MPM5581/ MPM5589

Operation Manual

V2.0

MICROSENSOR

Contents

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.

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

MPM5581/ MPM5589 are intelligent switch combining measurement, local display and control together. It uses advanced industrial-grade MCU as core and high quality pressure sensor as sensing element.

MPM5581/ MPM5589 are able to visually process the process pressure(level) and switch contacts status through switch output, analog output and display screen. With special designation and construction, it can be installed vertically, horizontally or rack mounting. The body can rotate 330^{o}; display can rotate 180^{o} in order for viewer to face up to the display screen. OLED display is very clear to read.

MPM5581 can be widely used for industrial site pressure control in pump, hydraulic and pneumatic equipments etc..

MPM5589 can be widely used for level measurement and control for oil tank, fuel tank and lorry; also it can be applied in fields such as water treatment, metallurgy, power plant, water supply and sewage, lab etc.

2 Specifications

Inputs

Range: 0kPa～100kPa…60MPa (pressure)

0m～1m…5m H_2O (level)

Range drift: 25%FS~100%FS

Overpressure: 2×FS or 100MPa (min. value is valid) (pressure,level)

Pressure Type:Gauge,Absolute(pressure,level)

Power supply: 12V~30VDC

Accuracy: ±0.5%FS(pressure)

Hysteresis: ±0.2%FS(pressure,level)

Thermal error: ±0.02%FS/℃ (Zero/FS) (pressure,level)

Long Time Stability: ±0.3%FS/year (pressure)

±0.5%FS/year(level)

Outputs

switch + current output: PNP + 0mA/4mA~20mA DC

Switch current: 1A(Max.) Switch life time: $>1\times10^6$ times

Switch reaction: <10ms Switch time delay: 0s~99s

Switch action pattern: Hys. Mode / Win. Mode

Environment Conditions

Working Temperature: -20℃~80℃

Storage Temperature: -40℃~80℃

Relative Humidity: 0%~85%

EMC: GB/T 17626.2/3/4

Shock:≤10g/10Hz...500Hz(IEC 60068-2-6)

Impact: ≤50g/11ms(IEC 60068-2-27)

Protection: IP65 (housing), IP68 (probe)

Display

Screen display: Blue 128×64 OLED, Peak display.

Switch display: 2 red LED

Display units:

MPa ¦ kPa ¦ bar ¦ psi ¦ kgf/cm^2(pressure)

m ¦ cm ¦ inch(level)

Others

Housing: SS

Display board: PMMA

Key: rubber

Diaphragm: SS 17-4/316L(pressure,level)

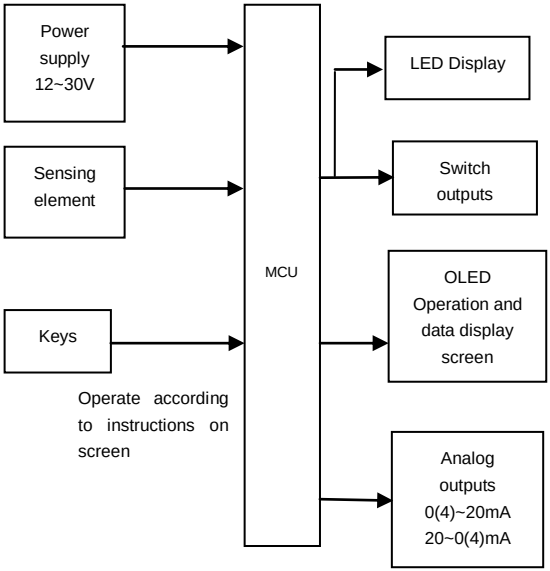
O-ring: Viton Rubber

Electric connection:M12×1 round plug

Gross weight: 300g(pressure)

500g, including 2m breath cable(level)

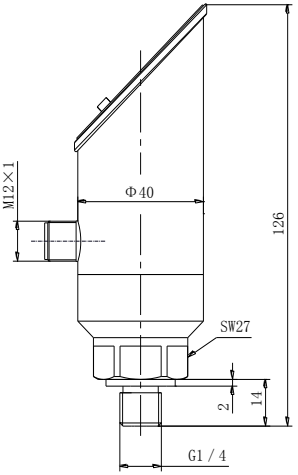
3 Principe



Principle drawing

4 Outline Construction and installation

a) Outline dimension(Unit: mm)



