



Pressure Switches Precautions 1

Be sure to read this before handling.

Design / Selection

Warning

1. Confirm the specifications.

Products represented in this catalog are designed only for use in compressed air systems (including vacuum).

Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.)

We do not guarantee against any damage if the product is used outside of the specification range.

2. Use the product within the specified voltage.

Using a switch outside the specified voltage range can cause not only malfunction and damage to the switch, but also an electrical shock and fire.

3. Never use a load which exceeds the maximum allowable load.

A load exceeding the maximum load specification can cause damage to the switch or shorten its operating life span.

4. Do not use a load that generates surge voltage.

Although surge protection is installed in the circuit at the output side of the switch, damage may still occur if a surge is applied repeatedly. When a surge generating load such as a relay or solenoid is directly driven, use a switch with a built-in surge absorbing element.

5. Since the type of applicable fluid varies depending on the product, make sure to verify the specifications.

The switch does not have an explosion proof construction. To prevent a possible fire hazard, do not use with flammable gases or fluids.

6. Be certain to observe the set pressure range and withstand pressure.

Using a switch beyond the specified range may result in malfunction. In addition, using it beyond the withstand pressure (maximum operating pressure) may result in a product failure.

7. Do not replace the circuit board, disassemble the product or make any modifications, including additional machining.

It may cause human injuries and accidents.

Mounting / Piping

Warning

1. Operation manual

Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. If the equipment is not operating properly, do not continue to use it.

Connect air and power after installation, repairs, or modifications. Conduct a performance and leak test to verify that the performed work is proper.

4. Observe the proper tightening torque for mounting a pressure switch.

When a pressure switch is tightened beyond the range of tightening torque, mounting screw, mounting bracket or pressure switch may be damaged. On the other hand, tightening below the range of tightening torque may cause the installed screws to loosen during operation.

Connection Thread: M5, Rc, NPT, NPTF

| Nominal size of thread | Proper tightening torque (N·m) |
|------------------------|-----------------------------------|
| M5 | 1/6 turn after tightening by hand |
| 1/8 | 7 to 9 |
| 1/4 | 12 to 14 |
| 3/8 | 22 to 24 |

5. Attach a wrench only to the metal parts of the main housing when installing a pressure switch in the system piping.

Never attach a wrench to the resin parts, since it may result in damage to the switch.

Caution

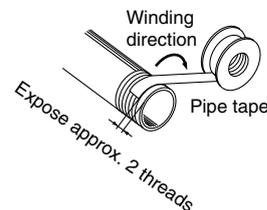
1. Refer to the Fittings and Tubing Precautions (pages 13 to 16) for handling one-touch fittings.

2. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



ZSE
ISE
ZSP
PS
ISA
PSE
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ISG
ZSM



Pressure Switches Precautions 2

Be sure to read this before handling.

Wiring

⚠ Warning

1. Verify the color and terminal number when wiring.

Incorrect wiring can cause damaged and malfunction to the switch. Verify the color and the terminal number in the operation manual when wiring.

2. Avoid repeatedly bending or stretching lead wires.

Broken lead wire will result from repeatedly applying bending stress or stretching force to the lead wires. If the lead wire of a grommet type switch is damaged, the whole switch has to be replaced.

The recommended bend radius for the lead wires is 6 times larger than the sheath outside diameter, or 33 times larger than the insulator outside diameter, whichever comes larger.

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

Air Supply (Pressure Source)

⚠ Warning

1. Type of fluids

Please consult with SMC when using the product in applications other than compressed air.

2. When there is a large amount of drainage.

Compressed air containing a large amount of drainage can cause malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.

3. Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. It causes malfunction of pneumatic equipment.

If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.

For compressed air quality, refer to SMC's Best Pneumatics catalog.

4. Use clean air.

Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

Air Supply (Pressure Source)

⚠ Caution

1. Install an air filter.

Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 μm or smaller.

2. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.

