



Fluorine Resin Type Pressure Sensor

H P M

S H P M

Operation Manual

SURPASS INDUSTRY CO., LTD.

Before Using

- Before using this product, check the compatibility of the type of liquid to be used and the material of the product's wetted parts.
- All users are required to carefully read and understand this manual before operation of the product.
- Keep this manual in good condition and close at hand for quick reference whenever necessary.
- Use the product only as intended, and only as directed in this manual.
- Cautionary notes in this manual must be fully understood and complied with at all times.




About This Operation Manual

- The contents of this manual are subject to change without prior notice, due to improvements in product functionalities and / or performance.
- No part of this manual may be reproduced in any form or by any means.
- Although this manual has been prepared with all possible care, please do not hesitate to contact Surpass Industry about errors, omissions, or any other points of doubt.



Important Safety Instructions

<Symbols in this Operation Manual>

Warnings and cautionary notes are provided in this manual to ensure this product is used correctly and to prevent personal injury and property damage. The meanings of the WARNING and CAUTION symbols in this manual are as described below. Please continue reading once you have understood the content well.

 DANGER	This symbol indicates warnings against impending danger which, if not observed, may cause death or severe injury to the user.
 WARNING	This symbol indicates warnings which, if not observed, may cause death or severe injury to the user.
 CAUTION	This symbol indicates warnings which, if not observed, may physically impair the user or damage surrounding objects.

Warnings

 WARNING	 WARNING
<ul style="list-style-type: none"> ● <u>This product is not explosion-proof.</u> Never use it with flammable fluids such as solvents. Doing so may cause fire and or explosion and is highly dangerous. ● Never disassemble or alter the product. Doing so will cause breakage of the product and possible liquid leakage. The use of dangerous chemicals, solvents, and gases may cause physical impairment. ● Do not apply more withstanding pressure than the allowed maximum output. Otherwise, the product may fail and cause liquids to leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment. ● Do not insert screwdrivers, wires, or other objects into the connector parts. Otherwise, the product may fail and cause liquids to leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment. ● Do not excessively pull or bend the cables. Doing so may cause wiring disconnections, which may cause electrical shock and fire hazards. ● Install the pressure sensor in an area that is dry and clean. Supply power to the pressure sensor from an isolation transformer (switching power supply) rated for 24 VDC or less. Make sure the rated power output is 150 VA and does not exceed 2A. (Use exclusively for class 2 circuits) 	<ul style="list-style-type: none"> ● When mounting connector parts, comply with the instructions issued by each connector manufacturer. If the fittings are loosely attached, they may come off or liquids may leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment. ● Do not use the product in areas where corrosive gases are being ejected. Otherwise, the body or fitting will corrode and cause liquids to leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment. ● Obey these instructions. <ul style="list-style-type: none"> • Refrain from excessive tightening of the connector parts. • Do not install the product in areas of excessive vibration or shock. • Use the product only within the specified operating environment. Otherwise, the body or fittings will corrode and cause liquids to leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment. ● Protect all wiring used by providing support along the wiring at appropriate distances. ● For shielded cables, peel the sheath at the very end of the cable and connect the shield to the chassis or mounting plate, etc., using the proper tool (recommended tool: Nitto Supply AL-2).

Product Overview

<Usage>

PTFE Pressure Sensors can be used as semiconductor manufacturing devices or as pressure monitor/process control devices for chemical processes, high-purity fluids, etc.

