High Accuracy Analog Output Pressure Transmitter

MPM480

Applications

- Mechanical manufacturing
- Hydraulic and pneumatic control technology
- Marine industry
- Petroleum and petrochemical industry
- Natural gas industry
- Municipal and environmental engineering

Features

- Support reversed-polarity, overcurrent and overvoltage protection, conforming EMI protection requirements
- Intrinsic safety type, Ex ia IIC T6 Ga
- Explosion-proof type, Ex d IIC T6 Gb
- CE, RoHS and CCS approved

Introduction

MPM480 Pressure Transmitter utilizes a stainless steel isolated piezoresistive OEM pressure sensor as the signal measuring element. It is available fore a wide temperature compensation by using automat ic computer test and laser trimming technology. It includes a signal processing circuit that is housed in a stainless steel housing and converts the milli-volt signal into a standard output signal. A regid testing and screening is required in the whole manufacturing process of the product from the original components, semi-finished to the final finished product for stable and reliable performance. The transmitter undergoes stringent testing and aging at every stage—components, semi-finished, and finished products—ensuring stable and reliable performance.

Specifications

Range	-100kPa…0kPa ～ 10kPa…100MPa
Pressure type	Gauge G, Absolute A, Sealed Gauge S, Positive/ Negative N
Accuracy	Refer to"Measuring Range & Accuracy Table"
Long-term stability	±0.2%FS/year
Operating temperature	-30°C ~ 80°C (B1, B3)
	-20°C~ 70°C (B2, cable material: PE, PVC)
	-20°C~ 80°C(B2, cable material: PUR)
	-10°C ~ 60°C (Intrinsically safe explosion-proof)
	-20°C～ 60°C (Flameproof)
Storage temperature	-40°C ~120°C
	-20°C ~ 85°C (B2)
Vibration	10g, 55Hz ～ 2000Hz
Shock	100g, 11ms
IP rating	IP65
Weight	≤ 375g

Measuring Range & Accuracy Table

Gauge Pressure G

Unit	Measuring Range	Accuracy	Overpressure	Code
kPa	0 - 7	±1%FS	15	K007
	0 - 10		20	K010
	0 - 20	±0.5%FS	40	K020
	0 - 25		50	K025
	0 - 40		100	K040
	0 - 50		100	K050
	0 - 60		100	K060
	0 - 70		100	K070
	0 - 80		200	K080
	0 - 90		200	K090
	0 - 100		200	K100
	0 - 160	±0.25%FS	300	K160
	0 - 200		400	K200
	0 - 250		500	K250
	0 - 300		600	K300
	0 - 400		1000	K400
	0 - 500		1000	K500
	0 - 600		1000	K600
	0 - 700		1400	K700
	0 - 800		1600	K800
	0 - 900		1800	K900
MPa	0 - 1	±0.25%FS	2	M1D0
	0 - 1.6		3	M1D6
	0 - 2		4	M2D0
	0 - 2.5		5	M2D5
	0 - 3		6	M3D0
	0 - 3.5		6	M3D5
psi	0 - 1.5	±1%FS	3	P1D5
	0 - 3	±0.5%FS	6	P003
	0 - 5		10	P005
	0 - 10		15	P010
	0 - 15		20	P015
	0 - 30	±0.25%FS	45	P030
	0 - 60		150	P060
	0 - 100		150	P100
	0 - 160		300	P160
	0 - 200		300	P200
	0 - 300		450	P300
	0 - 500		750	P500

Unit	Measuring Range	Accuracy	Overpressure	Code
	0 - 70	±1%FS	150	m070
mbar	0 - 100		200	m100
	0 - 200	±0.5%FS	500	m200
	0 - 250		500	m250
	0 - 400		1000	m400
	0 - 500		1000	m500
	0 - 600		1200	m600
	0 - 700		1400	m700
	0 - 800		1600	m800
	0 - 900		1800	m900
bar	0 - 1	±0.5%FS	2	B001
	0 - 1.6	±0.25%FS	3	B1D6
	0 - 2		4	B002
	0 - 2.5		5	B2D5
	0 - 3		6	B003
	0 - 4		10	B004
	0 - 5		10	B005
	0 - 6		10	B006
	0 - 7		14	B007
	0 - 8		16	B008
	0 - 9		18	B009
	0 - 10		20	B010
	0 - 16		30	B016
	0 - 20		40	B020
	0 - 25		50	B025
	0 - 30		60	B030
	0 - 35		60	B035

