Product introduction

Description

PB400 monosilicon pressure transmitter is a high performance pressure transmitter with international leading technology meticulously designed by FTInstrument, using the world's most advanced monosilicon pressure sensor technology and patent encapsulation technology.
Monosilicon pressure sensor locates on the top of the metal body and stay away from the medium interface to realizes mechanical isolation and thermal isolation. Glass sintering sensor wire realizes high strength electrical insulation of metal base and improves the capability of flexibility of electronic circuit and transient voltage resistance protection. All these original encapsulation technologies enable PB400 to easily cope with extreme chemical occasion and mechanical load, and own strong resistance to EMI, sufficient to respond to the most rigorous industrial environment applications, which are the genuine invisible instruments.

Main parameters

Pressure types	Differential pressure
Measuring range	200Pa - 10MPa, Please refer to the ordering information chapter
Output signal	4-20mA、4-20mA+HART, customer
Reference accuracy	±0.075%... ±0.5%URL, optional ±0.05% URL

Measuring medium

Liquid, gas, or steam flow as well as liquid level, density and pressure

Field of application

Pressure, level, differential pressure, density, interface, flow

Approvals

CE

Technical specifications

Measuring range and limit

Nominal value	Smallest calibratable span	Lower range limit (LRL)	Upper range limit (URL)	Static pressure limit	High pressure side overload limit	Low pressure side overload limit
6kPa	200Pa	-6kPa	6kPa	25MPa	25MPa	16MPa
40kPa	400Pa	-40kPa	40kPa	40MPa	25MPa	16MPa
250kPa	2.5kPa	-250kPa	250kPa	40MPa	25MPa	16MPa
1MPa	10kPa	-500kPa	1MPa	40MPa	25MPa	16MPa
3MPa	30kPa	-500kPa	3MPa	40MPa	25MPa	16MPa
10MPa	100kPa	-500kPa	10MPa	40MPa	25MPa	16MPa
Adjust requirements: lower range value (LRV) and upper range value (URV) can be adjusted within the scope of the upper and lower range limit, when | URV | ≥ | LRV | , needs | URV | ≥ smallest calibratable span when | URV | ≤ | LRV |, needs | LRV | ≥ smallest calibratable span						

Standard specifications and reference conditions

Test standard: GB/T28474 / IEC60770; zero based-calibration span, linear output, silicone oil filling, 316L stainless steel isolation diaphragm.

Performance specifications

The overall performance including but not limited to 【Reference accuracy】, 【Environment temperature effects】, 【Static pressure effects】and other comprehensive error

Typical accuracy: ±0.075% ...±0.5% URL

Stability: ±0.2% URL/5 years

Reference accuracy

Including linearity, hysteresis and repeatability.
calibration temperature: 20℃ ± 5℃

Linear output accuracy	TD ≤10 (note 1)	±0.075% URL	Nominal value 6kPa、40kPa
	Max.	±0.5% URL	250kPa、1MPa 3MPa、10MPa

Square root output accuracy is 1.5 times linear output accuracy

Note 1: TD is Turn down,
when \| URV \| ≥ \| LRV \| , TD=URL/ \| URV \|
when \| URV \| ≤ \| LRV \| , TD=URL/ \| LRV \|

Ambient temperature effects

Within the range -20-80℃ total impact	±(0.1+0.1TD)% URL

Static pressure effects

Effect on zero	±0.15TD % URL/10MPa
Effect on full scale	±0.2% URL/10MPa

Power supply effects

When power supply voltage is within 10.5/16.5-55VDC, zero and span change should not more than ±0.005% URL/V

Mounting position effects

Install error less than 400Pa, which can be corrected by PV=0 reset.

Vibration effects

According to IEC61298-3,<0.1% URL

Output signal

Two wire 4-20 mA output with digital communications, linear or square root output programmable, HART protocol is superimposed on the 4-20mA signal.

Technical specifications

Damping time

Total damping time constant: equal to the sum of damping time of amplifer and sensor capsule
Damping time of amplifer : 0-100S adjustable
Damping time of sensor capsule (isolation sensor diaphragm and silicon filling oil)≤0.2S
Startup after power off: ≤6S
Normal services after data recovery : ≤31S

Weight

Net weight: about 4 kg (without mounting bracket and process connection adaptor)