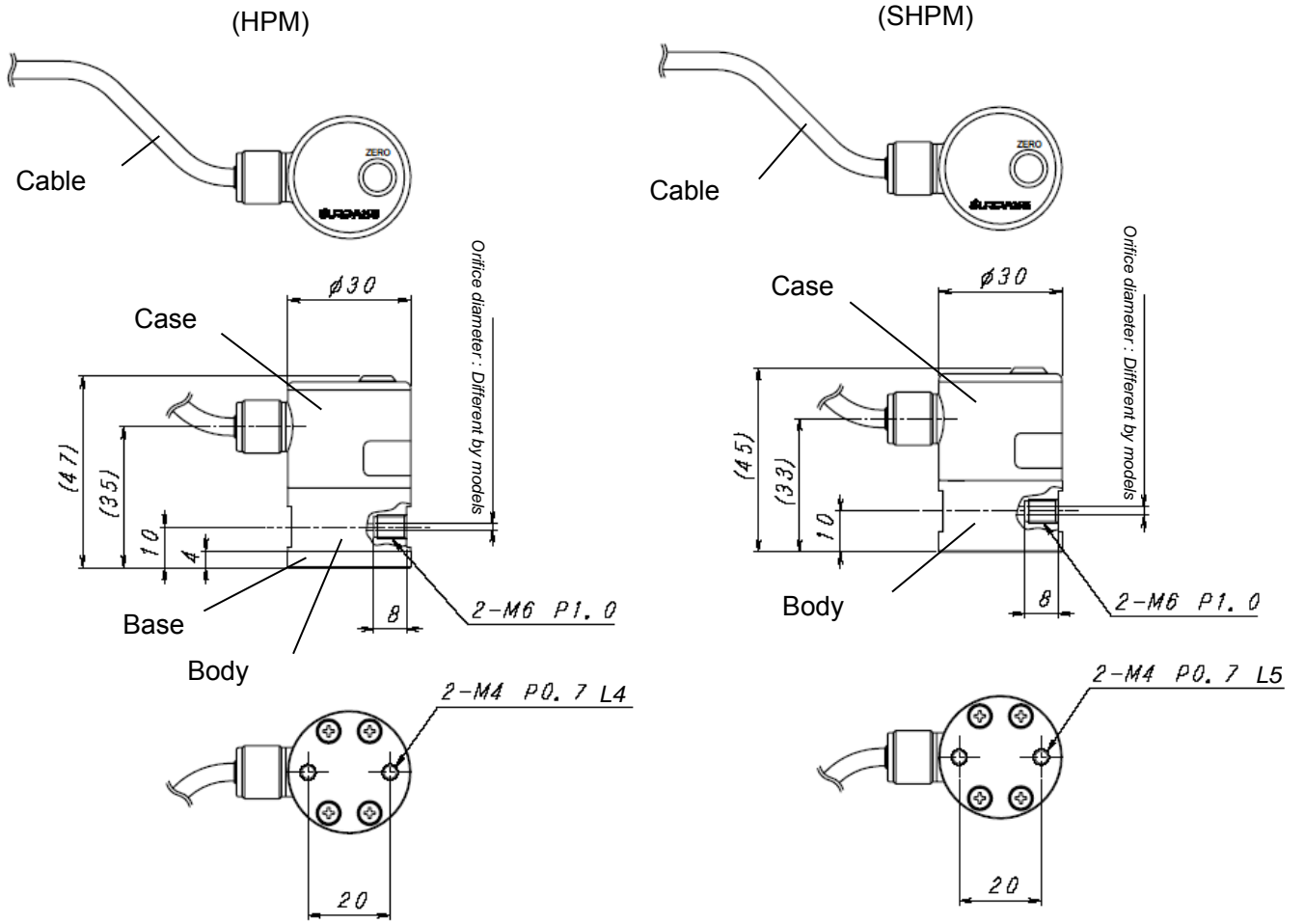
<Features>

- All models comply with the RoHS directive/CE Marking
- The wetted part is made of fluorine resin/SUS316L allowing it be used with a variety of chemicals.
- Because the Pressure Sensors use strain gauge, they offer you excellent reliability and durability.

Specification

Model	HPM	SHPM
Type	Inline type	
Standard Rated Pressure Range	0 to 500 kPa (see nameplate)	
Withstanding Pressure	in the case of Standard Rated Pressure Range: 150% of rated pressure (differs depending on rated pressure)	
Pressure Type	Gauge Pressure	
Applicable Fluid	Liquids, gases	
Linearity	±1%F. S. (at 25°C)	
Hysteresis	±1%F. S. (at 25°C)	
Temperature Effects	±0.08%F. S. / °C	
Analog Output	DC 4 to 20mA	
Power Supply	DC 12 to 24 V ±10%	
Current consumption	Max .30mA (24V)	
Temperature range of environment	15 to 50°C	
Temperature range of fluid	15 to 80°C	
Standard Cable	6-core shielded cable (AWG 28), OD Ø4.5 mm 2m	
Material of wetted parts	PTFE, High Purity Sapphire	SUS316L, High Purity Sapphire
Body Color	Red	
Protection level	Conforms to IP65	

Outer Dimensions



Installation instructions and fitting connections

If you wish to anchor your Pressure Sensor, always use the mounting holes in the base.

