

# WP362A monocrystalline silicon absolute pressure transmitter

WP362A type monocrystal silicon absolute pressure transmitter has high quality, high reliability and extensive select range, which can provide kinds of process control system with high-quality and high-additional-value pressure measurement schemes.

## Product introduction

### WP362A monocrystalline silicon absolute pressure transmitter

- Adopt MEMS monocrystal silicon high-precision pressure sensor
- With high response speed and stability
- Measurement accuracy 0.075%FS
- The max. range ratio can reach to 20:1
- Provide standard HART bus communication mode
- Sophisticated self-diagnosis and telecommunication function
- Highlighted LCD with backlight
- Local display screen which can rotate by 360°
- Convenient local zero clearing function
- Convenient local zero point, extreme point setting and calibration function
- Convenient local current loop calibration function

Advanced manufacturing technique

The most reliable quality experience



## Introduction

WP362 type monocrystal silicon pressure transmitter is one of the pressure transmitter series products developed by Fujian Wide Plus Corporation. It has the characteristics of high reliability, long-term stability and easy maintenance.

## With safe, reliable and durable structure

### Process connection

The design of WP362 type can ensure that the circuit board of transmitter can work safely when the sensor diaphragm is broken or has faults. There are two levels of sealing and process isolation on the side (chamber) of electronic circuit. The third-level sealing realizes the isolation between the field connecting terminal and the inlet of wire conduit. The design of process sealing and its position make the shell of transmitter have stronger pressure-proof performance and avoid the process impurities entering from the connecting terminal side by wire conduit.

### The shell of double-chamber structure

WP362 type carries forward the design tradition of WP361 type. It adopts double-chamber shell design, which isolates the electronic circuit from the external environment so as to prevent from damaging the transmitter (due to humid environment or the condensation of wire conduit). It is generally not required to seal the wire conduit. In addition, even when the sensor membrane head is broken completely, the double-chamber structure can also guarantee the isolation of connecting terminal and wire conduit and process.

### Sensor membrane head

The isolation diaphragm will transmit the pressure to MEMS monocrystal silicon sensor and the sensor is filled with silicone oil or inert liquid. With respect to the gage pressure transmitter, the reference pressure of sensor is atmosphere; with respect to the absolute pressure transmitter, the reference pressure of sensor is a sealed vacuum reference source.

The process pressure is added on the sensing diaphragm of sensor and makes the diaphragm have a tiny deformation, which will apply a stress on the Wheatstone bridge in the sensor. Then the Wheatstone bridge will generate corresponding resistance change. The resistance change will be measured and converted into a digital signal, which will be handled by the microprocessor.

### Electronic circuit board module

The electronic board adopts high-performance integrated circuit and surface packaging technology. This board will correct the input signal of sensor and then conduct linear treatment. The output part of electronic board module will convert the digital signal into analog output and conduct communication with the manipulator.

Optional liquid crystal header can display the digital output in the form of pressure, current or analog range value percentage.

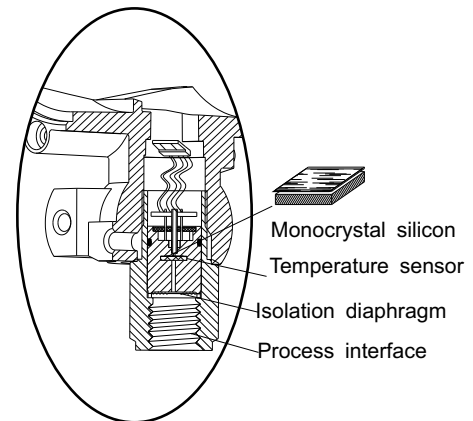


Fig. 1 WP362 type MEMS monocrystal silicon sensor

### Data storage

The configuration data will be stored in the permanent EPROM storage of transmitter electronic board module. After the transmitter is power down, the data will be stored permanently. So after power on, the transmitter can work immediately.

## Functions of WP362 intelligent type software

By using HART communication protocol, the WP362 intelligent type configuration can be tested and set specifically.

### Configuration

By using HART manipulator, users can conveniently conduct current regulation, parameter configuration, HART information, two-point fine tuning and graphical monitoring on WP362 intelligent type. The setting of transmitter's parameter configuration includes:

- Zero and extreme point setting
- Engineering units selection
- Linearity
- Damping time
- Display mode
- Display accuracy

HART information can input the informational data into the transmitter to identify and physically describe the transmitter, including:

- Date
- Station identification: within 8 characters
- Station description: within 16 characters
- Information: within 32 characters

### Test

When the system goes wrong, if the operator confirms that the loop has faults, can let the transmitter provide specific output for loop tests.

