

MPM280 Piezoresistive OEM Pressure Sensor

- Process control systems
- Liquid Measurement
- Hydraulic systems and switch
- Biomedical instruments



Introduction

MPM280 is an OEM piezo-resistive pressure sensor with a stainless steel housing and isolated by a corrugated diaphragm. In which, the silicon pressure sensitive element adopts advanced ion implantation and micro-mechanical working technology to form Wheatstone bridge and precise mechanical structure, the measuring pressure is transmitted onto the silicon sensitive element through isolated diaphragm and filled silicon oil. This achieves the integrated high-accuracy transfer of the mechanical and electricity, the laser-trimmed thick-film resistors compensated temperature of the sensor.

Features

- Measuring range: 0-20kPa ~35MPa
- Isolated Construction, suitable for various fluid medium
- Solid, Reliability
- High Accuracy
- Gauge, Absolute and Sealed Reference
- High Resolution
- Constant current or voltage excitation
- Laser trimming and temperature compensation
- Various standard male pressure connections available

Types

• General MPM280

General construction, dimension and sealing, interchangeable with the foreign similar products, applied for the pressure measurements of the media compatible with stainless steel and viton.

• Assembled MPM280

The General MPM280 sensor is installed into a housing with standard or special thread using face type seal or ring seal, The flexible construction can be suitable for various application as the general MPM280 sensor and easily for assembly.

• Flush-diaphragm Design

It is a fully-weld pressure sensor with flush-diaphragm, specially designed for applications in medical, food- and beverage industry. The isolated flush-diaphragm is welded on the front face of G1/2" male pressure port with Viton-ring sealing, it reduces incrustation by the media. Measuring range is 0~100kPa to 7MPa.

• Corrosion-resistant MPM280TH

MPM280TH has excellent corrosion-resistant characteristic with its isolated Tantalum-diaphragm and Hastelloy C (MPM280TH) housing by Viton O-ring sealing, they are available as options specially for corrosive application. Measuring range is 0~100kPa to 7MPa.

All above types of Series MPM280 sensors with range 0~ -100kPa, gauge version are available for measuring the pressure lower than gauge reference.

Specification

(0-20kPa~10MPa) (Supply=1.5mADC, Room Temp.=25±1)

| | Min. | Type. | Max. | Unit |
|-------------------------|------|----------|-------|---|
| ACCURACY (L+H+R) | | | | (Linearity+ Hysteresis Repeatability) |
| ≤0~70kPa | | ±0.10 | ±0.30 | % of FS, BFSL |
| ≥0~100kPa | | ±0.10 | ±0.30 | % of FS, BFSL |
| OUTPUT | | | | |
| Zero Output | | 0±2 | | mVDC |
| FS Output | | ≥70* | | mVDC |
| TEMPERATURE | | | | |
| Zero Temperature Error | | | | |
| ≤0~70kPa | | ±0.75 | ±1.30 | % of FS in reference to 25 |
| ≥100kPa | | ±0.75 | ±1.00 | |
| FS Temperature Error | | | | |
| ≤0~70kPa | | ±0.75 | ±1.00 | % of FS in reference to 25 |
| ≥100kPa | | ±0.75 | ±1.00 | |
| Compensated Temp. Range | | 0~50 | | |
| Operating Temp. Range | | - 40~120 | | |
| Storage Temp. Range | | - 40~120 | | |
| LONG-TERM STABILITY | | 0.2 | 0.5 | ±% of FS per year |

*:Range 0A, FS≥60mV
 Range 0B, FS≥45 mV
 Range 02,03,07,08 Absolute pressure, FS≥60mV
 Version Reference pressure at Vacuum test, FS≥60mV

(0-20MPa~35MPa) (Supply=1.5mA, Room Temp.=25±1)

| | Min | Type. | Max. | Units |
|-------------------------|-----|-------|-------|--------------------------------|
| ACCURACY (L+H+R) | | ±0.15 | ±0.25 | % of FS, BFSL |
| OUTPUT | | | | |
| Zero Output | | ±2 | | mVDC |
| FS Output | | 70 | | mVDC |
| TEMPERATURE | | | | |
| Zero Temperature Error | | | | |
| ±0.5 | | | | ±% of FS in reference to 35 |
| FS Temperature Error | | | | |
| Compensated Temp. Range | | | | |
| 0~80 | | | | |
| Operating Temp. Range | | | | |
| - 40~120 | | | | |
| Storage Temp. Range | | | | |
| - 40~120 | | | | |
| LONG-TERM STABILITY | | 0.2 | 0.5 | ±% of FS per year |

