

MPM281 High Stability Pressure Sensor



Features

- Pressure range -100kPa...0kPa~7kPa...100MPa
- Gauge, Absolute, Sealed gauge, Vacuum
- Constant current or constant voltage power supply
- Silicone/Fluorocarbon oil filling options, isolated construction, excellent medium compatibility
- Φ 19mm standard OEM pressure sensor
- Full stainless steel 316L
- Wide temp. compensation range -10°C ~80°C
- Long-term stability $\pm 0.1\%$ FS/Year

Applications

- Industrial process control
- Level measurement
- Gas, liquid pressure measurement
- Pressure gauge
- Pressure calibrator
- Hydraulic system and switches
- HVAC system
- Aviation and navigation inspection

Introduction

MPM281 High Stability Pressure Sensor is a silicon piezoresistive sensitive element with isolated construction and temperature compensation. The sensor uses a high-reliability diffused silicon die encapsulated in a Φ 19mm 316L stainless steel housing. Precision compensation provides a wide temperature range and zero-point calibration. The measured pressure is accurately converted to an electrical signal via an isolated diaphragm. Fluorocarbon oil filling is available. It is tailored for pressure measurement in oxygen-rich conditions. MPM281 Pressure Sensor undergoes rigorous inspection and testing on the automated production line, suitable for demanding pressure measurement conditions.

Electrical Performance

- Power supply: $\leq 2.0\text{mA}$ DC (constant current type)
 $\leq 10\text{V}$ DC (constant voltage type, on request)
- Electrical connection: $\Phi 0.5\text{mm}$ Kovar pin or 100mm silicone wires
- Common mode voltage output: 50% input (typ.)
- Input impedance: $2\text{k}\Omega \sim 8\text{k}\Omega$ (constant current type)
 $4\text{k}\Omega \sim 25\text{k}\Omega$ (constant voltage type)
- Output impedance: $3.5\text{k}\Omega \sim 6\text{k}\Omega$
- Response time (10%~90%): $< 1\text{ms}$

Construction Performance

- Diaphragm: Stainless steel 316L
- Housing: Stainless steel 316L
- Vent tube : Stainless steel 304
- Pin: Gold-plated kovar
- O-ring: FKM
- Net weight: ~16g
- Oil filling: Silicone oil (default)/Fluorocarbon oil

Environmental Conditions

- Vibration: No change at 10gRMS, (20~2000)Hz
- Shock: 100g, 11ms
- Medium compatibility: The gas or liquid which is compatible with stainless steel and FKM

Basic Conditions

- Medium temperature: (35±1)°C
- Ambient temperature: (35±1)°C
- Vibration: 0.1g (1m/s²) Max
- Relative humidity: (50±10)%RH
- Ambient pressure: (86~106)kPa
- Power supply: (1.5±0.0015)mA DC

All specifications were tested under basic conditions.

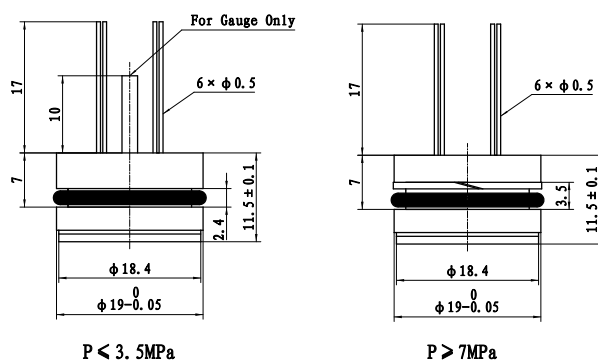
Item	Min.	Typ.	Max.	Units	Notes
Pressure nonlinearity		±0.15	±0.2	%FS, BFS	1
Pressure repeatability		±0.03	±0.075	%FS	
Pressure hysteresis		±0.03	±0.075	%FS	
Zero output		±1.0	±2.0	mV DC	
Constant current output/span	70			mV DC	2
Constant voltage output/span	5		25	mV/V	3
Zero thermal error		±0.5	±1.0	%FS, @35°C	4
Span thermal error		±0.5	±1.0	%FS, @35°C	
Compensation temp. range	0~70			°C (≤35kPa)	
	-10~80			°C (>35kPa)	
Long-term stability error		±0.15	±0.20	%FS/Year (≤100kPa)	
		±0.10	±0.15	%FS/Year (>100kPa)	
Zero thermal hysteresis	±0.2			%FS (≤100kPa)	5
	±0.15			%FS (>100kPa)	
Insulation resistance		250		MΩ@250V DC	6
Lifetime		≥10 million		cycles	
Operating temp. range		-40~125		°C	
Storage temp. range		-40~125		°C	