# Specification

## Functional parameter

### Applications

Measurement of liquid, gas and steam

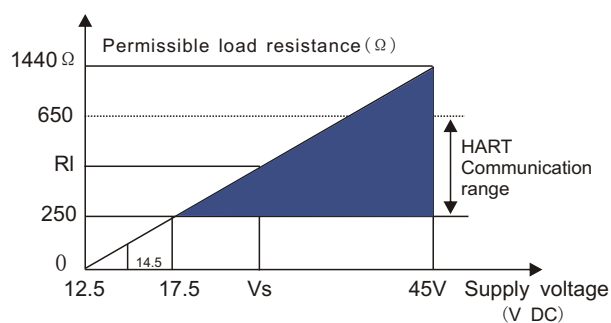
### Range

Range	Min. range	Max. range	Overpressure
1	12.5KPa	250KPa	4MPa
2	0.25MPa	1MPa	6MPa
3	0.5MPa	10MPa	20MPa
4	2MPa	20MPa	40MPa
5	5MPa	40MPa	80MPa
6	16MPa	80MPa	120MPa

### Range ratio

Max. 20:1

### Load limit



Supply voltage - load characteristic relation scheme

Note: The supply voltage range of transmitter with backlight display is 14.5~45V

The supply voltage range of intrinsic-safety series transmitter is 14.5~28V.

The working voltage while HART communication should be larger

### Power supply

Need external power supply. While the transmitter has no load, working voltage is 14.5-36V.

### Positive and negative transference of zero point

The zero point can transfer between the barometric pressure and range upper limit or 0KPa and range upper limit. In addition, the calibration range should be larger than or equal to the min. range and the range upper limit cannot be larger than URL (range upper limit).

### Time response

Time constant: 200ms

Delay time: <0.1s

Refresh rate: 20times/s (min.)

## Temperature limit

### Process

Silicon oil sensor: -40°C to 121°C

Inert liquid sensor: -30°C to 121°C

### Environment

-20°C ~ +70°C

### Storage

-46°C to 110°C

-40°C to 85°C (liquid crystal header)

### Humidity limit

0-100% relative humidity

### Starting time

### Output range

2s, doesn't need preheat.

## Fault mode

### Output code

While discovering the faults of sensor or microprocessor by self diagnosis, the transmitter will output one high or low alarm signal to prompt the users. The alarm output value is subject to the factory configuration mode of transmitter:

Linear output:  $3.8 < I < 20.8$

C4:  $I = 20.8\text{mA}$  high fault

CN:  $I = 3.8\text{mA}$  low fault

## Performance index

(Zero-base range, reference conditions, silicone oil filling liquid, 316 stainless steel isolation diaphragm)

### Accuracy index

0.075%FS (Standard provided option), including the influence of linearity, hysteresis and repeatability

0.1%FS (above 20MPa)

### Damping time

Set the time constant according to the actual condition of field. It is suggested to be 1s.

Temperature drift  
 $\leq 0.075\%FS/10^{\circ}C$

Long-term stability  
 $\leq 0.02\%FS/5$  years

Influence of vibrations  
 Less than 0.075%URL, condition of vibration test: peak-peak value 4mm (5-15Hz)  
 Accelerated speed 2g (15-150Hz) and 1g (150-2000Hz)

Influence of power supply  
 $< 0.01\%$  range/v

Influence of installation position  
 The changing of installation position, which is parallel to the surface of diaphragm, will not cause the effect of null shift. If the change between the installation position and the surface of diaphragm does not exceed  $90^{\circ}$ , the null shift within 0.4KPa can be corrected by zero setting without influencing the range.

Limit of transient voltage protection  
 Electromagnetic compatibility accords with the national standard:

- IEC6100-4-2** Electrostatic discharge immunity test III B
- IEC6100-4-4** Electrical fast transient pulse clusters antinterference test III B
- IEC6100-4-5** Surge (shock) immunity test III B

General index  
 Test according to IEC801-3

## Mechanical performance index

Electrical interface  
 ANSI (American Standard), NPT1/2(F) internal resistance  
 ISO (Chinese standard), M20×1.5 internal thread

Process interface  
 NPT1/2(F)internal thread, NPT1/2(M)external thread, M20×1.5 external thread/inner bore  $\Phi 3$  (standard), M20×1.5 external thread/inner bore  $\Phi 10$  (viscous medium)