Compressed air that contains a large amount of drainage can cause malfunction of pneumatic equipment such as pressure switches. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

3. Ensure that the fluid and ambient temperature are within the specified range.

If the fluid temperature is 5°C or less, moisture in the piping circuit could freeze, causing damage to the seals and equipment malfunction. Therefore, take appropriate measures to prevent freezing.

For compressed air quality, refer to SMC's Best Pneumatics catalog.

Operating Environment

⚠ Warning

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.

Refer to each construction drawing on the pressure switch material.

2. Do not expose the product to direct sunlight for an extended period of time.

3. Do not use in a place subject to heavy vibration and/or shock.

4. Do not mount the product in locations where it is exposed to radiant heat.

5. Never use in the presence of explosive gases.

The pressure switch does not have an explosion proof construction. If it is used in an environment where explosive gases are used, it may cause an explosive disaster. Therefore, never use it in such an environment.



Pressure Switches Precautions 3

Be sure to read this before handling.

Maintenance

Warning

1. Perform maintenance inspection according to the procedures indicated in the operation manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Maintenance work

If handled improperly, compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3. Drain flushing

Remove drainage from air filters regularly.

4. Removal of components, and supply/exhaust of compressed air

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from sudden movement.

5. Perform periodical inspections to ensure proper operation of the product.

Safety may not be ensured if unexpected malfunction or wrong operation occurs.

6. Use caution when using for an interlock circuit.

When the product is used for an interlock circuit, devise a multiple interlock system to prevent trouble or malfunctioning. Verify the operation of the switch and interlock function on a regular basis.

ZSE
ISE

ZSP

PS

ISA

PSE

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ISG

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Pressure Switches (Electronic) Precautions 1

Be sure to read this before handling.

Design / Selection

⚠ Warning

1. Monitor the internal voltage drop of a switch.

When operating below the specified voltage, it is possible that a load may be ineffective, even though the pressure switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum voltage of the load.

$$\frac{\text{Supply voltage} - \text{Internal voltage drop of switch}}{\text{Voltage of operation load}} >$$

2. Leakage current

A 2-wire switch design requires a minimal amount of current (1 mA or less) to flow through the switch in the OFF condition.

$$\text{Load operating current (Input OFF current on controller)} > \text{Switch leakage current}$$

If the above condition is not met, the switch will not reset (remains ON). If the specification is not met, use a 3-wire switch. If "n" switches are connected in parallel, "n" times the current flows through the loads.

[For general fluids]

3. Do not use any flammable or highly osmotic fluid.

Flammable or highly osmotic fluid may cause fire, explosion, or corrosion.

For information on the chemicals used, refer to the corresponding Material Safety Data Sheet (MSDS).

⚠ Caution

1. Adsorption confirmation switch for presence of a workpiece.

Use the Air Catch Sensor Series ISA (dustproof/dripproof type) for correct workpiece placement.

2. Data of a digital pressure switch are stored even after the power is cut off.

Input data (set pressure, etc.) is stored in an EEPROM so that the data will not be lost after the digital pressure switch is turned off. (Data can be rewritten up to 100,000 times and is stored for up to 100,000 hours after the power is turned off or 10 years.)

Mounting / Piping

⚠ Warning

1. Do not drop or apply the excessive force to the product when handling.

Do not drop, or bump, or apply the excessive force (the value for the impact resistance specification) when handling a switch. The internal parts of the switch can become damaged, and may result in malfunction, even though the switch case itself is not damaged.

2. When handling the product, hold it by the switch body.

The tensile strength of the power source cord is 49 N. If pulled with a greater force, the switch may be damaged. When handling a switch, hold it by the body.

Mounting / Piping

⚠ Caution

1. Refer to the Fittings and Tubing Precautions (pages 13 to 16) for handling one-touch fittings.

2. Piping tubing, etc.

When panel mounting, avoid applying excessive force due to the strength of the piping material. Some tubing materials can cause damage to the piping parts of a switch when an unacceptably large amount of stress is applied to them.

