

MPM288DI Digital Output Pressure Sensor



Features

- Cost-effective and compact
- Range: -100kPa...0kPa~35kPa...3.5MPa
- Gauge and Absolute
- Dual 24-bit ADC for pressure and temperature data acquisition
- Standard I²C communication protocol
- Dedicated power consumption control pins
- Φ19mm standard OEM pressure sensor
- Full stainless steel 316L

Applications

- Industrial process control
- Level measurement
- Smart pressure gauges
- Gas and liquid pressure measurement
- Medical devices
- IoT

Introduction

MPM288 Digital Output Pressure Sensor is a cost-effective, mass-produced sensitive element with an I²C digital output. It has the same outline, dimensions, and sealing as the international standard sensors, ensuring good interchangeability. This product utilizes a proven pressure core, with a dedicated conditioning chip featuring dual 24-bit ADC for reliable performance. It offers low-power consumption control pins, precise mode control, and network functionality (CS). The supply current is under 100nA in low-power mode, ideal for pressure measurement in conditions with strict power consumption requirements.

Electrical Performance

- Power supply: 3.0V ~ 5.0V DC
- External port: Standard PH2.0-5P
- Output signal: Digital I²C (pressure, temperature)
- Continuous operating current: <3mA DC
- Low-power consumption current: <100nA
- Temperature error: ±2°C
- Pressure error: ±0.2%FS (±0.5%FS@35kPa)
- Total error band: ±1%FS (-10°C ~ 80°C)
- Insulation resistance: 50MΩ@50V DC
- Dielectric strength: 50Hz, 500V AC
- Operating temperature: -10°C ~80°C
- Storage temperature: -25°C ~85°C
- Overpressure: 2.0 × FS
- Burst pressure: 3.0 × FS

Basic Conditions

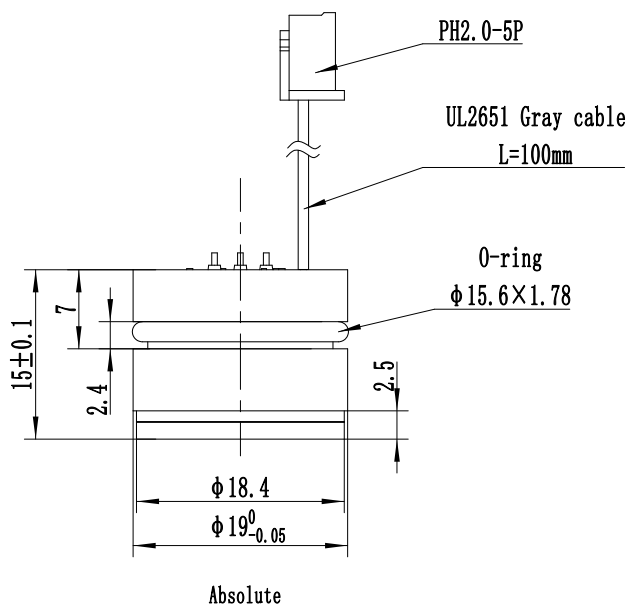
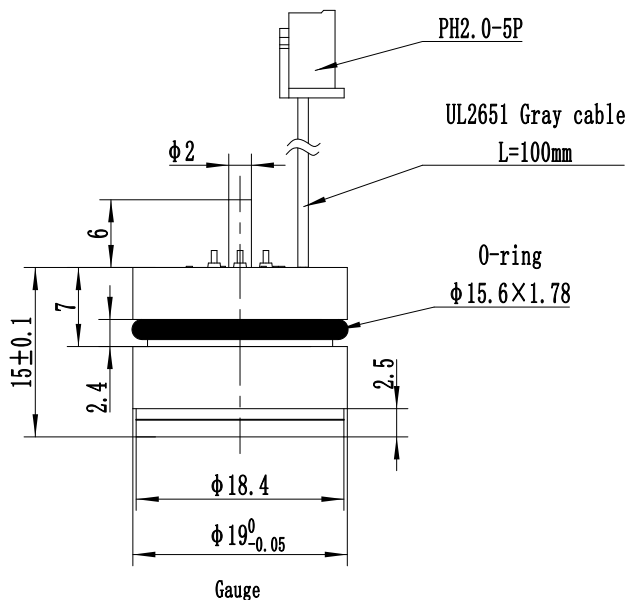
- Medium temperature: (35±1)°C
- Ambient temperature: (35±1)°C
- Vibration: 0.1g (1m/s²) Max
- Relative humidity: (50±10)%RH
- Ambient pressure: (86 ~ 106)kPa
- Power supply: (3.3±0.1)DC

Environmental Conditions

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

Outline Construction

Unit: mm



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

Note:

The inner diameter of the locking ring should not be less than $\Phi 15$ mm.

Construction Performance

- Diaphragm: Stainless steel 316L
- Housing: Stainless steel 316L
- Vent tube: Stainless steel 304
- Plug wire: Standard PH2.0-5P
- O-ring: FKM
- Net weight: ~16g
- Oil filling: Silicone oil

Communication Protocol

The communication mode of MPM288DI pressure sensor is based on the standard I²C communication protocol.

