

# MPM3801 I<sup>2</sup>C Digital Output Pressure Sensor



## Features

- Gauge, absolute and sealed gauge pressure
- Isolated construction applicable to measure various fluid
- Standard size, versatile applications

## Introduction

MPM3801 Digital Output Pressure Sensor is an oil-filled OEM pressure sensitive element with stainless steel corrugated diaphragm isolation. The measured pressure is transmitted through the isolation diaphragm and silicone oil to a precision silicon pressure-sensitive chip with a Wheatstone bridge, ensuring accurate pressure-to-analog signal conversion. The signal is then temperature-compensated and nonlinear-corrected by a custom integrated circuit, outputting pressure and temperature data by I<sup>2</sup>C or SPI protocols. With digital normalized output and low power consumption, the sensor easily integrates with various devices and offers broad applicability. It is ideal for fluid pressure measurements compatible with stainless steel and FKM.

## Specifications

- Range: -100kPa...0kPa - 7kPa...100MPa
- Pressure type: Gauge, absolute, sealed gauge, negative pressure
- Overload: 1.5 times FS or 110MPa (min.value is valid)
- Accuracy: Refer to "Measuring Range & Accuracy Table"
- Digital output: 1638 (zero) ~ 14746 (span)
- Output bits: 14 bits (Max. digital counts 16383)
- Power supply: 3.3V±0.1V DC (default) ; 5V±0.1V DC
- Power consumption: 5µA (standby) @25°C
- Long-term stability: ±0.2%FS/year
- Operation temperature: -20°C ~ 80°C
- Storage temperature: -40°C~ 125°C
- Compensation temperature: -10°C~ 50°C
- Vibration: 10g, 20Hz~2000Hz
- Shock: 100g, 11ms

## Measuring Range & Accuracy Table

### Gauge Pressure G

Unit	Measuring Range	Accuracy	Overpressure	Code	Unit	Measuring Range	Accuracy	Overpressure	Code
kPa	0 - 7	±1%FS	15	K007	mbar	0 - 70	±1%FS	150	m070
	0 - 10		20	K010		0 - 100		200	m100
	0 - 20		40	K020		0 - 200		500	m200
	0 - 25		50	K025		0 - 250		500	m250
	0 - 40		100	K040		0 - 400		1000	m400
	0 - 50	100	K050	±0.5%FS		0 - 500	1000	m500	
	0 - 60	100	K060			0 - 600	1200	m600	
	0 - 70	100	K070			0 - 700	1400	m700	
	0 - 80	200	K080			0 - 800	1600	m800	
	0 - 90	200	K090			0 - 900	1800	m900	
	0 - 100	200	K100	bar	0 - 1	±0.25%FS	2	B001	
	0 - 160	300	K160		0 - 1.6		3	B1D6	
	0 - 200	400	K200		0 - 2		4	B002	
	0 - 250	500	K250		0 - 2.5		5	B2D5	
	0 - 300	600	K300		0 - 3		6	B003	
	0 - 400	1000	K400		0 - 4		10	B004	
	0 - 500	1000	K500		0 - 5		10	B005	
	0 - 600	1000	K600		0 - 6		10	B006	
	0 - 700	1400	K700		0 - 7		14	B007	
	0 - 800	1600	K800		0 - 8		16	B008	
0 - 900	1800	K900	0 - 9	18	B009				
MPa	0 - 1	±0.25%FS	2	M1D0	0 - 10	20	B010		
	0 - 1.6		3	M1D6	0 - 16	30	B016		
	0 - 2		4	M2D0	0 - 20	40	B020		
	0 - 2.5		5	M2D5	0 - 25	50	B025		
	0 - 3		6	M3D0	0 - 30	60	B030		
	0 - 3.5		6	M3D5	0 - 35	60	B035		
psi	0 - 1.5	±1%FS	3	P1D5	psi	0 - 10	±0.5%FS	15	P010
	0 - 3		6	P003		0 - 15		20	P015
	0 - 5		10	P005		0 - 30		45	P030
	0 - 10	±0.25%FS	150	P060		0 - 60	150	P100	
	0 - 15		20	P015		0 - 100	150	P100	
	0 - 30		45	P030		0 - 160	300	P160	
	0 - 60		150	P060		0 - 200	300	P200	
	0 - 100		150	P100		0 - 300	450	P300	
	0 - 160		300	P160		0 - 500	750	P500	
	0 - 200		300	P200					
	0 - 300		450	P300					
0 - 500	750	P500							