Electrical Specifications

Input Current Excitation: ≤2.0mADC
 Electrical Connection: Φ0.45mm leads or 10.2x52(mm) flexible wire
 Output common mode Voltage: 50% of input
 Input Impedance: 2kΩ~8kΩ
 Output Impedance: 3.5kΩ~6kΩ
 Response Time(10%~90%): ≤1 millisecond
 Insulation Resistance: 100MΩ, 50VDC

Physical specifications

MPM280 Piezoresistive OEM Pressure Sensors

| | |
|---------------------------|--|
| Overpressure: | 2XFS for range: 0-20kPa~10MPa 3XFS for range: 0-20MPa~35MPa |
| Materials of Construction | |
| Diaphragm: | 316L ; Tantalum (optional) |
| Pressure port: | 1Cr18Ni9Ti ; Hastelloy C (optional) |
| O-rings: | Viton |
| Lead: | Gold-plated Kovar |
| Fill Fluid: | Silicon oil <0.5CC |

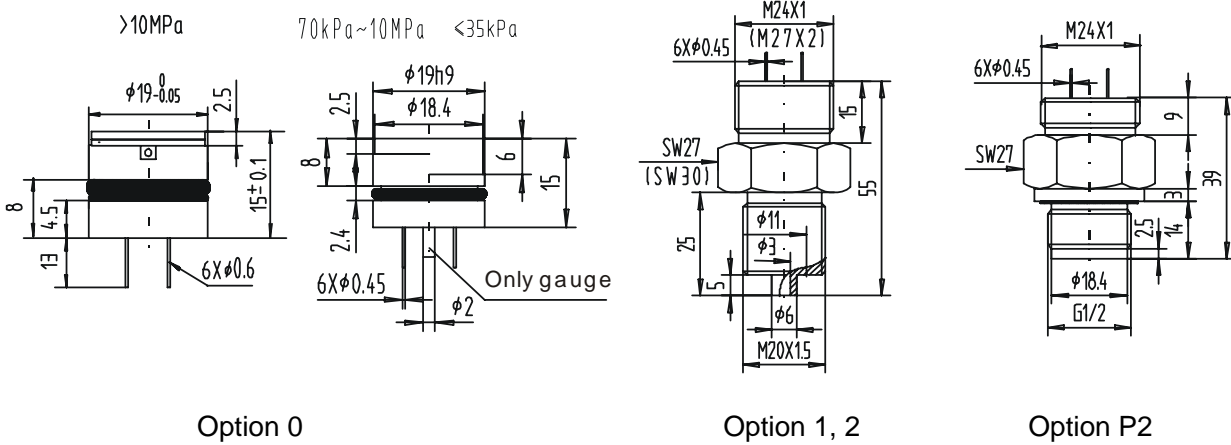
Environmental Conditions

| | |
|-------------------|---|
| Position Effect: | <0.1% of Zero shift for 90° tilt in any direction |
| Vibration Effect: | No change at 10gs' RMS, 20~2000Hz |
| Shock: | 100g, for 10 millisecond |
| Life: | 100 million cycles |

Reference Specifications

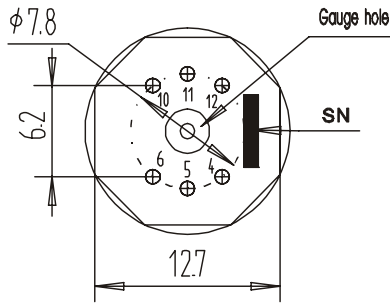
| | |
|----------------------|-----------------|
| Media Temperature: | 25±1 |
| Ambient Temperature: | 25±1 |
| Vibration: | 0.1g(1m/s/s)max |
| Humidity: | 50%±10% |
| Ambient Pressure: | 86~106kPa |
| Excitation Source: | 1.5±0.0015mADC |

Construction (unit:mm)