Sealed Gauge Pressure S

Unit	Measuring Range	Accuracy	Overpressure	Code
MPa	0 - 3.5	±0.25%FS	7	M3D5
	0 - 4		10	M4D0
	0 - 5		10	M5D0
	0 - 6		10	M6D0
	0 - 7		10	M7D0
	0 - 8		15	M8D0
	0 - 9		15	M9D0
	0 - 10		15	M010
	0 - 16		30	M016
	0 - 20		30	M020
	0 - 25		37.5	M025
	0 - 30		45	M030
	0 - 35		52.5	M035
	0 - 40		60	M040
	0 - 50		75	M050
	0 - 60		90	M060
	0 - 70		100	M070
	0 - 80		100	M080
	0 - 90		100	M090
	0 - 100		110	M100
bar	0 - 35	±0.25%FS	70	B035
	0 - 40		100	B040
	0 - 50		100	B050
	0 - 60		100	B060
	0 - 70		100	B070
	0 - 80		150	B080
	0 - 90		150	B090
	0 - 100		150	B100
	0 - 160		300	B160
	0 - 200		300	B200
	0 - 250		450	B250
	0 - 300		525	B300
	0 - 350		375	B350
	0 - 400		600	B400
	0 - 500		750	B500
	0 - 600		900	B600
	0 - 700		1000	B700
	0 - 800		1000	B800
	0 - 900		1000	B900
	0 - 1000		1100	B01K
psi	0 - 500	±0.25%FS	750	P500
	0 - 600		1500	P600
	0 - 700		1500	P700
	0 - 800		1500	P800
	0 - 900		1500	P00
	0 - 1000		1500	P01K
	0 - 2000		3000	P02K
	0 - 3000		4500	P03K
	0 - 4000		6000	P04K
	0 - 5000		7500	P05K
	0 - 6000		9000	P06K
	0 - 7000		10500	P07K
	0 - 8000		12000	P08K
	0 - 9000		13500	P09K
	0 - 10000		15000	P10K

Absolute Pressure A

Unit	Measuring Range	Accuracy	Overpressure	Code
kPa	0 - 40	±1%FS	100	K040
	0 - 50		100	K050
	0 - 60		100	K060
	0 - 70		100	K070
	0 - 80		200	K080
	0 - 90		200	K090
	0 - 100		200	K100
	0 - 160	±0.5%FS	300	K160
	0 - 200		400	K200
	0 - 250		500	K250
	0 - 300		600	K300
	0 - 400		1000	K400
	0 - 500		1000	K500
	0 - 600		1000	K600
	0 - 700		1400	K700
	0 - 800		1600	K800
	0 - 900		1800	K900
MPa	0 - 1	±0.5%FS	2	M1D0
	0 - 1.6	±0.25%FS	3	M1D6
	0 - 2		4	M2D0
	0 - 2.5		5	M2D5
	0 - 3		6	M3D0
	0 - 3.5		6	M3D5
	0 - 4		6	M4D0
	0 - 5		10	M5D0
	0 - 6		10	M6D0
	0 - 7		14	M7D0
	0 - 8		16	M8D0
	0 - 9		18	M9D0
	0 - 10		20	M010
	0 - 16		30	M016
	0 - 20		30	M020
	0 - 25		37.5	M025
	0 - 30		45	M030
	0 - 35		52.5	M035
	0 - 40		60	M040
	0 - 50		75	M050
	0 - 60		90	M060
	0 - 70		100	M070
	0 - 80		100	M080
	0 - 90		100	M090
	0 - 100		110	M100
mbar	0 - 400	±1%FS	1000	m400
	0 - 500		1000	m500
	0 - 600		1200	m600
	0 - 700		1400	m700
	0 - 800		1600	m800
	0 - 900		1800	m900