3. Operation by the button

Refer to the operation manual for button operation of a digital pressure switch.

4. Do not touch the LCD readout.

Do not touch the LCD display of the pressure switch during operation. Static electricity can change the readout.

5. Use a straight bladed watchmaker's screwdriver to lightly adjust the trimmer.

Use a straight bladed watchmaker's screwdriver to adjust the set trimmer for I(Z)SE1/I(Z)SE2/PS1□00. Turn it gently and stop turning it when it reaches the stopper at either ends. If a trimmer is broken, it will be impossible to adjust.

6. Pressure port

Do not introduce any wire or similar object to a pressure port as this may damage the pressure sensor and cause malfunction.

Wiring

⚠ Warning

1. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines and high voltage lines, and avoid wiring in the same conduit with these lines. Control circuits, including switches, may malfunction due to noise from these lines.

2. Turn on the power supply after connecting a load.

(2-wire type)

If the switch changes to the ON condition without any load connected, damage will occur due to excess current flow.

3. Do not short-circuit a load.

(3-wire type)

The digital pressure switch displays an error code if the load is short-circuited, but it is impossible to protect the switch from wiring errors. For other pressure switches, the switches will be instantly damaged if loads are short-circuited.

Use caution to avoid reverse wiring between the power supply line (brown) and the output line (black) for 3-wire type particularly.



Pressure Switches (Electronic) Precautions 2

Be sure to read this before handling.

Air Supply (Pressure Source)

⚠ Warning

1. Observe the specified fluid and ambient temperature range.

Ambient and fluid temperature operation is as follows: Digital pressure switches: 0 to 50°C, other pressure switches: 0 to 60°C. Take measures to prevent moisture from freezing in a piping circuit when below 5°C, since this may cause damage to the O-ring and lead to malfunction. The installation of an air dryer is recommended for eliminating condensation and moisture. Never use the product in an environment where there are drastic temperature changes even when these temperatures are within the specified temperature range.

2. Vacuum pressure switch

An instant pressure pulse of up to 0.5 MPa at the time of vacuum release does not affect the performance of the switch. However, a constant pressure of 0.2 MPa or more should be avoided.

Operating Environment

⚠ Warning

1. Do not use in an area, where surges are generated.

Installation of a pressure switch in an area around equipment that generates large surge could cause deterioration in the internal circuitry element of a switch or result in damage to it. Equipment examples include electromagnetic lifters, high frequency induction furnaces, motors, etc. Therefore, take measures to avoid these surges, and avoid mixing the lines with each other.

2. Operating environment

In general, the electronic pressure switches are open type. Avoid using them in an environment where the likelihood of splashing or spraying of liquids (water, oil, etc.) exists. If used in such an environment, use a dustproof or dripproof model.

Maintenance

⚠ Caution

1. Replacement of filter element

Regarding the product with suction filter (ZSE2/ZSE3/ZSP1), when the filter element is clogged, stop the operation to replace the elements.

2. Cleaning of switch body

Use a soft cloth to remove any dirt. If the dirt does not come off easily, use a neutral detergent diluted with water to dampen a soft cloth. Wipe the switch only after squeezing the excess water out of the dampened cloth. Then, finish off by wiping with a dry cloth afterwards.

[For general fluids]

3. Practice the following to prevent damage by chemicals when the condition of the product is inspected:

- 1) Do not touch any chemicals that remain in the piping and the pressure switches.
- 2) Confirm the product names and the characteristics of the chemicals used and handle them with care.

| |
|-----|
| ZSE |
| ISE |
| ZSP |
| PS |
| ISA |
| PSE |
| IS |
| ISG |
| ZSM |



Flow Switches Precautions 1

Be sure to read this before handling.

Design / Selection

Warning

1. Confirm the specifications.

Products represented in this catalog are designed only for use in compressed air systems (including vacuum).

Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.)

Please contact SMC when using a fluid other than compressed air (including vacuum).