## Sealed Gauge Pressure S

Unit	Measuring Range	Accuracy	Overpressure	Code	Unit	Measuring Range	Accuracy	Overpressure	Code
MPa	0 - 3.5	±0.5%FS	7	M3D5	bar	0 - 35	±0.5%FS	70	B035
	0 - 4		10	M4D0		0 - 40		100	B040
	0 - 5		10	M5D0		0 - 50		100	B050
	0 - 6		10	M6D0		0 - 60		100	B060
	0 - 7		10	M7D0		0 - 70		100	B070
	0 - 8		15	M8D0		0 - 80		150	B080
	0 - 9		15	M9D0		0 - 90		150	B090
	0 - 10		15	M010		0 - 100		150	B100
	0 - 16		30	M016		0 - 160		300	B160
	0 - 20		30	M020		0 - 200		300	B200
	0 - 25		37.5	M025		0 - 250		450	B250
	0 - 30		45	M030		0 - 300		525	B300
	0 - 35		52.5	M035		0 - 350		375	B350
	0 - 40		60	M040		0 - 400		600	B400
	0 - 50		75	M050		0 - 500		750	B500
	0 - 60		90	M060		0 - 600		900	B600
	0 - 70		100	M070		0 - 700		1000	B700
	0 - 80		100	M080		0 - 800		1000	B800
0 - 90	100	M090	0 - 900	1000	B900				
0 - 100	110	M100	0 - 1000	1100	B01K				