In order to install connector parts correctly, always refer to the catalog or operation manual issued by the connector manufacturer.

⚠ WARNING

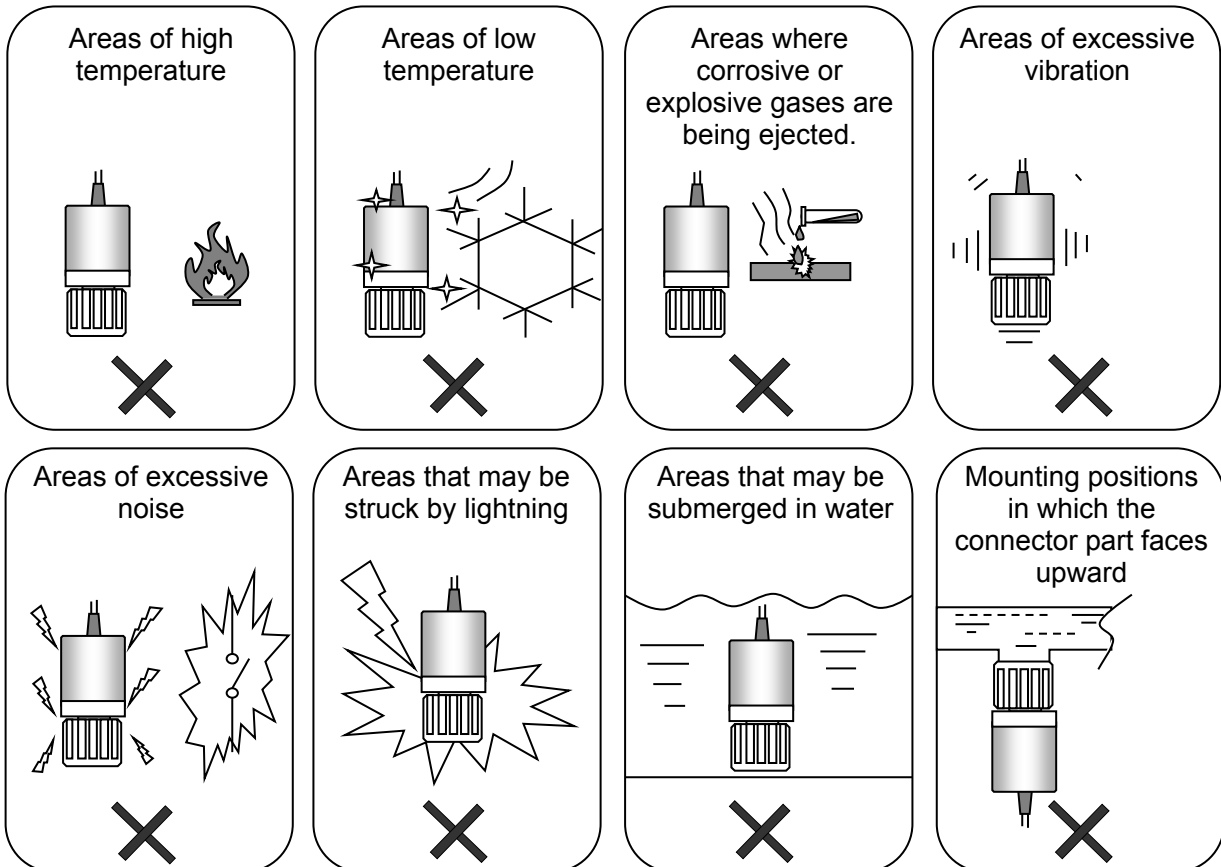
- When mounting connector parts, comply with the instructions issued by each connector manufacturer. If the fittings are loosely attached, they may come off or cause liquids to leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment.
- Do not excessively tighten the connector parts. Otherwise, the body or connectors may corrode and cause liquids to leak. The use of dangerous chemicals, solvents, and gases may cause physical impairment.

⚠ CAUTION

- When tightening the connectors, avoid tightening while holding or turning the main body case. Turning the case may lead to damages on the product.
- The product's case is not a rotary type case. Turning the case may lead to damages on the product.
- Please do not rotate the pressure sensor after tightening the connector. If change the direction, Please loosen the connector.