Unit	Measuring Range	Accuracy	Overpressure	Code
bar	0-1	±0.5%FS	2	B001
	0-1.6		3	B1D6
	0-2		4	B002
	0-2.5		5	B2D5
	0-3		6	B003
	0-4		10	B004
	0-5		10	B005
	0-6		10	B006
	0-7		14	B007
	0-8		16	B008
	0-9		18	B009
	0-10		20	B010
	0-16	±0.25%FS	30	B016
	0-20		40	B020
	0-25		50	B025
	0-30		60	B030
	0-35		60	B035
	0-40		100	B040
	0-50		100	B050
	0-60		100	B060
	0-70		140	B070
	0-80		160	B080
	0-90		180	B090
	0-100		200	B100
	0-160		300	B160
	0-200		300	B200
	0-250		375	B250
	0-300		350	B300
	0-350		525	B350
	0-400		600	B400
	0-500		750	B500
	0-600		900	B600
	0-700		1000	B700
	0-800		1000	B800
	0-900		1000	B900
	0-1000		1100	B01K
psi	0 - 5	±1%FS	10	P005
	0 - 10		15	P010
	0 - 15		20	P015
	0 - 30	±0.5%FS	45	P030
	0 - 60		150	P060
	0 - 100		150	P100
	0 - 160		300	P160
	0 - 200	±0.25%FS	300	P200
	0 - 300		450	P300
	0 - 400		750	P400
	0 - 500		750	P500
	0 - 600		1500	P600
	0 - 700		1500	P700
	0 - 800		1500	P800
	0 - 900		1500	P900
	0 - 1000		1500	P01K
	0 - 2000		3000	P02K
	0 - 3000		4500	P03K
	0 - 4000		6000	P04K
	0 - 5000		7500	P05K
	0 - 6000		9000	P06K
	0 - 7000		10500	P07K
	0 - 8000		12000	P08K
	0 - 9000		13500	P09K
	0 - 10000		15000	P10K

Positive/Negative Pressure N

Unit	Measuring Range	Accuracy	Overpressure	Code
kPa	- 25 - 0	±1%FS	50	V025
	- 40 - 0		100	V040
	- 60 - 0		100	V060
	- 100 - 0		150	V100
	- 3 - +3		10	C033
	- 5 - +20		30	C520
	- 5 - +25		30	C525
	- 15 - +15		30	C015
	- 20 - +20		30	C020
	- 25 - +25		50	C025
	- 30 - +30		50	C030
	- 50 - +50		100	C050
	- 100 - +60		150	C16B
	- 100 - +100		300	C11B
	- 100 - +150		300	C1B5
	- 100 - +300	±0.5%FS	500	C13B
	- 100 - +500		1000	C15B
	- 100 - +900		2000	C19B
	- 100 - +1000		2500	C11K
	- 100 - +1500		3000	C1K5
	- 100 - +1600		3000	C1K6
	- 100 - +2000		3000	C12K
	- 100 - +2400		5000	C24K
	- 100 - +2500		5000	C25K
	- 100 - +3000		6000	C30K
	- 100 - +3500		7000	C35K

Unit	Measuring Range	Accuracy	Overpressure	Code
bar	- 0.25 - 0	±1%FS	0.5	VD25
	- 0.4 - 0		1	V0D4
	- 0.6 - 0		1	V0D6
	- 1 - 0		1.5	V1D0
	- 0.03 - +0.03		0.1	C0D3
	- 0.05 - +0.2		0.3	C052
	- 0.05 - +0.25		0.3	C5D5
	- 0.15 - +0.15		0.3	CD15
	- 0.2 - +0.2		0.3	C0D2
	- 0.25 - +0.25		0.5	CD25
	- 0.3 - +0.3		0.5	C003
	- 0.5 - +0.5		1	C005
	- 1 - +0.6		1.5	C0D6
	- 1 - +1		2	C101
	- 1 - +1.5		3	C1D5
	- 1 - +3	±0.5%FS	5	C103
	- 1 - +5		10	C105
	- 1 - +9		20	C109
	- 1 - +10		25	C110
	- 1 - +15		30	C115
	- 1 - +16		30	C116
	- 1 - +20		30	C120
	- 1 - +24		50	C124
	- 1 - +25		50	C125
	- 1 - +30		60	C130
	- 1 - +35		70	C135

psi	-15 - 0	±1%FS	20	PF00
	-15 - +10		20	PF10
	-15- +15		45	PF15
	-15- +30	±0.5%FS	150	PF30
	-15 - +50		150	PF50
	-15 - +80		300	PF80
	-15- +100		300	PF1B
	-15 - +150		450	P1B5

Test standard: GB/T 17614.1-2015/IEC60770-1:2010;
Ambient temperature: 20°C ± 5°C
Relative humidity: 45% ～ 75%

For other measurement ranges, please contact MICROSENSOR.

