GLOSSARY
PRESSURE SENSORS

● General specifications

• Rated pressure
The maximum value of the pressure at which all the specifications of the pressure sensor can be met or the value of the pressure which can be continuously applied to the pressure sensor without losing the performance characteristics to meet all the sensor specifications.

• Maximum pressure
The maximum pressure which can be applied to the pressure sensor. The sensor specifications are to be met even after the maximum pressure is applied to the sensor for a short period of time. (However, there is a possibility that the offset voltage/zero voltage changes.)

• Break-down pressure ⚠
The pressure at which the pressure sensor is mechanically or electrically damaged.
It should be noted that at this pressure, pressure media may leak out from the pressure sensor.

• Compensated temperature range
The temperature range within which the sensor specifications are satisfied.
Our standard pressure sensors are compensated for a temperature range of 0 to 50 °C.

• Operating temperature range
The temperature range within which the pressure sensor can be used without causing any permanent damage.
Pressure sensors may be used at a temperature beyond the compensated temperature range but within the operating temperature range. However, in this case, sensor specifications may not be met.

• Storage temperature range
The temperature range within which the pressure sensor can be stored without causing any permanent change in the sensor specifications. No load conditions, namely, no power supply and no pressure application are assumed for the storage.

• Operating humidity range ⚠
The humidity range within which the pressure sensor can be operated without causing any permanent change in the sensor specifications.
It is to be noted that the condensation that may be generated due to a rapid temperature change may damage the pressure sensor.

• Bridge resistance
The resistance between the input terminals of the pressure sensor which is measured with the input and output terminals open.

• Pressure medium
Our pressure sensors consist of two compatible fluids type: Gases only and gases and liquids.

• Insulation resistance
The DC resistance between the housing of the pressure sensor (pressure port) and the sensor circuit.

• Dielectric strength
The AC voltage which can be applied between the housing of the pressure sensor and the sensor circuit without leakage current.

• Excitation/power supply
The supply voltage/current to operate the pressure sensor.
Our standard pressure sensors without amplifier is excited by current, whereas other pressure sensors are driven by voltage.

● Analog output

• Offset voltage
The output voltage when no pressure is applied to the pressure sensor.
In the case of absolute pressure type pressure sensors, the offset voltage is at the absolute vacuum.

• Zero voltage/current
The output when no pressure is applied to the pressure sensor.
In the case of absolute pressure type, zero voltage / current is at the absolute vacuum.

• Span voltage/current
The difference between the output when rated pressure is applied to the pressure sensor and the zero voltage/current.

• Linearity
The maximum deviation of the actually measured output from the linear output which is defined by connecting the no load output and rated output points when the pressure is increased from no load to the rated pressure. (Fig. 1) The error is expressed in percent against the span output.

• Hysteresis
The maximum difference between the output when the pressure to the pressure sensor is increased from no load to the rated pressure and the output when the pressure is decreased from the rated pressure to no load. The error is expressed in percent against the span output. (Fig. 1)

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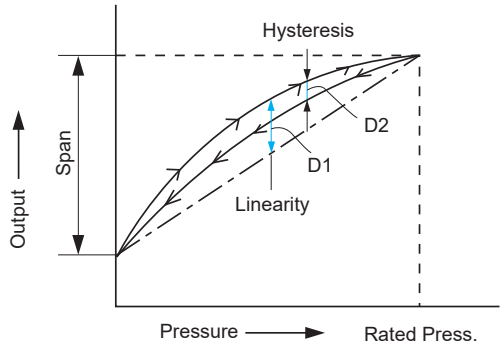
• Linearity/hysteresis
The sum of the linearity and hysteresis errors.

(Fig. 1)



$$\text{LINEARITY} = \frac{\text{D1 max.}}{\text{Span}} \times 100\ [\%\text{F.S.}]$$

$$\text{HYSTERESIS} = \frac{\text{D2 max.}}{\text{Span}} \times 100\ [\%\text{F.S.}]$$

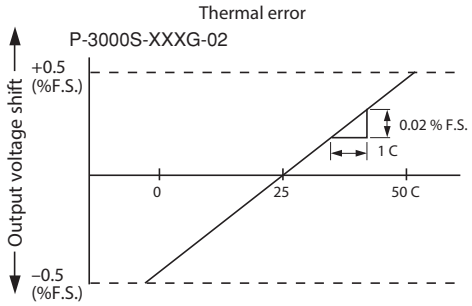
• Response time
The time that the rated output voltage increases from 10 % to 90 % in the maximum amplitude or decreases after the pulse of the rated pressure is applied to a pressure sensor.

• Supply voltage effect
The percentage change in the zero output and span output, when the supply voltage is varied from its minimum spec. value to the maximum spec. value.

• Gravitational effect
The percentage change in the zero output due to gravity.

• Thermal error
The percentage change per one degree C in the zero voltage/current and span voltage/current against the span voltage/current at 25°C when the ambient temperature of the pressure sensor is varied from 25 °C (reference temperature) to 0°C (cold side) and to 50°C (hot side).

(Fig. 2)



● Switch output

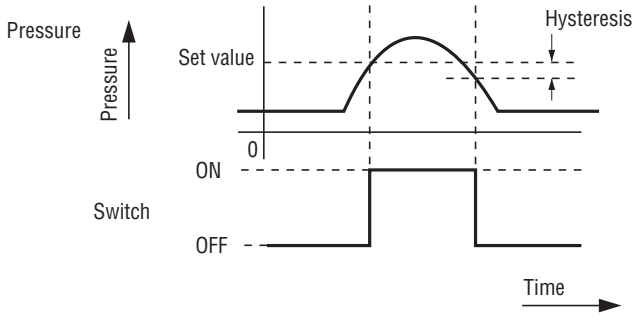
• Output interface

The output interface of our standard pressure switches is an open collector ended switching transistor of either NPN or PNP junctions.

• Hysteresis

The change in the operating pressure point (where the pressure switch operates on and off) when the pressure is increased/decreased.

(Fig. 3)



• Setting range

The adjustable pressure range for the switch output.

• Switching capacity

The maximum capacity of the output transistor of the pressure switch.

• Operating accuracy

The accuracy of the operating pressure point when the ambient temperature is varied.

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PRESSURE SENSORS

● Display (for pressure gauges and pressure monitors)

• Rated display range
The range of pressure displayed and is from a no load value to the rated pressure.

• Display accuracy
The display accuracy when the ambient temperature of the display is varied.

• Display cycle (Sampling rate)
The number of display cycles per second.

● Environmental test

• Vibration
This test checks for the effect the pressure sensor undergoes after the vibration of certain frequency and certain amplitude is applied to the pressure sensor for a specified period of time.

• Pressure cycling
The pressure sensor is checked after the application of no load and rated pressure is repeated a specified number of times.

• Shock
This test checks for the effect on the pressure sensor after the shock of certain magnitude and certain wave shape is applied to the pressure sensor a specified number of times.

• Moisture resistance
The effect on the pressure sensor is checked after the sensor is subjected to a high temperature and high humidity condition for a specified period of time.

※ The environmental test conditions for the above tests are specified for each product individually.
The effect of the test is checked in terms of a percentage change in the output voltage/current, switch output settings and displayed pressure against either the span voltage/current or the rated pressure.