Points to Observe When Installing

To prevent erroneous operation or premature wear, do not install in:



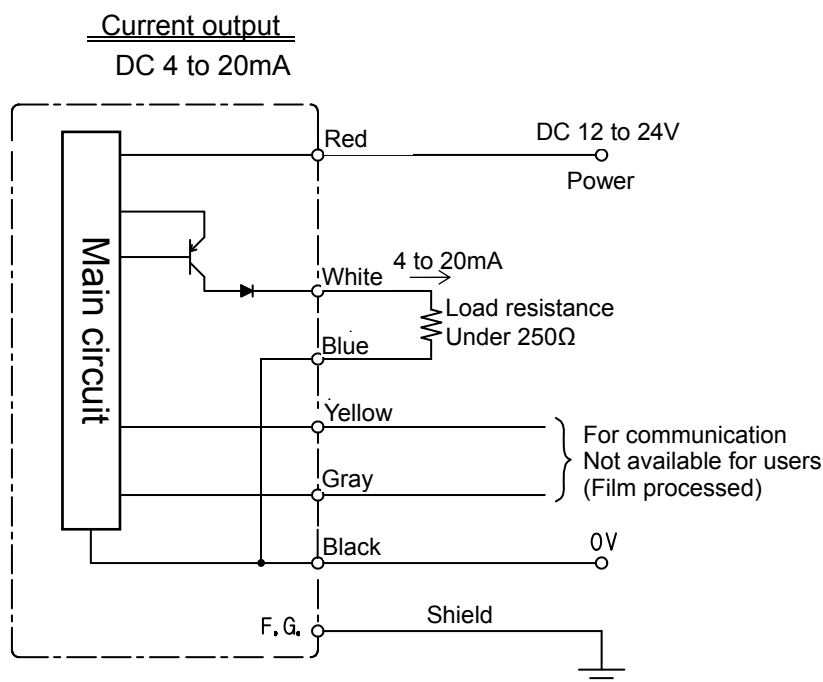
Wiring

Observe these precautions to connect the leads correctly.

⚠ CAUTION

- Never do wiring work when power supply is on. Doing so may cause electrical shock.
- Do not excessively pull or bend the cables. Doing so may cause disconnections which may cause electrical shock and fire hazards.
- Make sure to connect all leads correctly. Failure to do so may cause the product to fail.
Do not connect a power supply to Blue line and Black line, because they are connected inside.
If they are connected to a power supply, a product breaks down.
- If you are using a commercially available switching regulator as a power supply, always ground it to an F. G. terminal. If electricity leaks to earth, it may cause electrical shock.
- Connect the shield on shielded cables to the frame ground as necessary.

<Pressure sensor wiring diagram>



Usage

Check the following items before using your Pressure Sensor.

- (1) After making sure that your Pressure Sensor is not in a pressurized condition, switch the power supply ON.
- (2) Warm up your equipment by running “on empty” for approximately 20 minutes after power-on.
- (3) Check to see that the externally displayed pressure and analog output values are as shown below.

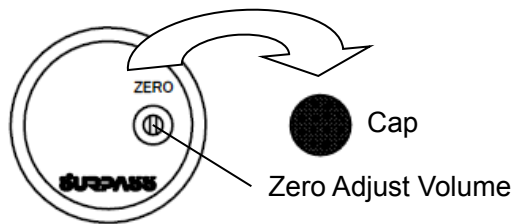
Externally displayed pressure: 0 kPa
Output Value Current: 4 mA

- (4) If the externally displayed pressure or analog output values are not as shown below, you will need to adjust zero tracking following the instructions in “How to Adjust Zero Tracking.”

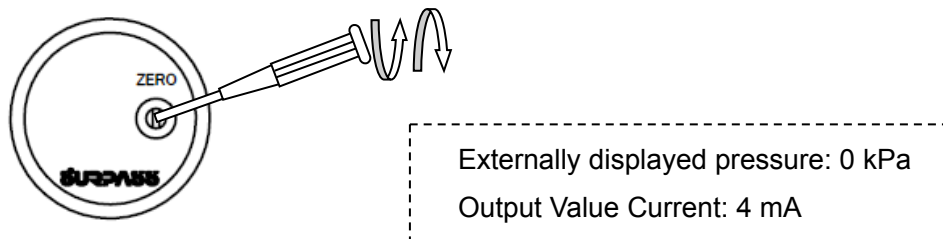
Externally displayed pressure: 0 kPa
Output Value Current: 4 mA

How to Adjust Zero Tracking

- (1) Make sure that your Pressure Sensor is not in a pressurized condition.
- (2) Remove the cap (black) on your Pressure Sensor's cable side.

