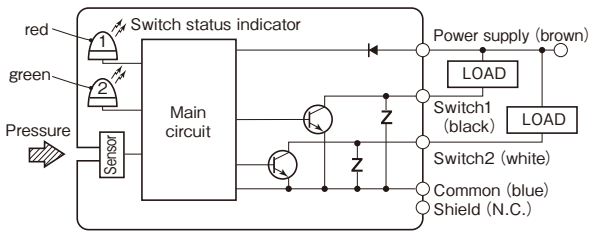
①Type NAR and NAM (one NPN switch)



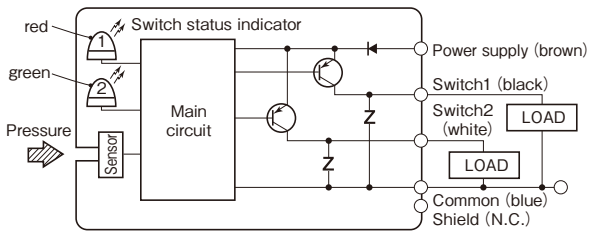
②Type PAR and PAM (one PNP switch)



③Type NWR and NWM (two NPN switches)

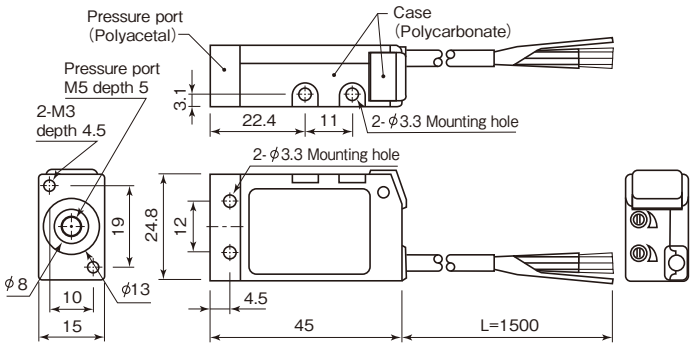


④Type PWR and PWM (two PNP switches)

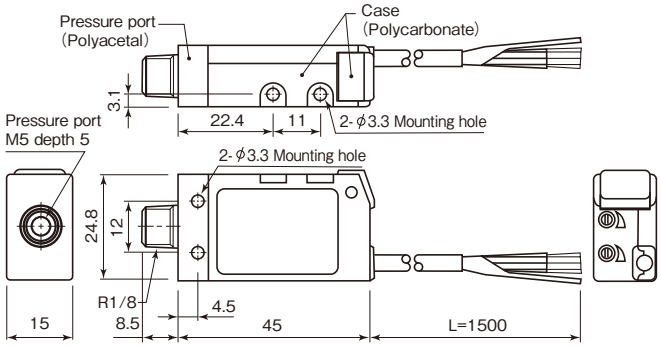


8. OUTLINE DIMENSIONS

①Type NAM, PAM, NWM and PWM
(Fitting shape : Flat head with M5 female screw bore and O-ring groove)



②Type NAR, PAR, NWR and PWR
(Fitting shape : R1/8 with M5 female screw bore)



9. MAJOR SPECIFICATIONS

①General specifications

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

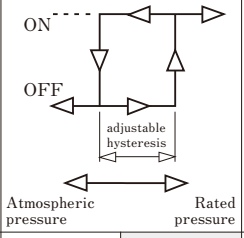
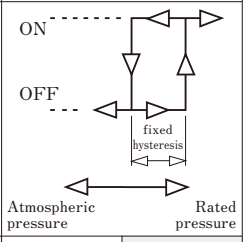
Item \ pressure range	102V	501G	102G	103G
Rated pressure	−100kPa	50kPa	100kPa	1MPa
Maximum pressure	200kPa	100kPa	200kPa	1.5MPa

②Power 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”)	

③Switch

Item \ Type		NAR、NAM	PAR、PAM	NWR、NWM	PWR、PWM
Setting	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℃ reference temp. 25℃)			

④Analog output (1～5V)

Item \ Type	NAR、NAM	PAR、PAM
ZERO voltage	1±0.1V	
SPAN voltage	4±0.1V	
Output current	1mA or less Resistance should be 5kΩ or more	
Thermal error	ZERO 0.1%FS/℃ or less	
	SPAN 0.1%FS/℃ or less	
Linearity/Hysteresis	±0.5%FS or less	

※Type NWR·NWM· PWR and PWM don't have the analog output.

10. 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.