MPM3801GRF

Operation Manual

MICROSENSOR

Our company reserves the modification right for this operation manual due to renovation of production technology and craftwork. If some information is changed, no more notice will be edited.

Please pay attention to the latest version.

Our company also reserves the right of final explanation for this manual.

Version: V1.0

Thanks for your using products from MICROSENSOR. MPM39801GRF Pressure Transmitter is one of precise instruments. We suggest you to read this manual carefully before use.

1 Introduction

The MPM3801A digital pressure transmitter adopts MPM3801 stainless steel oil-filled sensor as the sensing element, has the stainless-steel housing. Its wetted material is stainless steel, which has excellent corrosion resistance and long-term stability. The sensor is temperature compensated to ensure that the technical parameters such as zero point, sensitivity, linearity and stability are well maintained within the operating temperature range.

The product is beautiful on design、convenient to install，reliable,and widely used in gas measurement industry

2 Specifications

Range：0mbar ~ 70mbar/200mbar/350mbar/700mbar/1bar/ 2bar/3.5bar/5bar/7bar/10bar/16bar/20bar/35bar/70bar

Overpressure：≤2 times FS

Pressure Type：gauge, absolute, sealed gauge

Pressure accuracy：≤±0.25%FS ≤±0.5%FS ≤±1%FS

note：the accuracy is relevant to the range,products with different range can reach different accuracy

Temperature accuracy：±1.5℃(at constant temperature for reference)

Output digital value①：1638（zero）～14746（span）

Output digits：14 bits（maximum digital value16383）

Power supply：3.3±0.1V DC（default）；5±0.1V DC

Energy consumption：5uA（onstage）@25℃

Long-term Stability：±0.2%FS/year

Housing Protection：IP67

Application temperature：-20℃～80℃

Storage temperature：-20℃～85℃

Compensated temperature：-10℃～50℃

Vibration：10g，20Hz～2000Hz

Shock：100g，11ms

Cable length：≤2m

①sensor is 14-bit pressure output, maximum output digital output value is 16383，in order to reserve space for overpressure，10%～90% digital value set as zero and full point, zero，full point 1638 and 14746

3 Outline Construction and Installation

3.1 Construction and Mounting

Unit:mm

Dimension(see Fig. 1 Unit:mm)：

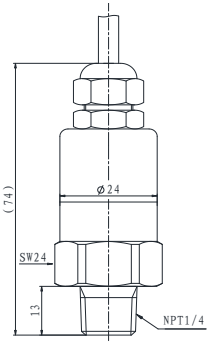


Fig. 1

3.2 Installation

3.2.1 Check before Installation：

a) The measuring pressure is in the measurement range;
b) The measuring medium is compatible with construction;
c) The measuring medium would not jam the pressure-leading hole

3.2.2 Installation Method

Usually the transmitter should be mounted vertically up to the horizontal direction. If the condition is unavailable, the allowed max. mount slope angle from transmitter to the horizontal direction is 30 degree. It is not recommended to mount the transmitter invertedly.

MPM3801GRF digital pressure transmitter can be mounted directly on the flange joint of the measuring pipe. To facilitate installation and maintenance, a shut-off valve should be installed between the flange joint and the pipe, as shown in Figure

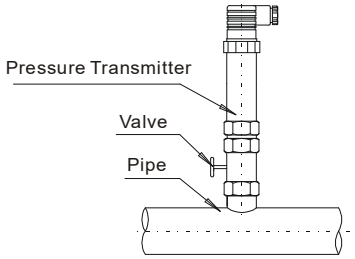


Fig. 2

Do not install the transmitter upside down

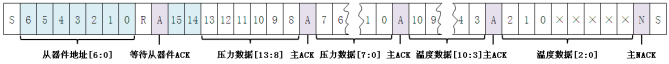
Note: It is strictly forbidden to poke the pressure hole with hard objects such as iron wire and steel needles, and it is not allowed to press the diaphragm by hand, so as not to damage the diaphragm or cause deformation of the diaphragm.

