

INSTRUCTION MANUAL

ITEM : EXPLOSIONPROOF PRESSURE / DIFFERENTIAL PRESSURE SWITCH

ITEM : P953 / P970



WISE[®] WISE Control Inc.
www.wisecontrol.com

Instructions for proper and safe operation

For the right use and safety of this product, please read through this manual prior to use.

Handling error may cause device trip, injury, or disaster.

WARNING

1. Do not impose excessive pressure beyond the allowance.

2. Do not use corrosive measuring fluid.

This may cause pressure measuring element damage or rupture, resulting in measuring spill, eventually human injury or surrounding destruction.

3. Avoid excessive load, vibration, or shock. The glass tube may be broken.

This may cause product damage or rupture to spill measuring fluid, resulting in human injury or surrounding destruction.

4. Keep the working temperature range. (-20 ~ 60°C)

In excess of the working temperature range, the pressure switch may be broken or damaged to destroy the surroundings.

5. Use the device within the rated in/out value as written in the specification.

Otherwise, the device may fall in trouble.

6. Both ends of a cable shall be the solderless terminal coated with an insulator.

7. The cable gland shall have the specified explosionproof grade or equivalent.

8. As for wiring, follow the internal wiring rules and the electric facility technology standard.

9. To detach the pressure switch, be sure to close the valve to block the measuring fluid.

Measuring fluid spillage may destroy the surroundings.

10. When you are using oxygen for the measuring fluid, rely on the Use No Oil manometer.

Any oil residue in an ordinary product may react with oxygen, causing fire or explosion.

11. During site installation, be sure to follow this manual.

12. Do not modify the product by all means.

Be sure to consult with us prior to repair.

13. Before you open the product case for installation, be sure to shut off the power beforehand.

Wiring while current is flowing may cause electric shock. Be sure to shut off the power beforehand.

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1. Introduction

This is a pressure and differential switch equipped with a micro switch.

The switch is composed of pressure sensor, setting value and incoming pressure controller, and contact output micro switch.

Before you use this product, please read through this manual for correct use of each device.

2. Application

On reaching a set pressure, this product can be used for process control, abnormality notice, or warning on the basis of the On/Off signal. In addition, due to the pressure resistant and explosionproof structure, it can be installed in explosionproof areas.

3. Features

- 1) The pressure switch is the most suitable for simultaneous use of pressure indication and switching.
- 2) It can be used for explosionproof or hazardous area.
- 3) A micro switch is useful for stable open or close due to its snap action.

4. Warranty

We are not liable for any damage or failure of this product which was caused by your own modification, change, or repair against this manual and the warranty will be no longer valid.

5. Specification and Standards

- 1) Main Spec.

| | |
|-----------------------|--|
| Liquid Contact Part | : ASTM A279 316L, ASTM A240 316L |
| Case | : Cast Aluminum (ASTM B179 SC102A) |
| Painting | : Silver |
| Repeatability | : ± 1.0 % of Adjustable Range |
| Working Temp. | : -20 ~ 60°C |
| No. of Contact Points | : 1 x SPDT or 1 x DPDT (independent operation) |

Electrical properties

| Rated voltage | | Withstand voltage | Insulation resistance |
|-----------------|----------------|---|---|
| Resistance load | Inductive load | | |
| 125V AC 15A | 125V AC 15A | 1500V AC, 50/60Hz one minute (Between each terminal and case) | 100MΩ or more on 500VDC (Between each terminal and case) |
| 250V AC 15A | 250V AC 15A | | |
| 30V DC 2A | 30V DC 1A | | |
| 125V DC 0.5A | 125V DC 0.05A | | |
| 30V DC 2A | 30V DC 1A | (Between each terminal and case) | 100MΩ 이상 (Between each terminal and case) |
| 125V DC 0.5A | 125V DC 0.05A | | |