1. P=35kPa, nonlinearity ≤±0.3%FS
2. Output/Span=full scale output - zero point
P=7kPa, output/span ≥45mV, P=0.7bar, output/span ≥60mV
3. P=7kPa, output /span 3mV/V ~ 6mV/V
4. P=7kPa, zero thermal error≤1.5%FS
5. Within compensation temp. range
6. Insulation resistance was tested under RH≤65% and Temp.≤35 °C .

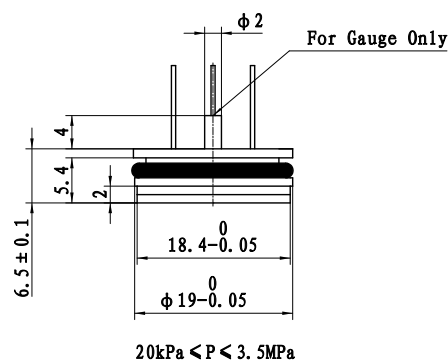
Outline Construction

(Unit: mm)

MPM281 Type

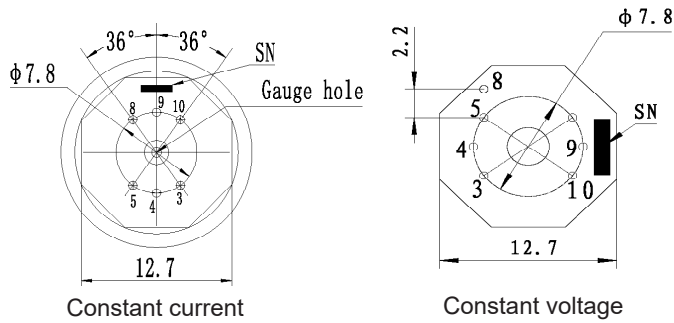


MPM281 Type II

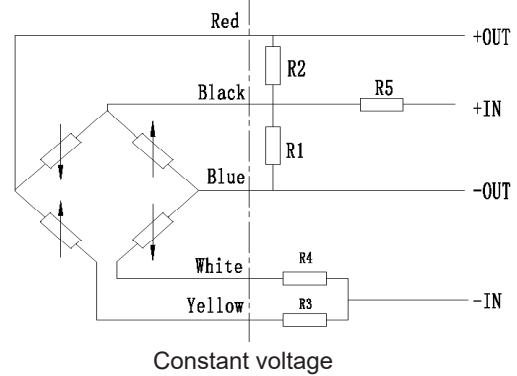
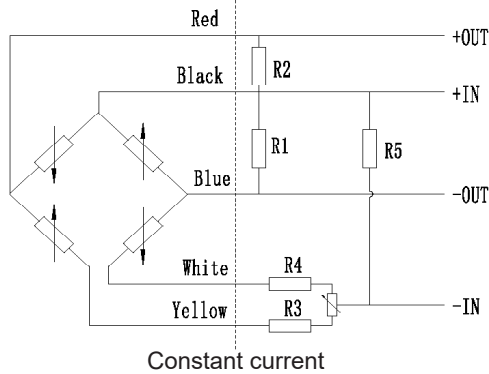