Electrical Connection

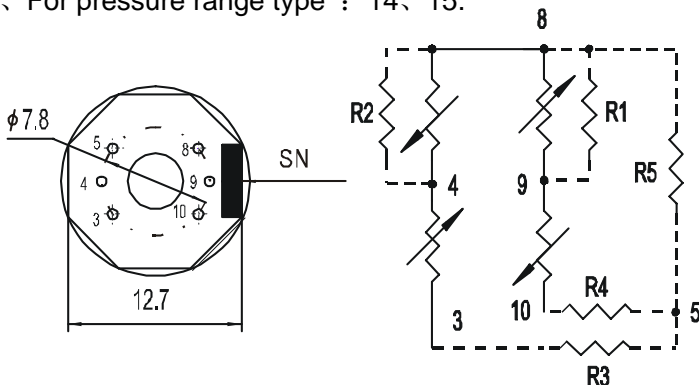
1、 For pressure range type : 0B~13、 17、 18.



(Current Excitation)

| Pin | Connection | Colors |
|-----------------------|------------|---------------|
| 4 | +Output | Red |
| 5 | +IN | Black |
| 6 | -IN | Yellow(White) |
| 10 | -OUT | Blue |
| no use for other pins | | |

2、 For pressure range type : 14、 15.



(Current Excitation)

| Pin | Connection | Colors |
|-----------------------|------------|--------|
| 4 | +Output | Red |
| 5 | -IN | Yellow |
| 8 | +IN | Black |
| 9 | -OUT | Blue |
| no use for other pins | | |

Order Guide

| MPM280(TS/TH)** | | Piezo-resistive Pressure Sensor | | | | | |
|-------------------|---|--|---------------|-------------------------|---------------|---|----------------|
| Code | Pressure range kPa(psi) | Ref. | Code | Pressure range kPa(psi) | Ref. | | |
| 0B | 0~20(0~3) | G | 10 | 0~1000(0~150) | G.S | | |
| 0A | 0~35(0~5) | G | 12 | 0~2000(0~300) | G.S | | |
| 02 | 0~70(0~10) | G.A | 13 | 0~3500(0~500) | G.S | | |
| 03 | 0~100(0~15) | G.A | 14 | 0~7000(0~1000) | S.A | | |
| 07 | 0~200(0~30) | G.A | 15 | 0~10000(0~1500) | S.A | | |
| 08 | 0~350(0~50) | G.A | 17 | 0~20000(0~3000) | S.A | | |
| 09 | 0~700(0~100) | G.A | 18 | 0~35000(0~5000) | S.A | | |
| Code | Pressure type | Code | Pressure type | Code | Pressure type | | |
| G | Gauge | A | Absolute | S | Sealed gauge | | |
| Code | Pressure connection | Installation | | | | | |
| 0 or no selection | O-ring (OEM) | Ø19h9 | | | | | |
| 1 | M20×1.5 male, waterline seal | Top: M24×1 male(only for less than 2MPa) | | | | | |
| 2 | M20×1.5 male, waterline seal | Top: M27×2 male | | | | | |
| P ₂ | G1/2 male, waterline seal | Top: M24×1 male | | | | | |
| Code | Temperature compensation | | | | | | |
| L | Laser trimming compensation | | | | | | |
| M | With outer compensated resistors | | | | | | |
| Code | Electric connection | | | | | | |
| 1 | Ø0.45mm(0.6mm) Kovar pins | | | | | | |
| 2 | 4-color flexible wire, the standard length is 100mm | | | | | | |
| Code | Special measurement | | | | | | |
| Y | Gauge sensor, used to measure vacuum (0~ -100kPa) | | | | | | |
| MPM280 | 09 | G | 0 | L | 1 | Y | The whole spec |

Note : The user could not select pressure connection item, the default for pressure connection is “0”;
 : If the user selects Tantalum diaphragm and stainless steel housing, the type is MPM280TS;if the user selects Tantalum diaphragm and Hastelloy C housing, the type is MPM280TH.
 : For other information, please check the following part.

Attention:

1. Please be sure the max. pressure is less than 80% Full Scale;
2. Please be sure not to shrink range too much, this would affect sensor’s specification;
3. We recommend the user to use Floating for assembling, this would make sensor working best;
4. Please protect the ceramic compensation board and isolated diaphragm. The damage will result in specification worse.