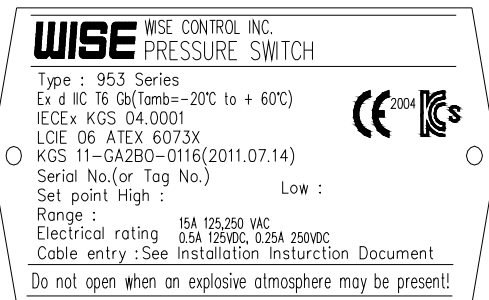
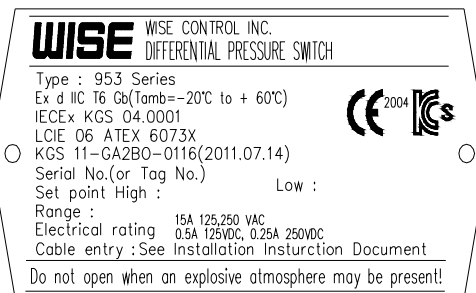
Measuring Pressure Range and Folded Terminal Gap

| ADJUSTABLE SETTING RANGE | | DEAD BAND | | OVER RANGE | | |
|-----------------------------|--------------|--|---|--------------------------------|-------------|-----|
| | | ONE SPDT SET POINT | TWO SPDT SET POINT | PROOF RANGE | BURST RANGE | |
| bar | kPa | mmH ₂ O(bar) | | | | bar |
| 0.003~0.07 | 0.3~7 | Within 5% of Adjustable Range | Within 10% of Adjustable Range | 150% of Adjustable Range | 35 | 3.5 |
| 0.027~0.15 | 2.7~15 | | | | | |
| 0.045~0.3 | 4.5~30 | | | | | |
| 0.075~0.5 | 7.5~50 | | | | | |
| 0.09~0.6 | 9~60 | | | | | |
| 0.12~0.8 | 12~80 | | | | | |
| 0.15~1 | 15~100 | | | | | |
| 0.3~2 | 30~200 | | | | | |
| 0.45~3 | 45~300 | | | | | |
| 0.9~6 | 90~600 | | | | | |
| 1.5~10 | 0.15~1MPa | | | | | |
| 2.25~15 | 0.225~1.5MPa | | | | | |
| 3~20 | 0.3~2MPa | | | | | |
| 4.5~30 | 0.45~3MPa | | | | | |
| 7.5~50 | 0.75~5MPa | | | | | |
| 8.5~70 | 0.85~7MPa | | | | | |
| 10.5~100 | 1.05~10MPa | | | | | |
| 15.5~150 | 1.55~15MPa | | | | | |
| 20~200 | 2~20MPa | | | | | |
| | | | | | 70 | 7 |
| | | | | | 170 | 17 |
| | | | | | 200 | 20 |
| | | | | | 400 | 40 |