4 Electric Connection

Color	I^2C	SPI
Black	V-	V-
Red	V+	V+
Green	SCL	SCLK
White	SDA	MISO
Yellow	null	SS

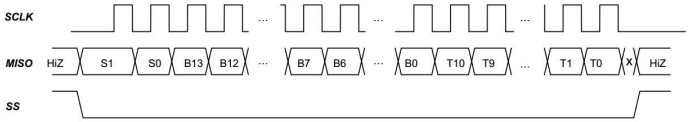
4 I²C measurement data

For reading measurement data. The I²C master sends a 7-bit slave address (default address 0×28H) and bit 8=1 (read), and the sensor sends an acknowledgment signal (ACK) as a slave to indicate that the connection was successful. The slave returns 2 bytes of pressure data and 2 bytes of temperature data to the master（T[10：3]and T[2：0]×××××）。



5 SPI measurement data

The output data consists of 4 bytes (32 bits). The data bits are high in the front and the low bits are in the back. The first two bits of S (1:0) in the first byte are device status bits, which can be used and discarded directly, and the last six bits are the high six bits B (13:8) of the pressure data; The second byte is the low octet B (7:0) of the pressure data; The third byte is the high octet T (10:3) of the temperature data; The first three bits of the fourth byte are the lower three bits of T (2:0) of the temperature data, and the last five bits of the fourth byte are invalid and need to be masked; If the user only needs to read the pressure value, the read operation can be terminated after the second byte. If you also need to read the temperature value, but the resolution is only 8 bits, you can terminate the reading after reading the 3rd byte



data：{{ S(1:0), B(13:8)},{ B(7:0)},{ T(10:3)},

{ T(2:0),XXXXX}}

S(1:0):invalid number，discarded

B(13:8):higher 6 bits of pressure data

B(7:0)：lower 8 bits of pressure data

T(10:3)：higher 8 bits of temperature data

T(2:0)，xxxxx：3rd bits of temperature data and 5 invalid numbers

Hiz：High impedance

6 Unpacking、Components and Storage

6.1Unpacking

First check that the box is intact, the box should be placed according to the "up" sign. If possible, leave the transmitter indoors for a period of time before removing it out of the box.

6.2 Enclosed

The transmitter should be enclosed when out of factory：

MPM3801GRF digital pressure transmitter 1

Cable（assembled to the transmitter） 1.5m or due to the order

Production Manual 1

Production Qualification Certificate 1

6.3 Storage

The transmitter should be stored in a dry and ventilated room with an ambient temperature of -20 °C ~ 85 °C and a relative humidity of not more than 85%, and there is no corrosive gas in the indoor air.

7 Operation、Maintenance and Troubleshooting

7.1 Operation

The user could operate the transmitter without any adjustment. Be sure the installation and electric connection are correct.

The transmitter could work at once as soon as the power is supplied. But the signal output will be more stable after 30 minutes.

7.2 Maintenance

Daily maintenance work must pay attention to the following aspects: please pay attention to the following items in the daily operation:

a Frequently check that the electrical connection is reliable.

b Do not use wires such as wires to poke the pressure holes or use other hard objects to poke the diaphragm.

7.3 Troubleshooting

If the transmitter has no output, the output is too small or too large, the output is unstable and other faults, you should first shut down the power supply, check again whether the installation and wiring meet the requirements of the manual, whether the power supply current is correct,

and whether the ventilation pipe (gauge pressure type) is unobstructed. If it cannot be ruled out, the transmitter may be damaged, please consult our company.

8 Responsibility

Within one year from the delivery date, we shall repair or replace the instrument with any quality fault caused by material parts or our manufacturing technique free of charge. For non-quality malfunction during user's operation, we are in charge of repair. But the material cost and the shuttle transportation fees should be borne by us

Appendix

1.Pressure value calculation formula

Pressure=（full point pressure-zero point pressure）×（pressure digital value-1638）/13108 +zero point pressure

2.temperature calculation formula

Temperature=（temperature digital value/2047）*200 - 50

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