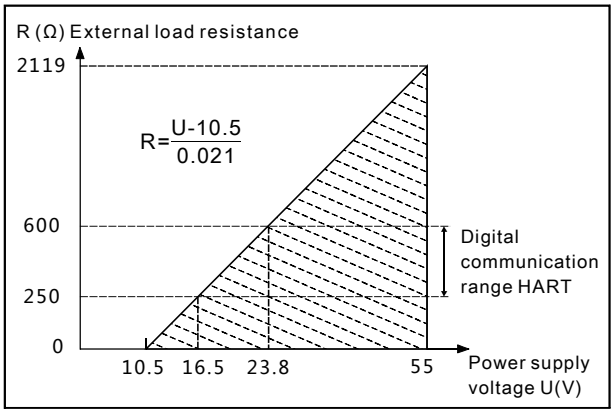
Environment condition

Items	Operational condition
Working temperature	-40-85℃, integrated LCD display : -20-70℃
Storage temperature	-40-110℃, integrated LCD display : -40-85℃
Media temperature	Silicone oil filling:-40-120℃
	Inert oil filling:-10-80℃
Working humidity	5-100%RH@40℃
Protection class	IP67
Dangerous condition	II 1G/2G Ex ia IIC T4 Ga II 2G Ex db IIC T6 Gb(PB430)
＊Please consult engineers for details	

Power supply

Item	Operating conditions
Standard/flame proof	10.5-55VDC
HART protocol	16.5-55VDC,communication load resistance 250Ω
Load resistance	0-2119Ω for operation, 250-600Ω for HART protocol
Transmission distance	<1000 meters
Power consumption	≤500mW@24VDC,20.8mA

Power supply and load requirements



EMC environment

NO.	Test items	Basic standards	Test conditions	Performance level
1	Radiated interference	CISPR22	30MHz-1000MHz	OK
2	Conducted interference (DC power port)	CISPR22	0.15MHz-30MHz	OK
3	Electrostatic discharge immunity test (ESD)	IEC61000-4-2	4kV(Contact),8kV(Air)	B(Note2)
4	Immunity to radio frequency EM-fields	IEC61000-4-3	10V/m(80MHz-1GHz)	A(Note1)
5	Power frequency magnetic field Immunity test	IEC61000-4-8	30A/m	A(Note1)
6	Electrical fast transient / Burst Immunity Test	IEC61000-4-4	2kV(5/50ns,100kHz)	B(Note2)
7	Surge immunity requirements	IEC61000-4-5	1kV(Line to line) 2kV(Line to ground) (1.2us/50us)	B(Note2)
8	Immunity to conducted disturbances induced by radio frequency fields	IEC61000-4-6	3V(150kHz-80MHz)	A(Note1)

(Note 1)Performance level A: The performance within the limits of normal technical specifications.
(Note 2)Performance level B: Temporary reduction or loss of functionality or performance, it can restore itself. The actual operating conditions, storage and data will not be changed.

Menu function

Specific menu

Transmission module type

Output signal	Local control	Remote control
4-20mA+HART	LCD/3 buttons on body	HART
4-20mA	LCD/3 buttons on body	-

LCD display unit

Display mode	Details
PV	Process variable shows on main screen, percentage and progress bar shows on secondary screen
mA	Current shows on main screen, percentage and progress bar shows on secondary screen
%	Percentage shows on main screen, percentage and progress bar shows on secondary screen

Unit

Unit	Definition
kPa	Kilopascal
MPa	Megapascals
bar	Bar
psi	Pounds per square inch
mmHg	Millimetre(s) of mercury@0℃
mmH2O	Millimeter of water@4℃
mH2O	Meter of water@4℃
inH2O	Inches of water@4℃
ftH2O	Feet of water@4℃
inHg	Inches of mercury@0℃
mHg	Meter mercury column@0℃
TORR	Torr
mbar	Millibar
g/cm2	Gram per square centimeter
kg/cm2	Kilogram per square centimeter
Pa	PA
ATM	Standard atmospheric pressure
mm	Millimeter(Note1)
m	Meter(Note1)
Note1: length unit need mark medium density	

Measuring menu set

Mark	State
URV	Upper range value, 20mA
LRV	Lower range value, 4mA

Damping time

Units	Setting range
S	0-100

Analog output type

Parameters	Output type
mA LINER	Linearity
mA $\sqrt{}$	Square root

Alarm signal

Parameters	Alarm signal
ALARM NO	None
ALARM H	20.8mA
ALARM L	3.8mA

Fix output

Parameters	Fix output value
FIX/C NO	None
3.8000	3.8000mA
4.0000	4.0000mA
8.0000	8.0000mA
12.000	12.000mA
16.000	16.000mA
20.000	20.000mA
20.800	20.800mA

Quick menu

Parameter	Instruction
PV=0	Set current output to zero value, used to correct the error cased by static pressure and installation.
Zero adjustment	4mA re-range with pressure
Span adjustment	20mA re-range with pressure
Restore factory setting	Restore backup data when error