Differential Pressure Range and Folded Terminal Gap

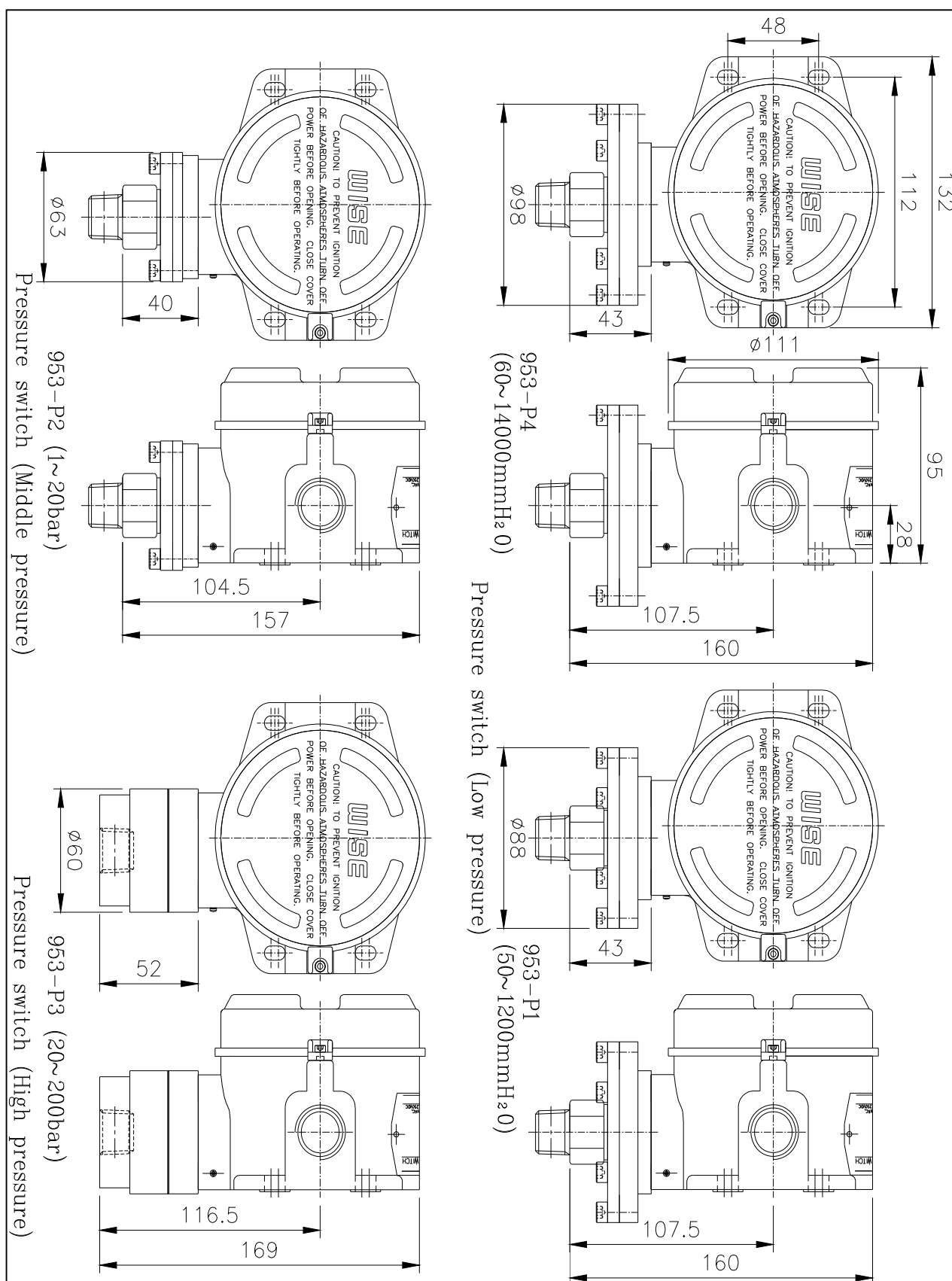
| ADJUSTABLE SETTING RANGE | | OVER RANGE | |
|--------------------------|------------|-------------------------|----------------|
| | | STATIC WORKING PRESSURE | PROOF PRESSURE |
| kPa | Mpa | Mpa | Mpa |
| 1 ~ 15 | | 0.1 | 0.15 |
| 15 ~ 25 | | 0.1 | 0.15 |
| 25 ~ 35 | | 0.1 | 0.15 |
| 35 ~ 50 | | 0.1 | 0.15 |
| | 0.05 ~ 0.2 | 2 | 15 |
| | 0.2 ~ 0.4 | 2 | 15 |
| | 0.4 ~ 0.7 | 2 | 15 |
| | 0.7 ~ 1.5 | 4 | 20 |