The recommended installation dimension is $\Phi 19^{+0.05}_{+0.02}$ mm

Electrical Connection



Pin	Range code 02/03/17/18/19/20		Other range codes	
	Definition	Wire color	Definition	Wire color
4	-OUT	Blue	+OUT	Red
5	-IN	Yellow	-IN	Yellow
8	+IN	Black	+IN	Black
9	+OUT	Red	-OUT	Blue



Order Guide

MPM281-09-G-F-L-1-P

Code	Size
MPM281	Φ19×11.5mm
MPM281 II	Φ19×6.5mm Range:0kPa ~ 20kPa...3.5MPa

Range code	Pressure range	Ref.	Over-pressure	Burst pressure
0C	0kPa~7kPa	G	250%FS	600%FS
0B	0kPa~20kPa	G	250%FS	600%FS
0A	0kPa~35kPa	G.A	250%FS	600%FS
02	0kPa~70kPa	G.A	200%FS	500%FS
03	0kPa~100kPa	G.A	200%FS	500%FS
07	0kPa~200kPa	G.A	200%FS	500%FS
08	0kPa~350kPa	G.A	200%FS	500%FS
09	0kPa~700kPa	G.A	200%FS	500%FS
10	0MPa~1MPa	G.A	200%FS	500%FS
12	0MPa~2MPa	G.A	200%FS	500%FS
13	0MPa~3.5MPa	G.A.S	200%FS	500%FS
14	0MPa~7MPa	S.A	200%FS	400%FS
15	0MPa~10MPa	S.A	150%FS	300%FS
17	0MPa~20MPa	S.A	150%FS	200%FS
18	0MPa~35MPa	S.A	150%FS	200%FS
19	0MPa~70MPa	S.A	150%FS	200%FS
20	0MPa~100MPa	S.A	110%FS	150%FS

Code*	Potting
Code P	No potting
Code RTV	Potting with silicone RTV gel
* This option is not available for MPM281 II	

Code	Electrical connection
1	Kovar pin
2	100mm silicone wires

Code	Compensation
L	Temperature compensation (1.5mA excitation)
LCV1*	Laser trimming, 10V DC excitation
M	Without temperature compensation, capable of providing resistance compensation value(1.5mA excitation)
* This option is not available for MPM281 II	

Code	Sealing
0	Null
F	FKM O-ring

Code	Pressure type
G	Gauge
A	Absolute
S	Sealed gauge
GY0	Withstand vacuum pressure while Zero at atmospheric pressure
GY	Withstand vacuum pressure while Zero at -100kPa

Notes

1. The default unit of the product is kPa. $1\text{kPa}=0.01\text{bar}$.
2. Zeo shift: Range code 0B can be shifted to -5kPa, -10kPa or -20kPa; 0A can be shifted to -10kPa or -20kPa; 02 can be shifted to -35kPa, -50kPa, or -70kPa; 03~13 can be shifted to -100kPa.
3. It is recommended that the sensor be assembled as a "suspended" construction to avoid direct pressure on its face and affecting sensor stability.
4. Protect the isolated diaphragm and ceramic circuit board to prevent any damage or low performance.
5. The FKM O-ring of sensor has a temperature range of $-20^{\circ}\text{C}\sim 250^{\circ}\text{C}$ by default. For operating temperature below -20°C or harsh media, please contact the MICROSENSOR.

MPM281Pro Pressure Sensor



Features

- Pressure range: 0kPa ~7kPa...3.5MPa
- Nonlinearity: $\pm 0.1\%$ FS
- Gauge, Absolute
- Constant current power supply
- $\Phi 19$ mm standard OEM pressure sensor
- Full Stainless Steel 316L
- Wide compensation temperature range of -20°C ~ 85°C
- Long-term stability: $\pm 0.1\%$ FS/Year
- $3.012\text{V} \pm 1\%$ Interchangeability (gain resistance)

Applications

- Medical devices
- Industrial process control
- Level measurement
- Air refrigeration or compressors
- Pressure transmitters
- Hydraulic system and switches

Introduction

MPM281Pro Pressure Sensor is a high-accuracy, medium-isolated pressure sensitive element, utilizing a highly stable and reliable diffused silicon die that is encapsulated in a 316L stainless steel structure with an outer diameter of $\Phi 19$ mm. Accurate tuning of temperature error and zero output is achieved through an external laser trimming compensation board. Additionally, the gain resistance can be adjusted to provide a net FS output signal of $3.012\text{V} \pm 1\%$.