psi	0 - 500	±0.5%FS	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		

## Absolute Pressure A

Unit	Measuring Range	Accuracy	Overpressure	Code	Unit	Measuring Range	Accuracy	Overpressure	Code	
kPa	0 - 40	±0.5%FS	100	K040	bar	0-1	±0.5%FS	2	B001	
	0 - 50		100	K050		0-1.6		3	B1D6	
	0 - 60		100	K060		0-2		4	B002	
	0 - 70		100	K070		0-2.5		5	B2D5	
	0 - 80		200	K080		0-3		6	B003	
	0 - 90		200	K090		0-4		10	B004	
	0 - 100		200	K100		0-5		10	B005	
	0 - 160	±0.25%FS	300	K160		0-6		10	B006	
	0 - 200		400	K200		0-7		14	B007	
	0 - 250		500	K250		0-8		16	B008	
	0 - 300		600	K300		0-9	18	B009		
	0 - 400		1000	K400		0-10	20	B010		
	0 - 500		1000	K500		0-16	30	B016		
	0 - 600		1000	K600		0-20	40	B020		
	0 - 700		1400	K700		0-25	50	B025		
	0 - 800		1600	K800		0-30	60	B030		
	0 - 900		1800	K900		0-35	60	B035		
MPa	0 - 1	±0.25%FS	2	M1D0	0-40	±0.25%FS	100	B040		
	0 - 1.6		3	M1D6	0-50		100	B050		
	0 - 2		4	M2D0	0-60		100	B060		
	0 - 2.5		5	M2D5	0-70		140	B070		
	0 - 3		6	M3D0	0-80		160	B080		
	0 - 3.5		6	M3D5	0-90		180	B090		
	0 - 4		6	M4D0	0-100		200	B100		
	0 - 5		10	M5D0	0-160		300	B160		
	0 - 6		10	M6D0	0-200		300	B200		
	0 - 7		14	M7D0	0-250		375	B250		
	0 - 8		16	M8D0	0-300	350	B300			
	0 - 9		18	M9D0	0-350	525	B350			
	0 - 10		20	M010	0-400	600	B400			
	0 - 16		30	M016	0-500	750	B500			
	0 - 20		30	M020	0-600	900	B600			
	0 - 25		37.5	M025	0-700	1000	B700			
	0 - 30		45	M030	0-800	1000	B800			
	0 - 35		52.5	M035	0-900	1000	B900			
	0 - 40		60	M040	0-1000	1100	B01K			
	mbar		0 - 400	±0.5%FS	1000	m400	psi	0 - 5	±0.5%FS	10
0 - 500		1000	m500		0 - 10	15		P010		
0 - 600		1200	m600		0 - 15	20		P015		
0 - 700		1400	m700		0 - 30	45		P030		
0 - 800		1600	m800		0 - 60	150		P060		
0 - 900		1800	m900		0 - 100	150		P100		
MPa		0 - 10	±0.25%FS	20	M010	0 - 160		±0.25%FS	300	P160
		0 - 16		30	M016	0 - 200			300	P200
		0 - 20		30	M020	0 - 300			450	P300
		0 - 25		37.5	M025	0 - 400			750	P400
		0 - 30		45	M030	0 - 500			750	P500
		0 - 35		52.5	M035	0 - 600			1500	P600
		0 - 40		60	M040	0 - 700			1500	P700
		0 - 50		75	M050	0 - 800			1500	P800
		0 - 60		90	M060	0 - 900			1500	P900
		0 - 70		100	M070	0 - 1000			1500	P01K
		0 - 80		100	M080	0 - 2000			3000	P02K
		0 - 90		100	M090	0 - 3000			4500	P03K
		0 - 100		110	M100	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	Unit	Measuring Range	Accuracy	Overpressure	Code
kPa	- 25 - 0	±1%FS	50	V025	bar	- 0.25 - 0	±1%FS	0.5	VD25
	- 40 - 0		100	V040		- 0.4 - 0		1	V0D4
	- 60 - 0		100	V060		- 0.6 - 0		1	V0D6
	- 100 - 0		150	V100		- 1 - 0		1.5	V1D0
	- 3 - +3		10	C033		- 0.03 - +0.03		0.1	C0D3
	- 5 - +20		30	C520		- 0.05 - +0.2		0.3	C052
	- 5 - +25		30	C525		- 0.05 - +0.25		0.3	C5D5
	- 15 - +15		30	C015		- 0.15 - +0.15		0.3	CD15
	- 20 - +20		30	C020		- 0.2 - +0.2		0.3	C0D2
	- 25 - +25		50	C025		- 0.25 - +0.25		0.5	CD25
	- 30 - +30	50	C030	- 0.3 - +0.3		0.5	C003		
	- 50 - +50	100	C050	- 0.5 - +0.5		1	C005		
	- 100 - +60	±0.5%FS	150	C16B		- 1 - +0.6	1.5	C0D6	
	- 100 - +100		300	C11B		- 1 - +1	2	C101	
	- 100 - +150		300	C1B5		- 1 - +1.5	3	C1D5	
	- 100 - +300		500	C13B		- 1 - +3	5	C103	
	- 100 - +500		1000	C15B		- 1 - +5	10	C105	
	- 100 - +900		2000	C19B		- 1 - +9	20	C109	
	- 100 - +1000		2500	C11K		- 1 - +10	25	C110	
	- 100 - +1500		3000	C1K5		- 1 - +15	30	C115	
	- 100 - +1600		3000	C1K6		- 1 - +16	30	C116	
	- 100 - +2000		3000	C12K		- 1 - +20	30	C120	
	- 100 - +2400	5000	C24K	- 1 - +24		50	C124		
	- 100 - +2500	5000	C25K	- 1 - +25		50	C125		
- 100 - +3000	6000	C30K	- 1 - +30	60	C130				
- 100 - +3500	7000	C35K	- 1 - +35	70	C135				