2) Nameplate

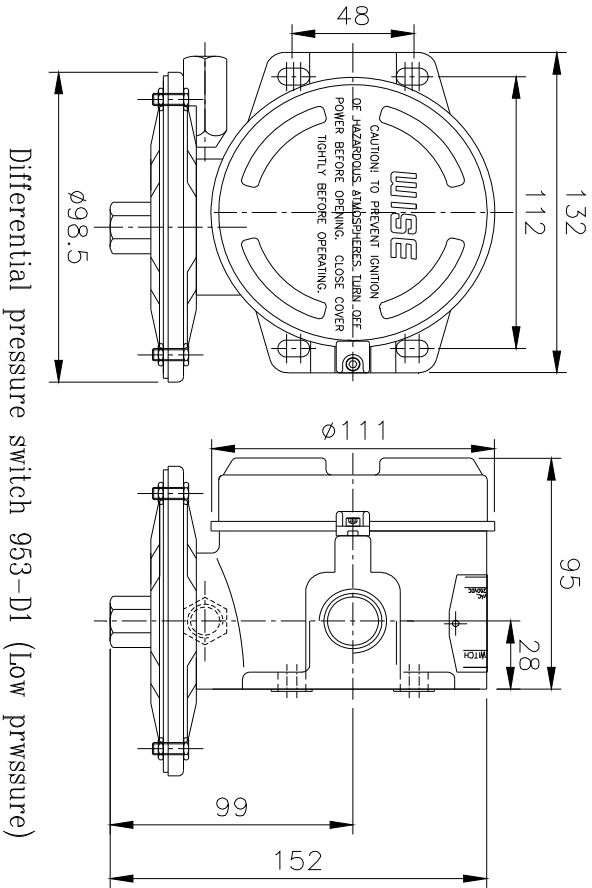
| P953 | P970 |
|---|---|
|  <p>WISE WISE CONTROL INC. PRESSURE SWITCH</p> <p>Type : 953 Series Ex d IIC T6 Gb(Tamb=-20°C to + 60°C) IECEX KGS 04.0001 LCIE 06 ATEX 6073X KGS 11-GA2B0-0116(2011.07.14) Serial No.(or Tag No.) Set point High : Low : Range : Electrical rating 15A 125,250 VAC 0.5A 125VDC, 0.25A 250VDC Cable entry : See Installation Instruction Document Do not open when an explosive atmosphere may be present!</p> |  <p>WISE WISE CONTROL INC. DIFFERENTIAL PRESSURE SWITCH</p> <p>Type : 953 Series Ex d IIC T6 Gb(Tamb=-20°C to + 60°C) IECEX KGS 04.0001 LCIE 06 ATEX 6073X KGS 11-GA2B0-0116(2011.07.14) Serial No.(or Tag No.) Set point High : Low : Range : Electrical rating 15A 125,250 VAC 0.5A 125VDC, 0.25A 250VDC Cable entry : See Installation Instruction Document Do not open when an explosive atmosphere may be present!</p> |
| <ol style="list-style-type: none"> Type (Type : 953 Series) Explosionproof Grade (Ex d IIC T6) Working Temp. (Tamb=-20°C to +60°C) Tag No. (Serial No.(or Tag No.)) Warning Notice (Do not open when an explosive atmosphere may be present!) Set Pressure (Range) | |

3) External Dimension

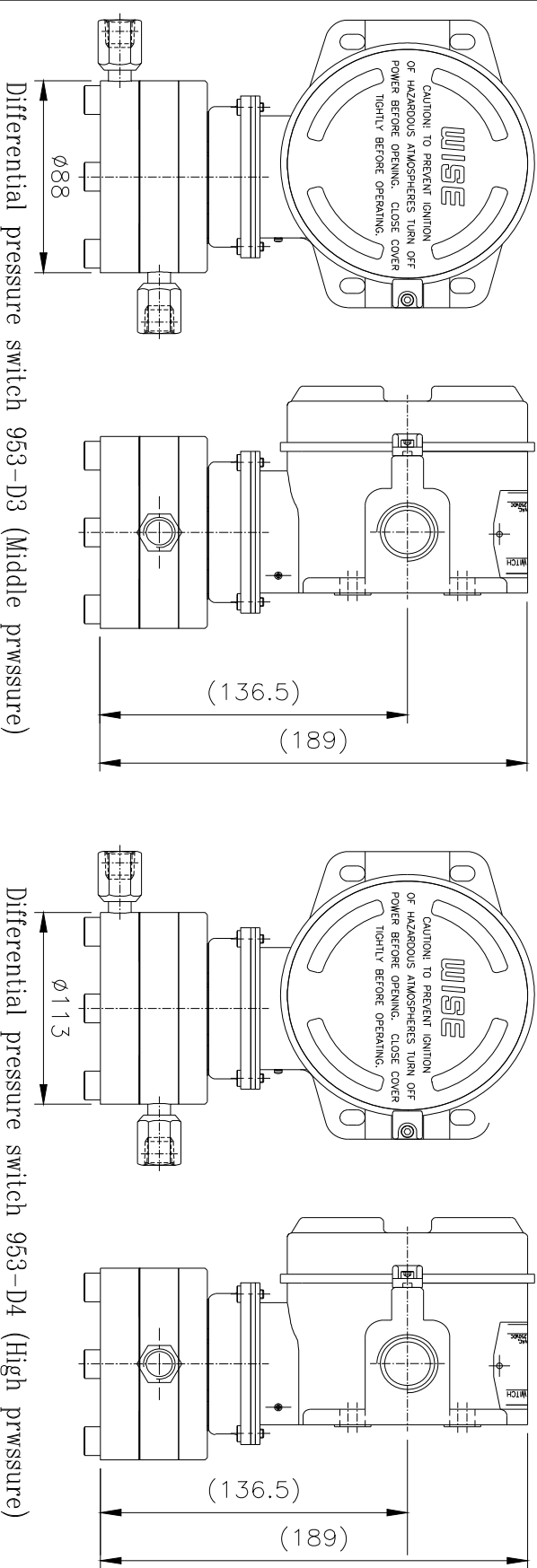
Pressure Switch (P953)