Thermal Error

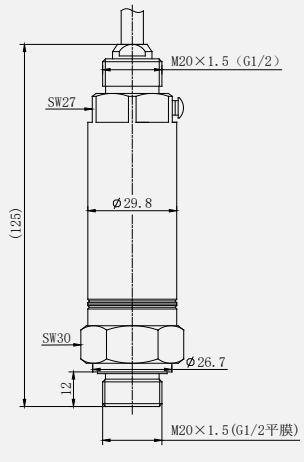
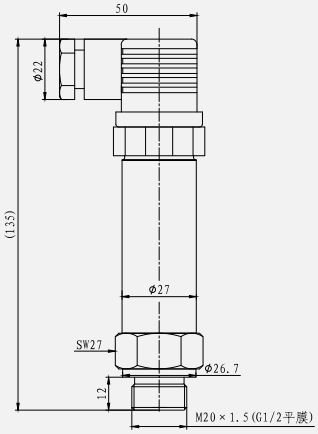
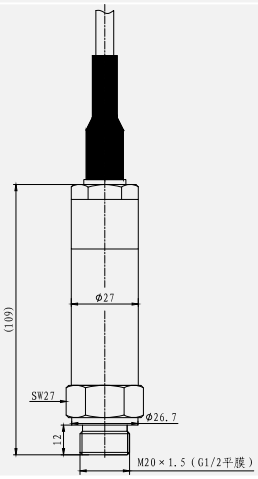
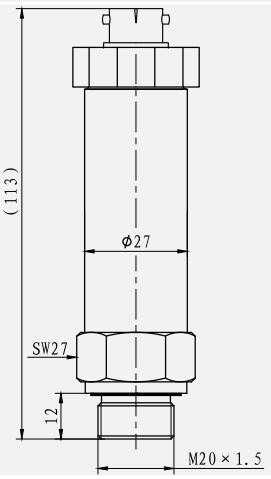
Zero thermal error	±0.03%FS/℃（≤ 100kPa）
	±0.02%FS/℃（＞ 100kPa）
Span thermal error	±0.03%FS/℃（≤ 100kPa）
	±0.02%FS/℃（＞ 100kPa）

Output Signals

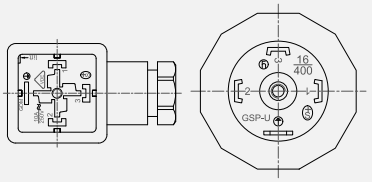
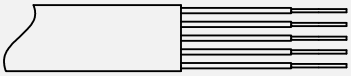
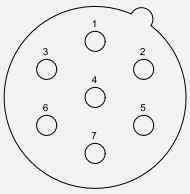
Output Signal	Supply Voltage	Output Type	Load Resistance
4mA~20mA DC(E)	15V~28V DC (Intrinsically safe, powered by safety barrier	2-wire	≤(U-15)/0.02(Ω)
0mA~10mA DC(Q)		3-wire	＞ 100 kΩ
0mA~20mA DC(U)			
0V~5V DC(J)			
1V~5V DC(F)			
0V~10V DC(V)			

Outline Construction

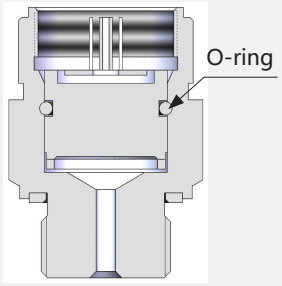
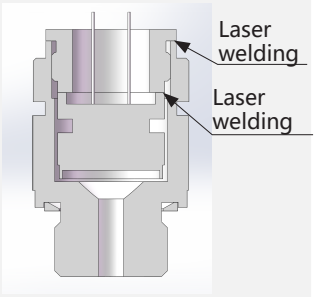
Unit: mm

Flameproof (d)	4-pin Connector (B1)	Cable (B2)	7-pin Connector (B3)
			

Electrical Connection

Definition	4-pin Connector (B1)		Cable (B2)		7-pin Connector (B3)	
						
	Current 2-wire	Voltage 3-wire	Current 2-wire	Voltage 3-wire	Current 2-wire	Voltage 3-wire
(+V)	1	1	Red	Red	1	1
(+OUT)/(-V)	2	3	Black	White	2	4
(GND)	Null	2	Null	Black	Null	2