## Material of process connecting piece

Isolation diaphragm  
 316 stainless steel, hastelloy C

Process interface  
 316L stainless steel CF-3M

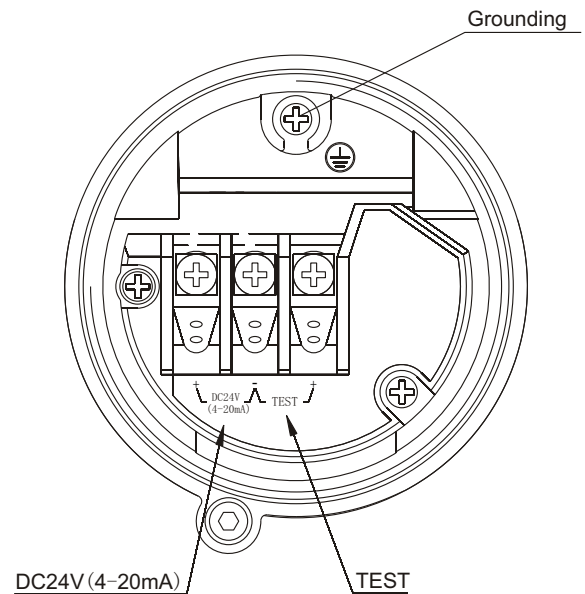
## Non-connecting piece

Shell  
 Aluminium die casting IP65  
 Coating  
 Spraying plastics  
 Meter cap O-ring  
 Nitrile rubber

Filling liquid  
 Silicone oil or inert liquid

Weight  
 About 1.11kg

## Wiring diagram of terminal side



Connecting terminal	
DC24V(4~20mA) <sup>+</sup> <sub>-</sub>	Power supply and output end
TEST <sup>+</sup> <sub>-</sub>	Connect to the testing terminal of ampere meter (impedance should be less than 10Ω)
⏏	Ground terminal