Differential Switch (P970)



Differential pressure switch 953-D1 (Low pressure)



Differential pressure switch 953-D3 (Middle pressure)

Differential pressure switch 953-D4 (High pressure)

※ **Safety certificates are identified by stickers as follows.**

| | |
|--------------------------------|--|
| 1. Manufacturer and Brand Name | 4. Explosionproof Structure Symbol |
| 2. Type | 5. Certificate Authority Name, Mark, and Certificate No. |
| 3. Symbol Ex | 6. X or U |

6. Transportation, Storage and Opening

1) Instruction for Transportation

It may malfunction if it is shocked by falling. Please take good care of it during transportation.

2) Instruction for Storage

Store this product free of moisture, vibration, or dust.

In case of twofold loading, the total weight shall not be heavy enough to deform the packaging box. Also, keep the balance.

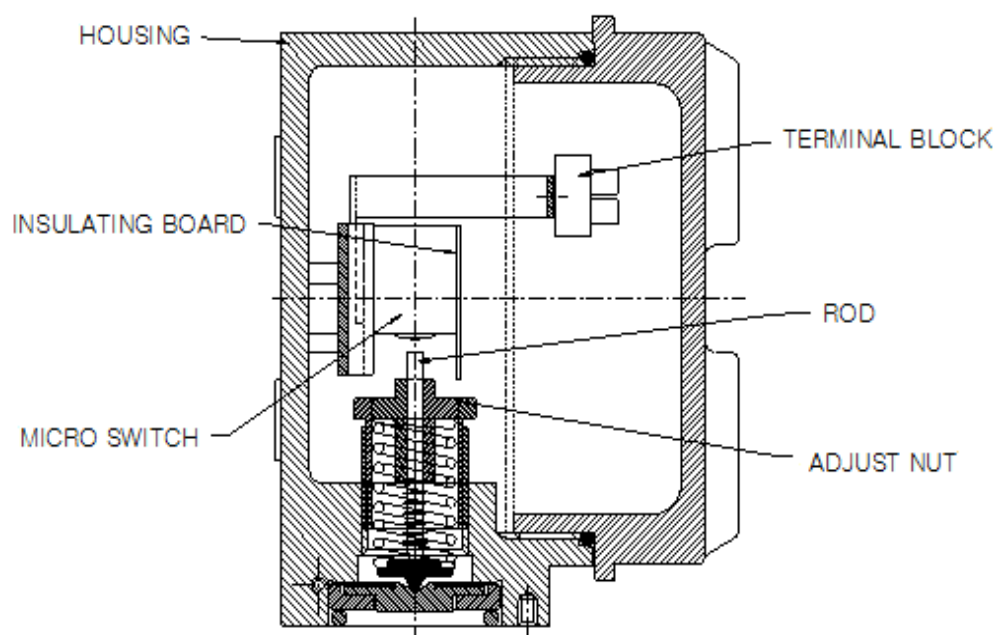
3) Instruction for unpacking

Take good care of the product during unpacking.