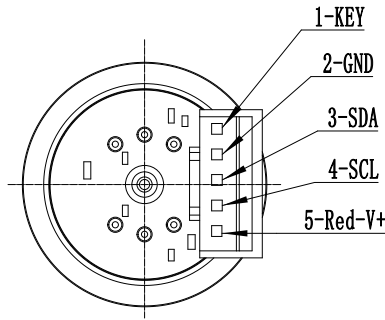
This product has a pin KEY that specifically controls the switching of the operating mode of the product. When the pin is set to a V_{ih} (Input High Level Voltage), the product enters standby mode, in which it is in an "off" state, the ADC operation and I²C communication are not available. When the pin is set to a V_{il} (Input Low Level Voltage), the product enters operating mode, allowing ADC conversion operations and supporting I²C communication access. This control line is similar to the conventional "CS" chip select signal. Based on the above logic, the device address of this product is a unique fixed value and cannot be changed. Its I²C address is as follows (0x6D):

A7	A6	A5	A4	A3	A2	A1	W/R
1	1	0	1	1	0	1	0/1

MPM288DI has dual 24-bit ADC dedicated to the acquisition of pressure and temperature data. The respective data, stored as 8-bit per byte, are stored in on-chip EEPROM registers ranging from 0x06 to 0x0b. Furthermore, the pressure and temperature data are transmitted separately, enabling flexibility and efficiency in the protocol.

The data obtained by the user through the I²C protocol is normalized through temperature compensation and linear correction. This product operates with a wide range of supply voltage (3.0V ~ 5.0V DC). The pressure data is not directly proportional to the supply voltage but corresponds to a percentage of the full-scale value of the 24-bit ADC (where the highest bit represents the sign bit).

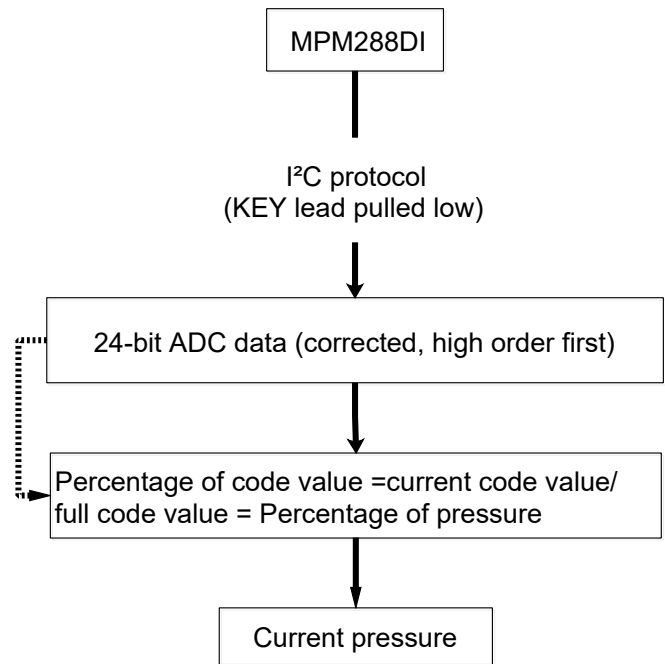
Electrical Connection



Electrical Connection	Cable	Silicone Wire
Low Power Control (KEY)	Gray	Yellow
Negative (GND)	Gray	Black
Data Line (SDA)	Gray	White
Clock Line (SCL)	Gray	Blue
Positive (V+)	Red	Red

Notes

1. The above charts need to be cross-referenced for inquiry.
2. When the KEY lead is set to a V_{ih} , the chip enters the low power consumption mode; When the KEY lead is set to a V_{il} , the chip enters the continuous operating mode.
3. Other wiring and electrical connection (4-wire I²C) are available, please feel free to contact with our sales representatives or call for details.



Data frame structure for MPM288DI pressure sensor
I²C communication is as follows:

Pressure data acquisition

Start	Address_W = 0xda	Ack	Reg_address = 0x06	Ack
Start	Address_R = 0xdb	Ack	Reg_0x06_Value	Ack
	Reg_0x07_Value	Ack	Reg_0x08_Value	No_Ack
				Stop

Temperature data acquisition

Start	Address_W = 0xda	Ack	Reg_address = 0x09	Ack
Start	Address_R = 0xdb	Ack	Reg_0x09_Value	Ack
	Reg_0x0a_Value	Ack	Reg_0x0b_Value	No_Ack
				Stop

Order Guide

MPM288DI-0A-G-F-3/5-0-2

Range code	Pressure range	Ref.
0A	0kPa~35kPa	G.A
02	0kPa~70kPa	G.A
03	0kPa~100kPa	G.A
07	0kPa~200kPa	G.A
08	0kPa~350kPa	G.A
09	0kPa~700kPa	G.A
10	0MPa~1MPa	G.A
12	0MPa~2MPa	G.A
13	0MPa~3.5MPa	G.A.S

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

Code	Electrical connection
2	100mm silicone wires
13	Gray cable with PH2.0-5P

Code	Output type
0	10%~90%
5	5%~95%

Code	Supply voltage
3/5	3.0V~5.0V DC

Code	Sealing
F	FKM O-ring

Notes

1. The default unit of the product is kPa. 1kPa=0.01bar.
2. Zero shift: Range code 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. The listed range represents the product's standard operating range. For special requirements, please contact MICROSENSOR.
4. A wide supply voltage range (3.0V ~ 5.0V DC) is available. The supply voltage specified refers to the typical voltage provided by the system in application.
5. It is recommended that the sensor be assembled as a "suspended" construction to avoid direct pressure on its face and affecting sensor stability.