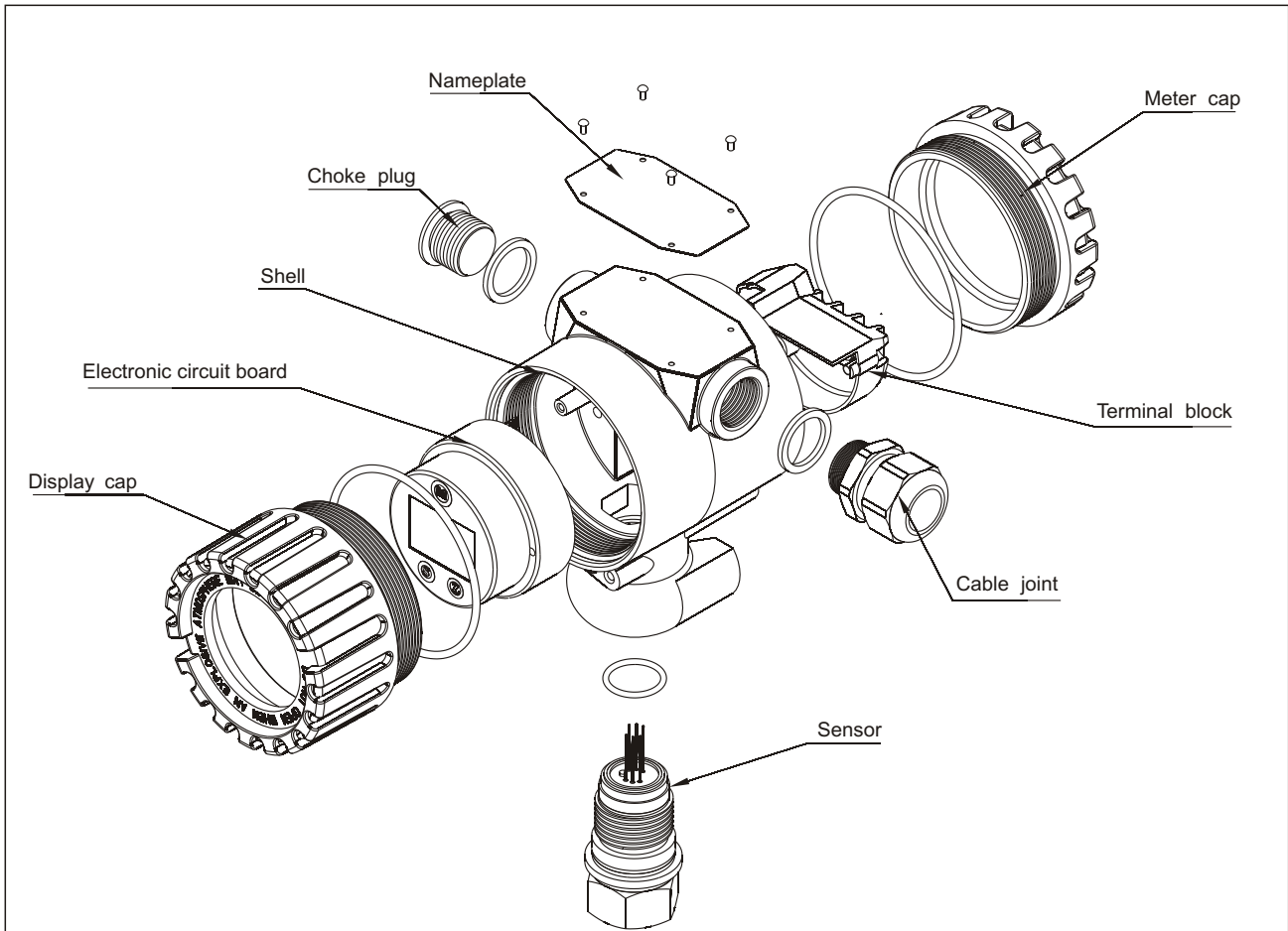


Fig. 2 Parts breakdown drawing of WP362A monocrystalline silicon absolute pressure transmitter

WP362A series monocrystal silicon absolute pressure transmitter

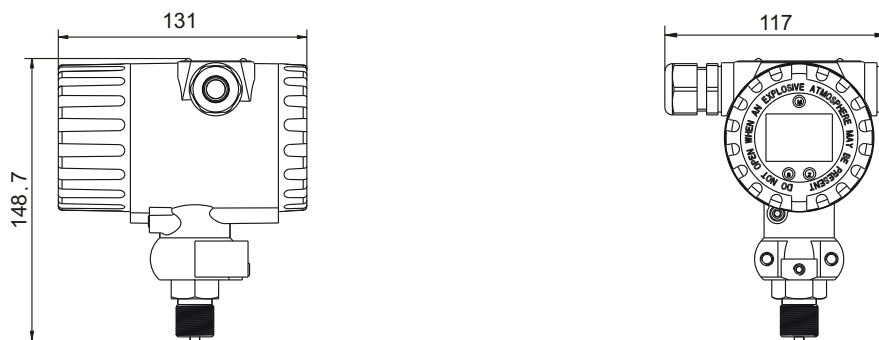
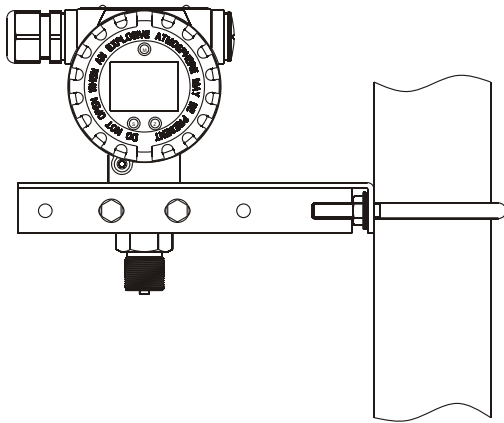
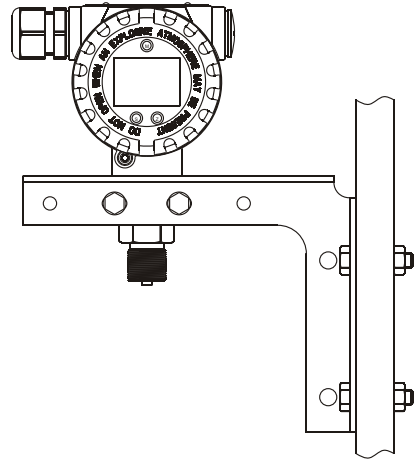


Fig. 3 Dimensional drawing for transmitter



Piping rack installation mode (Code of this option: B4)



Flat bracket installation mode (Code of this option: B5)