We do not guarantee against any damage if the product is used outside of the specification range.

2. Use the product within the specified voltage.

Using outside the specified voltage range can cause not only malfunction and damage to the switch, but also an electrical shock and fire.

3. Never use a load which exceeds the maximum allowable load.

A load exceeding the maximum load specification can cause damage to the switch or shorten its operating life span.

4. Since the type of applicable fluid varies depending on the product, make sure to verify the specifications.

The flow switch does not have an explosion proof construction. To prevent a possible fire hazard, do not use with flammable gases or fluids.

[For air]

5. Be certain to observe the specified flow rate for measurement and the maximum operating pressure.

Operating beyond the specified flow rate and operating pressure can damage the flow switch.

[For water]

6. Be certain to observe the specified flow rate for measurement and the maximum operating pressure.

Operating beyond the specified flow rate and operating pressure can damage the switch.

Especially avoid applications involving pressures beyond the specification applied through a water hammer.

<Countermeasure examples>

- 1) Use a device such as a water hammer relief valve, to slow the valve's closing speed.
- 2) Absorb an impact pressure by using a rubber material piping such as a rubber hose and an accumulator.
- 3) Keep the piping length as short as possible.

7. Do not disassemble the product or make any modifications, including additional machining.

It may cause human injury and/or an accident.

Mounting / Piping

Warning

1. Operation manual

Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Observe the proper tightening torque for mounting a flow switch.

When tightened beyond the specified tightening torque, the switch may be damaged.

On the other hand, tightening below the specified tightening torque may cause the installed screws to loosen during operation.

| Nominal size of thread | Proper tightening torque (N·m) |
|------------------------|--------------------------------|
| 1/8 | 7 to 9 |
| 1/4 | 12 to 14 |
| 3/8 | 22 to 24 |
| 1/2 | 28 to 30 |
| 3/4 | 28 to 30 |
| 1 | 36 to 38 |

4. Attach a wrench only to the metal parts of the piping when installing a flow switch in the system piping.

Never attach a wrench to the resin or plastic parts of the main housing, since it may result in damage to the switch.

5. Monitor the flow direction of the fluid.

Install a switch in the direction as indicated on the body or cover.

6. Before connecting a flow switch with piping, blow air through it to remove any foreign matter, etc.

7. Do not drop or bump.

Do not drop, bump, or apply excessive impacts (490 m/s²) while handling. Although the external body of the switch (switch case) may not be damaged, the inside of the switch could be damaged and cause malfunction.

8. Hold the body of a switch when handling.

The tensile strength of the cord is 49 N. Applying a greater pulling force on it can cause malfunction. When handling, hold the body of the switch - do not dangle it from the cord.

9. Do not use until you can verify that equipment can operate properly.

Verify whether it is mounted correctly by running fluids or applying electricity in order to conduct a suitable function and leakage test when mounting for the first time or after system repair or modification was made.

[For air]

10. Never install a flow switch in a place, where the switch will be used as a foothold in the piping.

If an excessive load is applied on a switch, the switch may be damaged.

11. Be certain to allow straight-line pipe length that is more than 8 times longer than the port size diameter of the piping in the inlet side of the flow switch.

Do not suddenly narrow the pipe size because doing so will disturb the flow speed distribution in the pipe, making it impossible to obtain the correct measurements.



Flow Switches Precautions 2

Be sure to read this before handling.

Mounting / Piping

Warning

[For water]

12. Never install a flow switch in a place, where the switch will be used as a foothold in the piping.

Damage may occur if an excessive load is applied to the switch. Especially when the flow switch supports the piping at one side, do not apply a load of 15 N·m or more to the metal parts of the switch.

13. Be certain to allow a straight-line pipe length for the piping in the inlet side of the flow switch. (Electronic type: 8 times longer than the port size, mechanical type: 5 times longer than the port size)

When suddenly narrowing the pipe size or if there is a throttle of the valve on the inlet side, the flow speed distribution in the pipe will be disturbed, and make it impossible to obtain the correct measurements. For this reason, procedures such as these should be carried out on the outlet side of the switch.