MPM5581 pressure

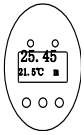
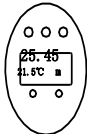
MPM5589 level

b) Installation

Notes before installation: please make sure the measured pressure (or level is within MPM5581 pressure(or MPM5589 level) range; please make sure measured media is compatible with MPM5581/MPM5589 material; please make sure the measured media will not bloke the pressure leading hole of MPM5581/MPM5589.

Forward up display	Reversal display	Forward up display
		
Rack Mounting Installation	Pipe horizontal installation	Pipe vertical installation
		

MPM5581 pressure

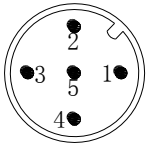
Forward up display	Reversal display
	

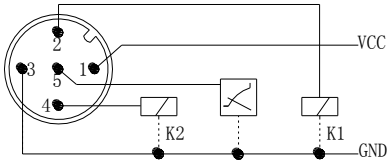
MPM5589 level

5 Electric connection

It is optional to choose M12×1 5-pin plug or 8-pin plug. 8-pin plug is with Modbus communication.

a) 5-pin plug pin definition and wire connection:

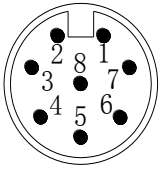


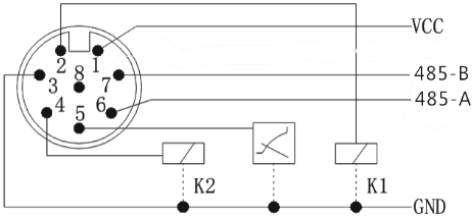


2xPNP current wire connection

Wire	Color	2×PNP+Current
1	Red	VCC
2	Yellow	K1- Output
3	Black	GND
4	Blue	K2-Output
5	Green	0mA/4mA~20mA

b) 8-pin plug pin definition and wire connection:





2×PNP current wire connection

Wire	Color	2×PNP+Current
1	Red	VCC
2	Yellow	K1- Output
3	Black	GND
4	Blue	K2-Output
5	Green	0/4mA~20mA
6	Brown	485-A
7	White	485-B
8	Gray	

6 Parameters setting and usage

It is 3-level menu for keys operation. There will be corresponding instructions for each menu on vice-screen. User please operate according to the instructions.

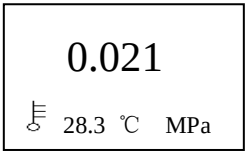
Keys instructions

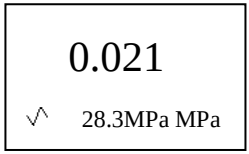
Keys	Functions	Keys	Functions
“Set”	Confirm to enter relative term	“Back”	Back To Previous Menu
“←”	Modification character move 1 bit to the left	“Yes”	Confirm command
“↑”	Cycle from 0~9, Select menu options	“No”	Cancel command
		“Enter”	Enter the current menu

“Next”	Go to the next menu	“↓”	Function item selection

a) Shortcut keys operation

Shortcut keys operation means besides main screen, user can also press shortcut keys to display information on vice-screen. Press "Left" button can display pressure peak value, press "Right" button can display referenced temperature. Please check below pictures for details.

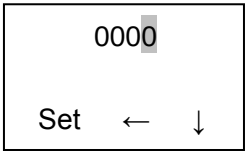


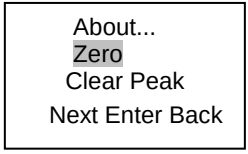


main screen

b) User input password

Press "Middle" button at main screen, then it shifts to password-input interface. There are three options: "Set"," ←","↑". Choose "Set" to finish the setting. For example, if password is 0102, then it enters to 1st level menu. Password interface is as below picture on the left.





c) User parameters setting

If the password is correct, then it enters to user menu as the above

picture on the right. Please refer to keys instructions and menu structure to operate and finish parameters setting.