Sensor Sealing

O-ring (FKM / EPDM)	Welding
	

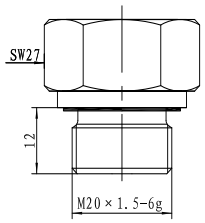
Construction Materials

Wetted parts
Isolated diaphragm: SS 316L/ Tantalum/Titanium
Pressure port: SS 304/SS 316L/Hastelloy C/Titanium
Non-wetted parts
Housing: SS 304/ SS 316L/Titanium
Cable: PE/PUR

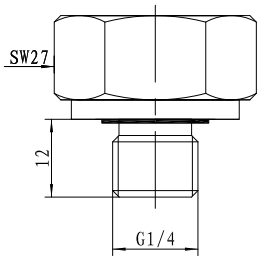
Process Connection

Unit: mm

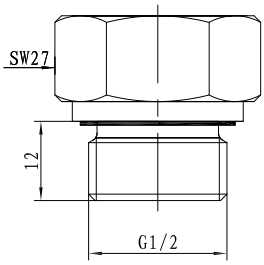
M20× 1.5 Male, face seal (C1)



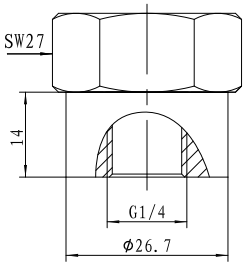
G1/4 Male, face seal (C2)



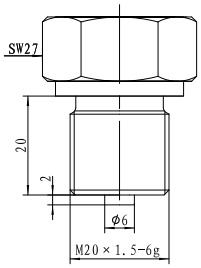
G1/2 Male, face seal (C3)



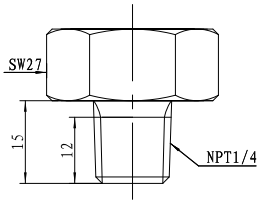
G1/ 4 Female, waterline seal (C4)



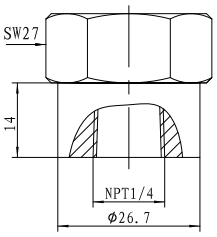
M20×1.5 Male, Waterline (C5)



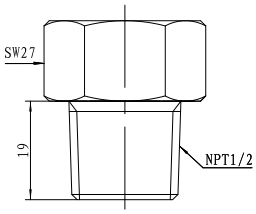
NPT1/4 Male (C6)



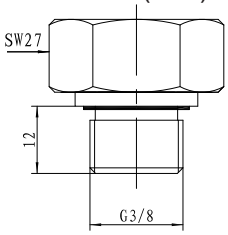
NPT1/ 4 Female (C8)



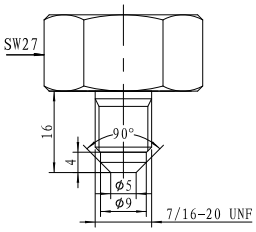
NPT1/2 Male (C10)



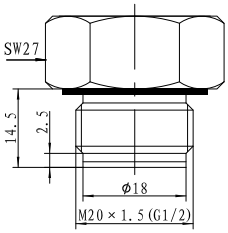
G3/ 8 Male, waterline seal (C16)



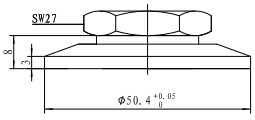
7/16- 20 UNF Male, 90° cone seal (C26)



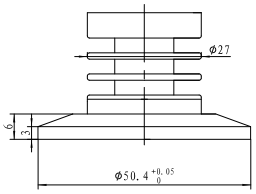
M20×1.5 or G1/2 flush diaphragm (PC1/PC3)



DN25 Clamp (PD1)



DN25 Clamp connection with heat sink (PD1s)



Order Guide

MPM480	Pressure Transmitter

Code	Pressure type
G	Gauge/Sealed gauge pressure
S	
A	Absolute pressure
N	Negative pressure

Range	Measuring range -100kPa…0kPa ～ 10kPa…100MPa
XXXX	Range-specific code

Code	Output signal
E	4mA~20mA DC
Q	0mA~10mA DC
U	0mA~20mA DC
J	0V~5V DC
F	1V~5V DC
V	0V~10V DC