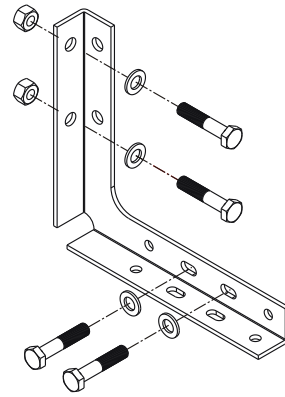
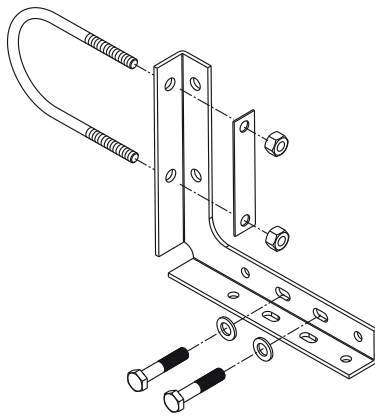
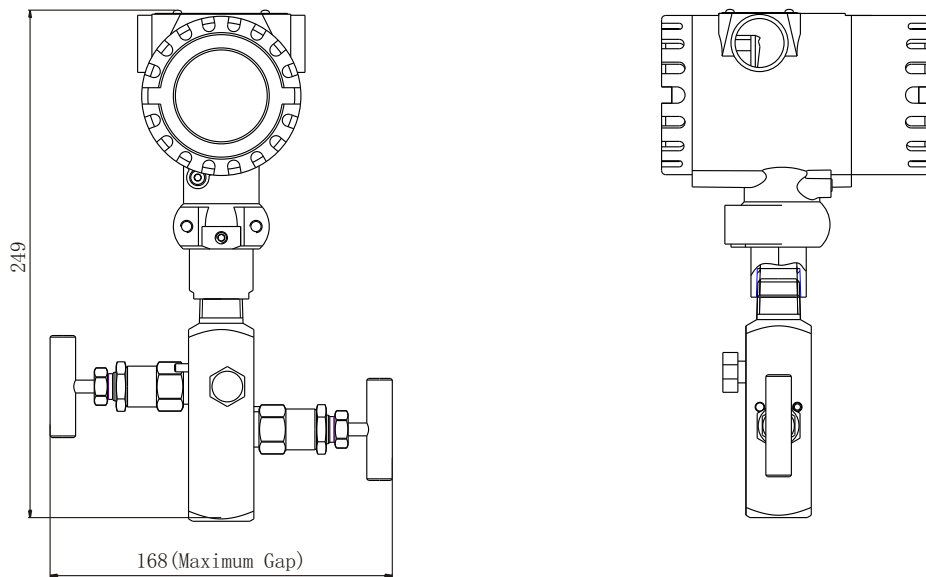


Fig. 4: Installation structure of transmitter, with optional mounting bracket



Component dimension figure of two valve group(unit: mm)

Table 1: WP362A monocrystalline silicon absolute pressure transmitter

Model	Transmitter type	
WP362A-	Monocrystalline silicon absolute pressure transmitter	
Code	Measurement range of pressure	Overload
1	0-12.5~250KPa	4MPa
2	0-0.25~1MPa	6MPa
3	0-0.5~10MPa	20MPa
4	0-2~20MPa	40MPa
5	0-5~40MPa	80MPa
6	0-16~80MPa	120MPa
Code	Filling liquid	Diaphragm material
1	Silicone oil	316L stainless steel
2	Fluorocarbon oil	316L stainless steel
3	Silicone oil	Hastelloy C
4	Fluorocarbon oil	Hastelloy C
5	Silicone oil	Ta diaphragm
6	Fluorocarbon oil	Ta diaphragm
Code	Procedural interface	
F	NPT1/2 internal thread	
M	NPT1/2 external thread	
R	G1/2 external thread	
A	M20×1.5 external thread/inner boreF3 (standard)	
B	M20×1.5 external thread/inner boreF10 (viscous medium)	
P1	Clamp-on design (1.5 inches) F50.5mm	
P2	Clamp-on design (2 inches) F64mm	
Y	Special requirements	
Code	Electrical interface	
A	NPT1/2 internal thread	
M	M20×1.5 internal thread	
Code	Header	
-M	LCD display	
-N	No header	
Code	Options for the hazardous occasion certification	
N	Ordinary type (no anti-explosion)	
D	Flame-proof Exd II CT6	
I	Intrinsic-safety type Exia II CT6	
Code	Mounting bracket	
N	No bracket	
B4	Pipe bracket (2"pipe)	
B5	Tablet bracket	
Code	Integrated valve assembly option(optional)	
V2	Two valves manifold	
Code	Other option	
H	The measurement accuracy is 0.075%FS	
S	The liquid material is 316 stainless steel	
R	With heat sink	
Q4	Verification certificate(Contact Wide Plus)	
C4	High alarm	
CN	Low alarm (The default setting is low alarm)	
Y	Special requirements	
Example	WP362A-11FA-MDB4	

Note: 1,"Valve group integrated installation option" can be selected or not, the standard is provided for 316 material, if you have other requirements can contact our company

2,The default contact liquid material is 304 stainless steel