Also, leaving the outlet side open may encourage cavitation to occur, so please exercise caution.

Caution

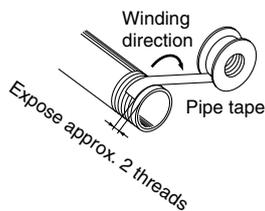
1. Refer to the Fittings and Tubing Precautions (pages 13 to 16) for handling one-touch fittings.

2. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



Wiring

Warning

1. Verify the color and terminal number when wiring.

Incorrect wiring can cause damaged and malfunction to the switch. Verify the color and the terminal number in the operation manual when wiring.

2. Avoid repeatedly bending or stretching lead wires.

Broken lead wire will result from repeatedly applying bending stress or stretching force to the lead wires. If the lead wire of a grommet type switch is damaged, the whole switch has to be replaced.

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

Fluid

Warning

1. Check regulators and the flow adjustment valves before introducing the fluid.

If pressure or flow rate beyond the specified range are applied to the switch, the sensor unit may be damaged.

[For air]

2. Measured fluids for the flow switch are nitrogen and air.

Take note that accuracy cannot be guaranteed when other fluids are used.

3. Never use flammable fluids.

It may cause a fire and or an explosion.

The flow speed inspection part is used in a heated condition at 150°C.

4. Install a filter or mist separator on the inlet side when there is a possibility of condensation and foreign matter being mixed in with the fluid.

The rectifying device built into the switch will be clogged up and accurate measurement will no longer be possible.

[For water]

5. Never use flammable fluids.

6. Install a filter on the inlet side when it is likely for foreign matter to get mixed with fluids.

PFM

PFMV

PF2A

PF2W

PF2D

IF



Flow Switches Precautions 3

Be sure to read this before handling.

Operating Environment

Warning

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.

Refer to each construction drawing on the flow switch material.

2. Do not expose the product to direct sunlight for an extended period of time.
3. Do not use in a place subject to heavy vibration and/or shock.
4. Do not mount the product in locations where it is exposed to radiant heat.
5. Never use in the presence of explosive gases.
The flow switch does not have an explosion proof construction. If it is used in an environment where explosive gases are used, it may cause an explosive disaster. Therefore, never use it in such an environment.
6. Mount the flow switch in a location where no vibration or shock (98 m/s² or less) is present.

[For air]

7. Observe the specified fluid and ambient temperature range.

Fluid and ambient temperatures are 0° to 50°C. Take measures to prevent freezing fluid when below 5°C, since this may cause damage to a switch and lead to malfunction. The installation of an air dryer is recommended for eliminating condensation and moisture.

Never use the product in an environment where there are drastic temperature changes even when these temperatures are within the specified temperature range.

[For water]

8. Observe the specified fluid and ambient temperature range.

Take measures to prevent freezing fluid when below 5°C, since this may cause damage to the flow switch and lead to malfunction.

Maintenance

Warning

1. Perform maintenance inspection according to the procedures indicated in the operation manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Maintenance work

If handled improperly, compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3. Drain flushing

Remove drainage from air filters regularly.

4. Removal of equipment, and supply/exhaust of compressed air

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from sudden movement.

5. Perform periodical inspections to ensure proper operation of the product.

Safety may not be ensured if unexpected malfunction or wrong operation occurs.

6. Use caution when using for an interlock circuit.

When the product is used for an interlock circuit, devise a multiple interlock system to prevent trouble or malfunctioning. Verify the operation of the switch and interlock function on a regular basis.



Flow Switches (Electronic) Precautions 1

Be sure to read this before handling.

Design / Selection

⚠ Warning

1. Do not use a load that generates surge voltage.

Although surge protection is installed in the circuit in the output side of a flow switch, damage may still occur if a surge is applied repeatedly. When working directly such an unit as relay, solenoid valve, etc., which generates surge, use a built-in surge absorbing element type.