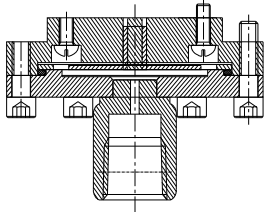
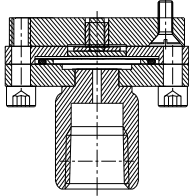
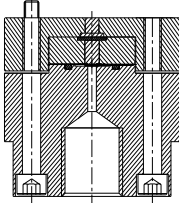
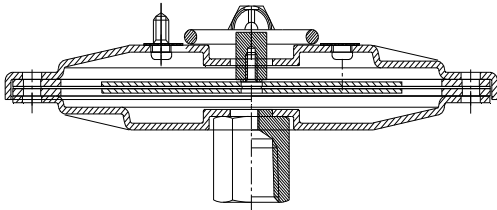
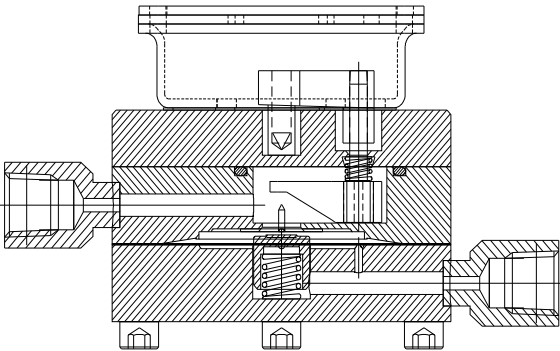
Take the product out of the box in a wide area to prevent it from falling by mistake.

7. Internal Apparatus

1) Housing

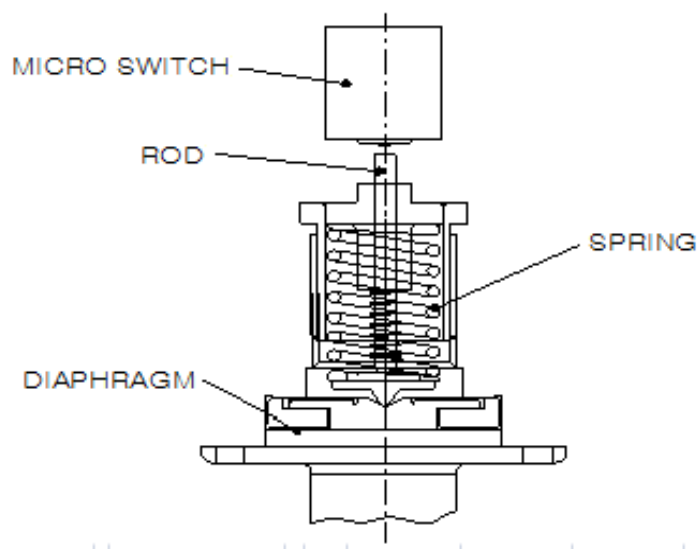


2) Connection Diagram

| PRESSURE SWITCH | | |
|---|---|---|
| Low pressure | Middle pressure | High pressure |
|  |  |  |
| DIFFERENTIAL SWITCH | | |
| Low pressure | Middle, High pressure | |
|  |  | |

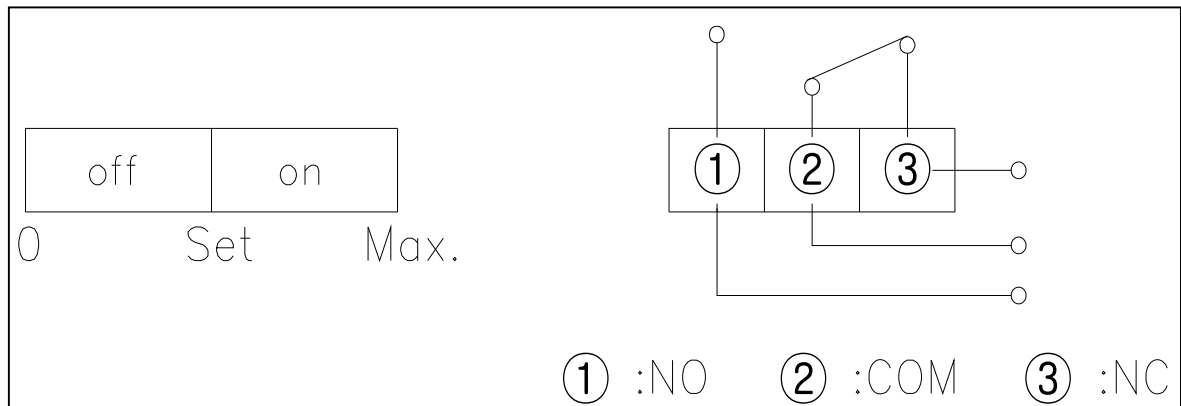
8. Operating Principle

As seen in the drawing, we used a diaphragm for the pressure measuring element and designed the system so that the diaphragm displacement according to the pressure change can be transmitted to the lever through the rod to open or close the micro switch.