Code	Power supply
V13	15V-28V DC

Code	Accuracy
A1	±0.25%FS
A2	±0.5%FS
A3	±1%FS

Code	Construction material		
	Isolated diaphragm	Pressure port	Housing
22	SS 316L	SS 304	SS 304
23	SS 316L	SS 316L	SS 304
24	SS 316L	SS 316L	SS 316L
25	Tantalum Ta1	SS 316L	SS 304
35	Tantalum Ta1	Hastelloy C	SS 304
40	Titanium TA1	Titanium TC4	Titanium TC4

Code	Sensor sealing
00	FKM (standard)
01	EPDM (optional by operating temp. and medium compatibility)
02	Welding (optional by operating temp. and medium compatibility)
03	Integral sintering (optional only for PC1, PC3, PD1, and PD1s)

Code	Process connection	
C1	M20× 1.5 Male, face seal	
C2	G1/4 Male, face seal	
C3	G1/2 Male, face seal	
C4	G1/ 4 Female	
C5	M20×1.5 Male, waterline seal	
C6	NPT1/4 Male	
C8	NPT1/ 4 Female	
C10	NPT1/2 Male	
C16	G3/8 Male, face seal	
C26	7/16-20 UNF Male, 90° cone seal	
PC1	Flush diaphragm M20× 1.5 Male	0kPa ～ 40kPa…35MPa
PC3	Flush diaphragm G1/ 2 Male	
PD1	Hygienic DN25 clamp connection	
PD1S	Hygienic DN25 clamp connection with heat sink	0kPa ～ 40kPa…3.5MPa

MPM480	G	M1D6	E	V13	A1	22	00	C1	The complete spec.

Order Guide

Code	Process connection sealing
N	None (not optional for C4, C6, C8, C10, C26, PD1, and PD1s)
1	NBR
2	FKM (standard)
3	EPDM
4	Copper (C5 required)

Code	Electrical connection	
B1	4-pin connector	
B11	4-pin Connector with 1.5 m PVC cable	
B2	Cable	
B21	Cable connection with M20×1.5 fixed thread	Flameproof only, select one
B22	Cable connection with NPT1/ 2 fixed thread	
B23	Cable connection with G1/ 2 fixed thread	
B3	7-pin connector	
B31	7-pin connector with 1.5 m PVC cable	

Code	Cable material (optional only for B2 cable)
N	None (non-cable connection option)
P1	PVC
P2	PUR

Code	Cable length (Unit: m)
N	None (non-cable connection option)
L01	1
L1.5	1.5
L02	2
L03	3
L04	4
L05	5
L06	6
L07	7
L08	8
L09	9
L10	10

Code	Certification requirement ①
N	None
i	Intrinsically safe explosion-proof Ex ia IICT6 Ga
T	Ship-use
d	Flameproof Ex db IICT6 Gb

Code	Accessory
N	No accessories required
M6	M6 digital indicator (only for 4mA ~ 20mA DC output non- explosion proof or non-ship-use products with B1 electrical connection)
M7	M7 digital indicator (only for 4mA ~ 20mA DC output non- explosion proof or non-ship-use products with B1 electrical connection)
Yb3	Yb junction box (3-core terminals)
Yc3	MS200 (3-core terminals)
Yd	PD140
YeM6	Ye（M6）
YeM7	Ye（M7）
Ye	Ye (Without indicator)
MS01	Polymer plug
D01	Damping gasket

2	B2	P1	L10	N	Ye	The complete spec.

Notes

1. " ① " refers to certification requirements. The details are:
   For the intrinsically safe explosion-proof type, current output is available only.
   The product can be intrinsically safe explosion-proof/flameproof and suitable for ship-use simultaneously.
2. Refer to the "Measuring Range" on page 2 for product accuracy.
3. The sensor O-ring material options are FKM and EPDM. The minimum operating temperature for FKM is -20°C, while for EPDM, it is -40°C.
4. When ordering the transmitter with M6 or M7 indicator, power supply should ≥20V DC.
5. The ambient temperature of transmitter should be -20°C~ 70°C with M6 indicator, while -10°C~ 60°C with M7 indicator. Indicator settings refer to its order guide, which can be obtained from the MICROSENSOR website.
6. If a metrology verification certificate is required, or there are any other special requirements, please consult with the MICROSENSOR and specify them in the order.