MPM4503
Operation Manual

V2.0

MICROSENSOR

Thank you very much for selecting Micro Sensor's product, please take some time to read this operation manual very carefully before using the product.

1 Introduction

MPM4503 pressure transmitter for pump application is a cost-effective product which adopts micro-fused silicon pressure sensor and special designed amplifier circuit. With linearity correction and temperature compensation, it can effectively resist water hammer effect, solve the problem of momentary overload pressure and also could meet different needs for pressure measurement and control in various environmental conditions. The product is batch produced in automatic production line and all the specifications are strictly controlled. The whole transmitter goes through the strict testing for element, semi-finished and completed product and the aging screening, which makes it more stable and has a good consistency. It can be widely used in the fields like VF constant pressure water supply, compressor, building automation system and water treatment etc.

This product supports cable electrical connection and Packard plug connection, and the standard process connection has G1/4 Male, NPT1/4 Male, NPT1/8 Male and G3/8 Male connection with the rubber sealing gasket.

Products measurement tools type approval No. 15F139-61.

2 Features

Range: 0.3MPa, 1MPa, 1.6MPa, 2MPa，5 MPa Optional

Micro-fused technology

Water hammer resistance and cracking resistance

Compact and cost-effective

Temperature Compensation and Linearity Correction

3 Specifications

Range: 0.3MPa, 1MPa, 1.6MPa, 2MPa，5 MPa Optional

Accuracy: 1.0 (Within compensation temperature)

Zero Thermal Drift: ±0.02%FS/℃

Span Thermal Drift: ±0.02%FS/℃

Over pressure: 2×FS

Burst pressure:10MPa

Supply: 3.3V±0.2 DC / 5V±0.2 DC / 10~28V DC

Output signal: 0.5V~4.5V DC(3-wire) / 0.5V~2.5V DC(3-wire) /

4~20mA(2-wire)/ 10%~90%(I^2C)

Compensation Temp.: 0℃~70℃

Storage Temperature: -20℃~100℃

Insulation Resistance≥100MΩ@250V DC

Media compatibility: compatible with stainless steel 17-4PH 、304and

NBR

Protection: IP67

4 Outline and Installation

4.1 Construction Material

Housing: stainless steel 304

Sensor: stainless steel 17-4PH

O-ring: NBR

Cable: Φ5.0mm PE cable with 3-core

Cable sheath: PA

4.2 Installation

4.3.1 Inspection before installation

a) The measured pressure shall be within the measuring range of transmitter;

b) The measured media shall be compatible with the wetted material;

c) The measured media shall not jam the pressure-leading hole.

4.3.2 Transmitter Installation

MPM4503 pressure transmitter uses thread connection. The transmitter is mounted on the pipeline through the thread connection. It is suitable for the mounting on the hard steel pipe. The thread connection includes G1/4 Male, NPT1/4 Male, NPT1/8 Male and G3/8 Male options. Special sealing gasket also is available.

The maximum torque applied in the process of assembling and disassembling is about (20-35)N•m.

5 Electrical Connection

The transmitter electrical connection adopts the special cable.

Wiring Connection see Table 1

Table 1

Wire Color	3-wire	2-wire	I²C
Red	+V	+V	+IN
Green	+OUT	NULL	SCL
Black	GND	+OUT	-IN
White	NULL	NULL	SDA

6 Read Operations (I²C)

For read operations,the I²C master command starts with the 7bit slave

address (default addr. 0×28H) with the 8thbit = 1 (READ).The

Transducer as the slave sends an acknowledge (ACK)indicating success.

Then 2-byte pressure data and 2-byte temperature data (T[10：3] and

T[2：0]×××××) are returned from slave to master.
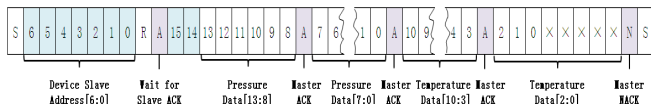
7 Unpacking, Enclosed Shipment and Storage

7.1 Unpacking

Notes:

a) Check whether the package box is in good condition and set it down according to the "Upward" sign;

b) Do not unpack it by force to avoid damaging products.

7.2 Enclosed Shipment

Shipment includes:

MPM4503 Pressure Transmitter   1pc

Operation Manual   1pc

Quality Certificate   1pc

7.3 Storage

The transmitter should be stored in dry and airy room, ambient temperature at -20~100℃ and the relative humidity ≤ 85%, no corrosive substance in the air.

8 Operation and Maintenance

8.1 Operation

a) The transmitter can work without any adjustment.

b) Before operation, please check whether the transmitter is well installed and connected.

c) The transmitter can work after power-on.

8.2 Maintenance

7.2.1 Product Maintenance

MPM4503 pressure transmitter needs regular maintenance to ensure its stable performance and reliability. Please pay attention to the following notes:

The transmitter wiring should be inspected every six months to ensure it is in good condition; The cable outer casing should be well taken care of to make sure there is no sign of ageing.

**Note:** please do not pull the cable by force in the maintenance.

9 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. The material cost and the shuttle transportation fees should be borne by users.

Appendix

1. I²C Interface Parameters

Parameters	Symbol	Min.	Typ.	Max.	Unit
SCLK Clock Frequency	f_{SCL}	100		400	kHz
Start Condition Hold Time Relative To SCL Edge	t_{HDSTA}	0.1			us
Minimum SCL Clock Low Width	t_{LOW}	0.6			us
Minimum SCL Clock High Width	T_{HIGH}	0.6			us
Start Condition Setup Time Relative To SCL edge	t_{SUSTA}	0.1			us
Data Hold Time On SDA Relative To SCL Edge	t_{HDDAT}	0			us
Data Setup Time On SDA Relative To SCL Edge	t_{SUDAT}	0.1			us
Stop Condition Setup Time On SCL	t_{SUSTO}	0.1			us
BUS Free Time Between Stop And Start Condition	t_{BUS}	2			us
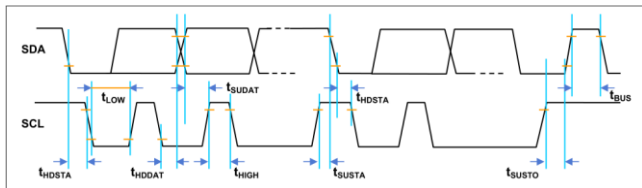
2. Transducer Pressure Output at Significant Percentages

%output	Digital Counts (decimal)	Digital Counts (hex)
0	0	0×0000
5	819	0×0333
10	1638	0×0666
50	8192	0×2000
90	14746	0×399A
95	15563	0×3CCB
100	16383	0×3FFF

3. Transducer Temperature Digital Output

Output ℃	Digital Counts (decimal)	Digital Counts (hex)
-50	0	0×0000
0	512	0×0200
10	614	0×0266
25	767	0×02FF
40	921	0×0399
85	1381	0×0565
150	2047	0×07FF

4. Pressure Calculating Formula

10%~90% output: pressure= (FS pressure - Zero pressure) * (Pressure applied-1638) /13108+ Zero pressure

5%~95% output: pressure= (FS pressure - Zero pressure) * (Pressure applied-819) /14744+ Zero pressure

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