This product has undergone strict inspection, repeated assessment, and testing on automated production lines. It can be widely used in various high-demand pressure measurement applications.

Electrical Performance

- Power supply: $\leq 2.0\text{mA}$ DC
- Electrical connection: Grey ribbon cable with plug(UL2651-6P,28AWG,2451HM-6P)
- Common mode voltage output: 50% input (typ.)
- Input impedance: $2\text{k}\Omega \sim 8\text{k}\Omega$
- Output impedance: $3\text{k}\Omega \sim 6\text{k}\Omega$
- Response time (10%~90%): $< 1\text{ms}$
- Insulation resistance: $100\text{M}\Omega @ 100\text{V}$ DC
- Overpressure: 2 times FS

Construction Performance

- Diaphragm: Stainless steel 316L
- Housing: Stainless steel 316L
- Vent tube : Kovar alloy
- Outline: Ribbon cable
- O-ring: FKM
- Net weight: About 16g
- Oil filling: Silicone oil

Basic Conditions

- Medium temperature: $(25 \pm 1)^{\circ}\text{C}$
- Ambient temperature: $(25 \pm 1)^{\circ}\text{C}$
- Vibration: 0.1g (1m/s^2) Max
- Humidity: $(50 \pm 10)\%$ RH
- Ambient pressure: $(86 \sim 106)\text{kPa}$
- Power supply: $(1.5 \pm 0.0015)\text{mA}$ DC

Environmental Conditions

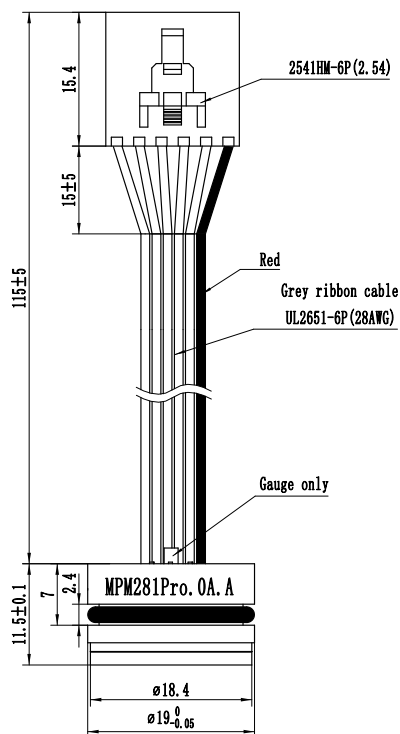
- Vibration: No change at 10gRMS, (20~2000)Hz
- Shock: 100g,11ms
- Medium compatibility: The gas or liquid which is compatible with stainless steel and FKM

Item*	Typ.	Max.	Range	Unit
Pressure nonlinearity**		±0.15	< 35kPa	%FS,BFSL
		±0.10	≥ 35kPa	
Pressure repeatability/hysteresis	±0.02	±0.05		%FS
Zero output		±1.00	> 35kPa	mV DC
		±2.00	≤ 35kPa	
Output/span***	60			mV DC
Zero thermal error		±1.00	≤35kPa	%FS,@25°C
		±1.00	70kPa~100kPa	
		±0.50	> 100kPa	
Span thermal error		±0.75		%FS,@25°C
Span/Zreo thermal hysteresis****	±0.05	±0.10		%FS
Compensation temp. range	0 ~ 50		< 35kPa	°C
	0 ~ 70		35kPa~70kPa	
	-20 ~ 85		> 100kPa	
Operating temp. range		-40 ~ 125		°C
Storage temp. range		-40 ~ 125		°C
Long-term stability error		±0.1		%FS/Year
* Testing under the basic conditions ** P=20kPa NonLinearity ≤ ±0.25%FS *** P=7kPa span ≥45mV,Output/Span=full scale output - zero point **** Over the compensation temperature range with respect to 25°C ,7kPa Span/Zreo thermal hysteresis ≤ ±0.25%FS				