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

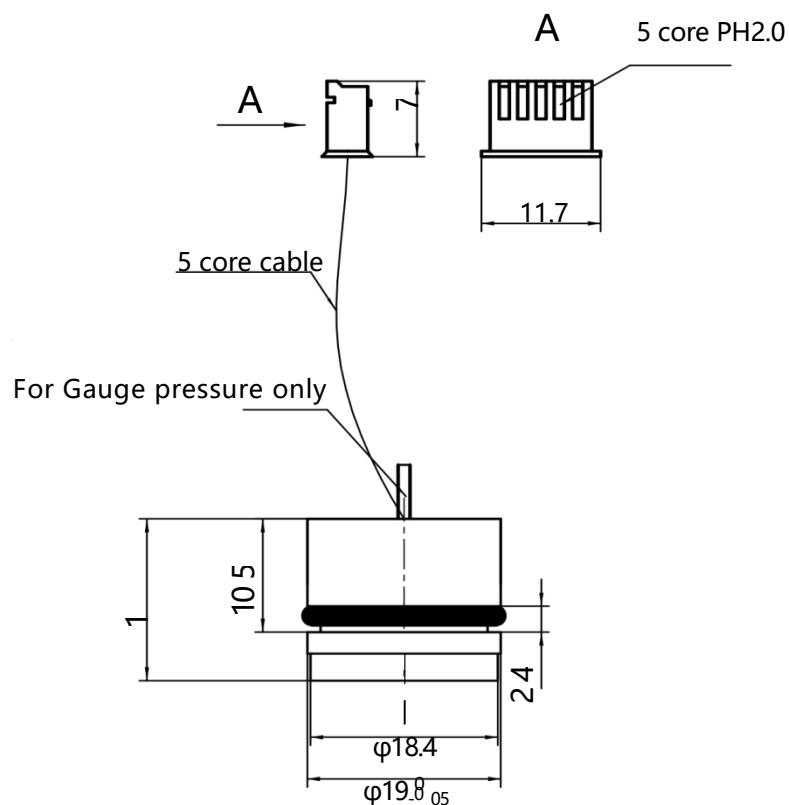
## Output Signals

Output Signal	Power Supply	Output Digits	Output Digital Value	Power Consumption
I <sup>2</sup> C	3.3V±0.1V DC (default)	14-bit (Max. digital value 16383)	1638 (zero, 10%) ~ 14746 (span, 90%)	5μA (standby) 3mA (operating) @25°C
	5V±0.1V DC			
SPI	3.3V±0.1V DC (default)			
	5V±0.1V DC			

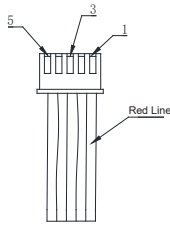
### Note:

The sensor provides a 14-bit pressure output with a max. digital value of 16,383. To allow for overpressure tolerance, the effective output range is set to 10%–90% of max. digital value, corresponding to a zero of 1,638 and a span of 14,746.

## Outline Construction



## Electrical Connection



SN (Red is 1)	Electrical Definition (I <sup>2</sup> C)	Electrical Definition (SPI)
1	V-	V-
2	V+	V+
3	SCL	SCLK
4	SDA	MISO
5	Null	SS

## Order Guide

MPM3801 I <sup>2</sup> C Digital Output Pressure Sensor						
Code	Pressure type					
G	Gauge/Sealed gauge pressure					
S						
A	Absolute pressure					
N	Negative pressure					
Range	-100kPa...0kPa - 10kPa...100MPa					
XXXX	Range-specific code					
Code	Output signal					
C	I <sup>2</sup> C					
D	SPI					
Code	Power supply					
V6	5V±0.1V DC					
V7	3.3V±0.1V DC					
Code	Accuracy					
A1	±0.25%FS					
A2	±0.5%FS					
A3	±1%FS					
Code	Sensor sealing					
00	FKM (standard)					
01	EPDM (optional for special media based on compatibility)					
MPM3801	G	M1D6	C	V7	A1	00

## Notes

- 1、 Please pay attention that the measured medium shall be compatible with the material of wetted parts.
- 2、 The sensor provides a temperature output with a reference accuracy of ±1.5°C (under constant temperature conditions). No temperature output is available for pressure ranges ≥ 7 MPa.
- 3、 For other special requirements, please consult with the MICROSENSOR and specify them in the order.