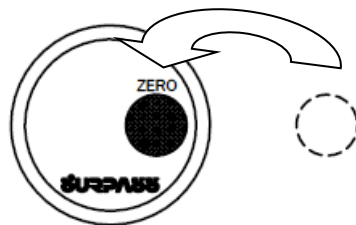


- (3) Using a minus driver, adjust the Zero Adjust Volume so that the externally displayed pressure or output values are as shown below.



- * When conducting zero adjustments, please use an appropriately-sized minus driver and do not apply excessive force.

- (4) Confirm that the zero adjustment is complete, replace the cap and start using your equipment.



- * Please conduct periodic zero adjustments.

CAUTION

Before adjusting the zero tracking procedure, be sure the pressure sensor is in a non-pressurized state.

Maintenance/Inspections


The Pressure Sensor should be inspected regularly, about twice a year depending on the usage.

Items to check during periodic inspection

- External appearance
- Corrosion, clogging, or leakage at the fitting connection

The Pressure Sensor should be flushed periodically if using liquids that crystallize easily.

<Cautions during Maintenance/Inspection>

 DANGER unless these precautions are not obeyed!	
<ul style="list-style-type: none"> • If using dangerous chemicals, solvents, gases, etc., make sure to wear protective, chemical resistant gear (protective gloves, mask, and clothing) to protect your entire body. Ejected liquids may result in physical impairment. • Before disconnecting this product from the piping system, make sure the line is depressurized. Otherwise, the fluid inside will eject and may result in physical impairment. • When replacing parts, or when performing maintenance or inspection, turn off the switch, and release the fluid inside the piping to depressurize the line. Otherwise, the fluid inside will eject and may result in physical impairment. 	

Check points in the case of possible breakdowns

Symptom	Cause	Countermeasure
No output values are shown	Incorrect wiring.	Check the wiring diagram and correct the wiring.
	Incompatible power, voltage.	Check the power supply and voltage.
The output value doesn't change	There is no pressure left inside the piping	Check the pressure inside the piping
The Zero point is off	The equipment has not been warmed up.	After the equipment has been warmed up over 20 minutes, please conduct the zero adjustment.
	There is pressure left inside the piping	Depressurize your piping system.
	The zero adjustment has not been properly conducted	In a depressurized state, adjust the zero adjustment volume so that the current value/voltage value attains the specified value. (Please refer to P7 for predetermined current and voltage.)
The Output Value is Unstable.	The equipment has not been warmed up.	Warm up the equipment for at least 20 minutes.
	There is noise-generating equipment nearby.	Move the noise-generating equipment from the vicinity.
	The shield wire is not grounded.	Ground the shield wire.
	The pressure inside the piping system is fluctuating.	Stop the pressure inside your piping system from fluctuating.

Notify your nearest sales office for problems not listed above.

Regarding the Warranty

This product has been submitted to strict tests and inspections prior to delivery, and is covered with a free-repair guarantee for the period of one year from date of product delivery. During this period, Surpass Industry will provide free repair service for all breakdowns, which we recognize as designer/manufacturer's responsibility.

We are not responsible for the compensation of any direct or indirect loss or damages, personal injuries or any other issues resulting from the usage of the SURPASS INDUSTRY CO., LTD. product alone or in combination with other products, beyond the product's specification conditions. The SURPASS INDUSTRY CO., LTD. warranty's compensation is limited to the replacement of products.

However, the warranty is voided (i.e. the customer pays for repairs) in case of the following.

- Breakdown or damage caused by product handling or usage that does not comply with the product's operation manual.
- Breakdown or damage caused by careless handling or usage of the product.
- Breakdown or damage caused by disassembly or alteration, or inappropriate adjustment or repair of the product.
- Breakdown or damage caused by natural disasters or other acts of God.
- Replacement of consumable articles or accessories.



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