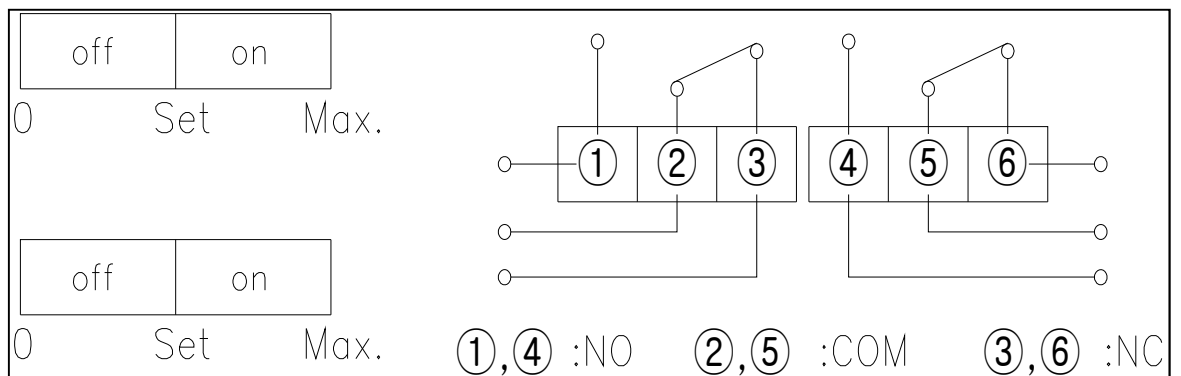


9. Contact Point Working Type and Connection

1) 1 Contact Point Type



2) 2 Contact Point Type



10. Installation

- 1) Store this product free of moisture, vibration, dust or corrosive gas.
- 2) Avoid higher temperature than specified in this manual.
- 3) Be prepared for lightning or vapor.
- 4) Avoid direct sunlight.
- 5) Use M5 bolts when fixing the product to the panel or wall through fixing holes.
When you use fittings, fix them firmly.
- 6) Use a flexible tube for the impulse line to prevent excessive force on the pressure gauge.
- 7) For pipe connection, do not grab and turn the product case, rather use a designated spanner.

11. Wiring

- 1) Do not impose excessive force on the casing.
- 2) Use plastic insulated or cabtyre cables corresponding to the load.
- 3) Use an M4 solderless terminal for firm terminal connection.
- 4) Check the contact type before cable connection.
- 5) In case of conduit type, use waterproof sealing fittings.
- 6) In case of cable gland type, use waterproof cable glands.
- 7) A ground wire shall be at least 0.7sq.

12. Maintenance and Operation

- 1) The commercial pressure shall be below 75% of the max graduation.
- 2) Do not impose a pressure beyond the allowable limit.
- 3) Avoid sudden pressure surge or drop.
- 4) If there is a risk of pulsation or impact pressure, install overpressure protection device like dampener or gauge protector.
- 5) Do not grease the operation parts in the pressure gauge.
- 6) The regular inspection shall be made once or twice in 6 months to check contact operation.
- 7) If the indication instrument makes a big error, remove it from the product for inspection.
It may have been caused by wear, corrosion, external shock, vibration, or shock of a part.
In this case, you must remove, adjust, or exchange the part.
- 8) The standard rated current shall follow 5. 1) but it may be different when the product is equipped with a special micro software. Please, add some allowance to the rated current written in this product, considering the inrush current.
- 9) The micro switch contact resistance is destined to increase gradually as per the elapsed time.

Under minute load in Si environment, in particular, SiO₂ which is accompanied by contact operation may deposit on the contact to increase the contact resistance abruptly, so you must ventilate or move to a clean environment. When you use the product for control

sequence input, there is more possibility of contact disorder, so please use an AC 110/220V buffer relay between the contact and the sequence.

- 10) Before you open or close the cover for pressure gauge repair or inspection, be sure to shut off the power.

Malfunctioning of the switch may ignite the explosive gas in the gauge.