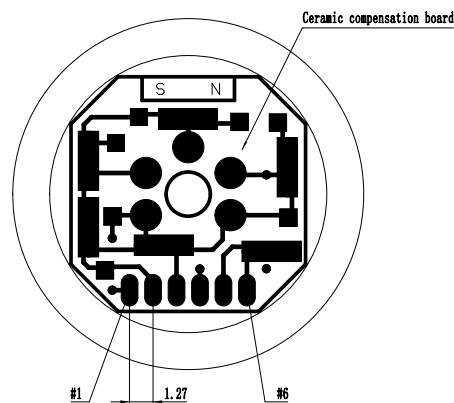
Outline Construction

Unit: mm

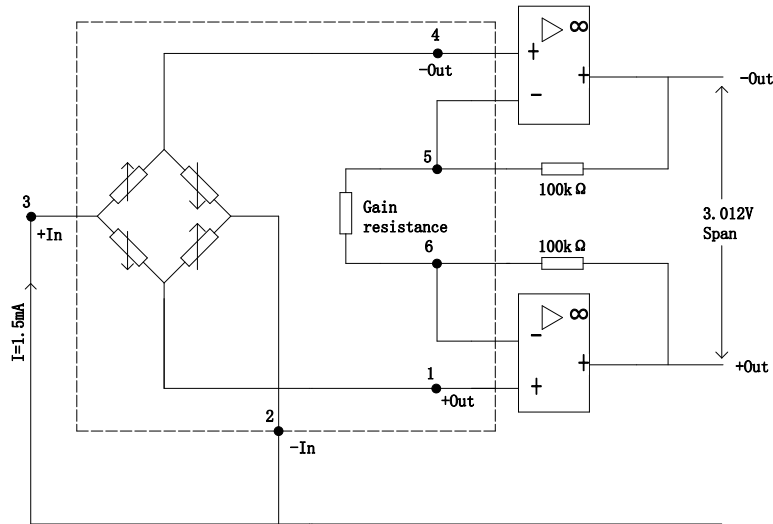
Electrical Connection



The recommended installation dimension is $\Phi 19.0^{+0.05}_{-0.02}$ mm



Pin	Definition	Notes
1	+OUT	#1,#2,#3,#4 mV Output
2	-IN	
3	+IN	
4	-OUT	
5	Gain resistance	#1,#2,#3,#4,#5,#6 Gain Output
6		



Order Guide

MPM281Pro-02-A-F-L-11

Range code	Pressure range	Ref.	Overload pressure	Burst pressure
0C	0kPa~7kPa	G	600%FS	600%FS
0B	0kPa~20kPa	G	600%FS	600%FS
0A	0kPa~35kPa	G.A	1000%FS	1000%FS
02	0kPa~70kPa	G.A	450%FS	450%FS
03	0kPa~100kPa	G.A	300%FS	300%FS
07	0kPa~200kPa	G.A	300%FS	300%FS
08	0kPa~350kPa	G.A	300%FS	300%FS
09	0kPa~700kPa	G.A	300%FS	300%FS
10	0MPa~1MPa	G.A	300%FS	300%FS
12	0MPa~2MPa	G.A	200%FS	200%FS
13	0MPa~3.5MPa	G.A	200%FS	200%FS

Code	Electrical connection
2	100mm silicone wires
11	Grey ribbon cable

Code	Compensation
L	Temperature compensation (1.5mA excitation)

Code	Sealing
F	FKM O-ring

Code	Pressure type
G	Gauge
A	Absolute

Notes

1. The default unit of the product is kPa. 1kPa=0.01bar.
2. It is recommended that the sensor be assembled as a "suspended" construction to avoid direct pressure on its face and affecting sensor stability.
3. Protect the isolated diaphragm and ceramic circuit board to prevent any damage or low performance.

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