2. Monitor the internal voltage drop of a flow switch.

When operating below the specified voltage, it is possible that a load may be ineffective, even though the flow switch function is normal. Therefore, the formula below should be satisfied after confirming the voltage of the load.

$$\text{Supply voltage} - \frac{\text{Internal voltage drop of switch}}{\text{Voltage of operation load}} >$$

[For water]

3. Design the system so that the fluid always fills the detection passage.

Especially for vertical mounting, introduce the fluid from the bottom to the top.

4. Do not exceed the specified flow range.

If operated outside of the flow measurement range, Karman vortex does not occur and normal measurement cannot be done.

⚠ Caution

1. Data of a flow switch are stored even after the power is cut off.

Input data is stored in an EEPROM so that the data will not be lost after the flow switch is turned off. (Data can be rewritten for up to 100,000 times and data is stored for up to 20 years, 1 million times for the PF2A7□H series.)

Mounting

⚠ Warning

[For water]

1. Be certain to allow the straight-line pipe length, that is more than 8 times longer than the port size diameter for the piping in the inlet side of the flow switch.

When abruptly reducing the size of piping or when there is a restriction such as a valve on the inlet side, the pressure distribution in the piping changes and makes accurate measurement impossible. Therefore, flow restriction measures such as these should be implemented on the outlet side of the switch. When used with the outlet side open, be careful of the cavitation that is prone to occur.

Wiring

⚠ Warning

1. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines and high voltage lines, and avoid wiring in the same conduit with these lines. Control circuits, including switches, may malfunction due to noise from these lines.

2. Do not short-circuit a load.

Although the switch displays an overcurrent error if a load is short-circuited, there is not protection against incorrect wiring (power source polarity, etc.). Use caution to avoid wiring incorrectly.

Fluid

⚠ Warning

[For water]

1. Measured fluid for the switch is water.

Take note that accuracy cannot be guaranteed when other fluids are used.

2. Install a filter on the inlet side when foreign matter is likely to be mixed with the fluid.

If foreign matter adhere to the switch's vortex generator or vortex detector, an accurate measurement cannot be made.

Operating Environment

⚠ Warning

1. Do not use in an area, where surges are generated.

Installation of a switch in an area around equipment that generates large surge could cause deterioration in the internal circuitry element of a switch or result in damage to it. Equipment examples include electromagnetic lifters, high frequency induction furnaces, motors, etc. Therefore, take measures to avoid these surges, and avoid mixing the lines with each other.

2. Avoid using the product in an environment where the likelihood of splashing or spraying of liquids and oils exist.

The display part is open type. Avoid the use in such an environment mentioned above.

[For water]

3. Observe the specified fluid and ambient temperature range.

Fluid and ambient temperature is ranged from 0 to 50°C. Take measures to prevent moisture from freezing in a piping circuit when below 5°C, since this may cause damage to the product and lead to malfunction. Even when the ambient temperature range is within the specifications, do not use in locations where there are rapid temperature changes.

PFM

PFMV

PF2A

PF2W

PF2D

IF



Flow Switches (Electronic) Precautions 2

Be sure to read this before handling.

Others

Warning

1. The output of a switch remains off during displaying of message right after the power is supplied. Start measurements after this.
2. Perform settings after stopping the control systems.

The output turns off while initial setting and flow setting.

3. Do not apply excessive rotational force to the display unit.

The integrated type display unit can rotate 360°. Rotation is controlled by the stopper. However, the stopper may be damaged if the display unit is turned with excessive force.

[For air]

4. Confirm that the flow rate is at zero before turning on the power.

Allow an interval of 10 minutes after turning on the power, as there are some changes in the display.

5. Flow rate unit

The switch measures the mass flow rate without being influenced by temperature and pressure. The unit displays ℓ/min . However, since mass flow rate is measured, it must be converted into volume flow rate at 20°C at 1 atmospheric pressure (101 kPa) 65% R.H (ANR).