Notes: after user set all the parameters, please save the settings at "Save Change" menu. Otherwise, the parameters is effective for only once. When the power is off, all the setting parameters will be lost.

Menu structure

1st level main screen	2nd level main screen	3rd level main screen	Options
Zero	Zero Clear?	-	Yes/No
Clear Peak	Clear Peak?	-	Yes/No
Reverse	Dis Reverse?	-	Yes/No
Unit	Pressure	MPa	Mpa、kPa、bar、psi、kgf/cm^2
	Level	cm	cm、m、inch

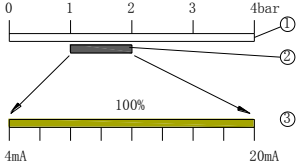
Relay (relay setting)	K1.Func (Switch 1 function)	hys.NO	hys.NO、hys.NC、win.NO、win.NC
	K1.Action (Switch 1 action)	0.500	-
	K1.Release (Switch 1 release)	0.450	-
	K1.Delay (Switch 1 delay)	0.0	0.0~99.9s
	K2.Func (Switch 2 function)	hys.NO	hys.NO、hys.NC、win.NO、win.NC
	K2.Action (Switch 2 action)	0.800	(MPM5881 Pressure default unit: MPa) (MPM5889 Level default unit: m)
	K2.Release (Switch 2 release)	0.750	-
	K2.Delay (Switch 2 delay)	0.0	0.0s~99.9s

Expert function	Drift	Scale.L	0.000
		Scale.H	1.000
	Analog. Set	2K+1A	-
	Density	1000	-
	Base.Point	0.000	-
	Dis.filt	-	-
	Fact.Set	-	-
	Reset.Fact	Reset Fact?	Yes/No
	Addr	002	-
About...	-	-	-
Save Change	-	-	Yes/No

d) Technical terms in the menu:

1) Range Drift:

MPM5581/ MPM5589 is able for range drift between 25%FS and 100%FS. Take 4bar current output as an example, as the below picture, standard range is 0bar~4bar; it outputs 4mA~20mA DC. If range drift to 25%FS ~50%FS, then range is 1bar to 2bar, it outputs 4mA~20mA DC.

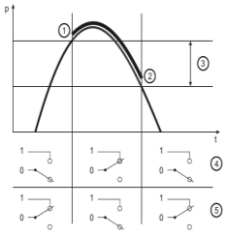
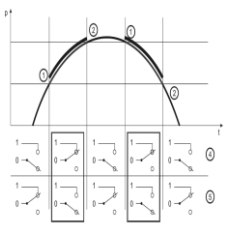


Note: Accuracy will decrease for range drift.

2) Switch property

There are 4 status for MPM5581/ MPM5589 switch output: NO and NC for hys. mode； NO and NC for win. mode as below picture.

Take NO for hys. mode as an example, please refer to ④ on Hys. Mode. When pressure > action value, switch will shift from NO to NC (The action will delay according to the time delay setting. When the time delay is 0s, action is the same as curve under ①and ②. Please set time delay value on the menu). Then it stays at NC status. Until the pressure < release value, switch will back to NO status. Actions for NC hys. mode is opposite to that of NO. For win. mode, when the pressure is within ①and ②, switch action. When it is beyond the range, switch release.

Hys. Mode	Win. Mode
	
①Action Value ②Release Value ③Difference between ①and ② /hysteresis ④ Output status of NO	① Upper action value ② Lower action value ④ Output status of NO ⑤ Output status of NC

⑤ Output status of NC	

7 Attention

a) Before operating the instrument, please read this Manual and electric connection diagram carefully.

b) If you have no standard pressure source, be sure not to adjust the unit; if necessary, please invite the specialist do it.

c) please do not stab the diaphragm with hands or anything sharp to avoid damaging the product.

d) Under the strong interference, please make sure to connect the housing with earth wire well.

8 Responsibility

Within one year from the delivery date, we shall repair or replace the intrument 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 users.

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