Product selection instruction

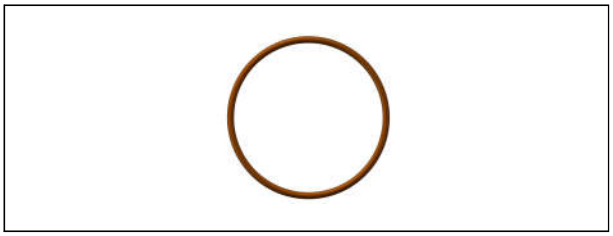
Sensor select instruction

Code	Nominal value	Description
1	6kPa	Range -6-6kPa, smallest calibratable span 200Pa
2	40kPa	Range -40-40kPa, smallest calibratable span 400Pa
3	250kPa	Range -250-250kPa, smallest calibratable span 2.5kPa
4	1MPa	Range -0.1-1MPa, smallest calibratable span 10kPa
5	3MPa	Range -0.5-3MPa, smallest calibratable span 30kPa
6	10MPa	Range -0.5-10MPa, smallest calibratable span 100kPa

Code	Position	Instruction
1	Diaphragm material	SS 316L
2		Hastelloy C
3	Fluid filling	Sillicon oil, temperature limit: -45-205℃
4		Inert oil, temperature limit: -45-160℃
5	Sensor seal	O-ring, FKM, temperature limit:-20-200℃

Diaphragm

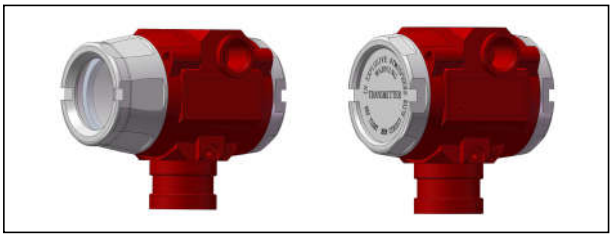
Seal



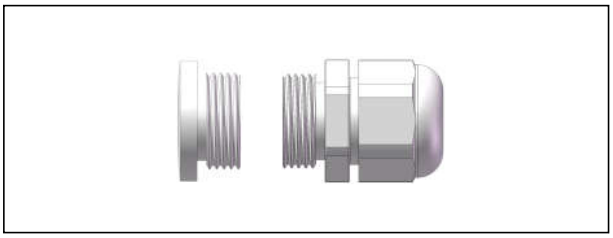
Electrical connection select instruction

Code	Item	Description
1	Electrical connection	Aluminum-alloy terminal,2 cable entry M20*1.5(F), red body, white cover
2	Cable entry protector	Waterproof connector M20X1.5 one side , blind plug another side, PVC material,6-8mm diameter cable only, IP67
3		Flame proof, 1/2 NPT(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67
4		Flame proof, M20X1.5(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67

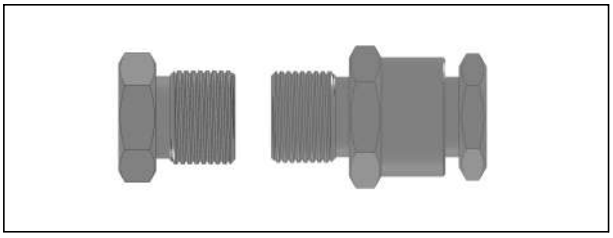
Housing



Standard cable entry protective adaptor



Flame proof cable entry protective adaptor



Product selection instruction

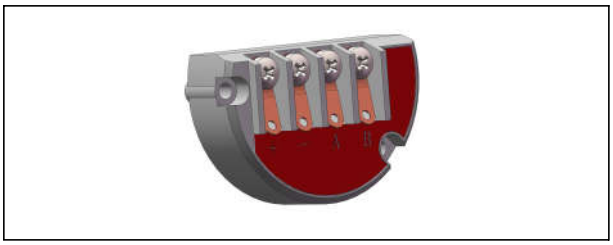
Transmission module

Code	Items	Description
1	Output signal	4-20mA two wire, power supply: 10.5-55VDC
2		4-20mA+HART two wire, power supply:16.5-55VDC
3	Display	Without display
4		With LCD display

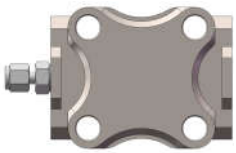
Process connection selection

Code	Item	Description
1	Flange/ Drain Valve	H structure, double flanges, process connection 1/4-18NPT(F) ,drain valve on the rear end of flange, material SS 316
2		H structure, double flanges, process connection 1/4-18NPT(F), drain valve on the up part of flange, material SS 316
3		H structure, double flanges, process connection 1/4-18NPT(F),drain valve on the down part of flange, material SS 316

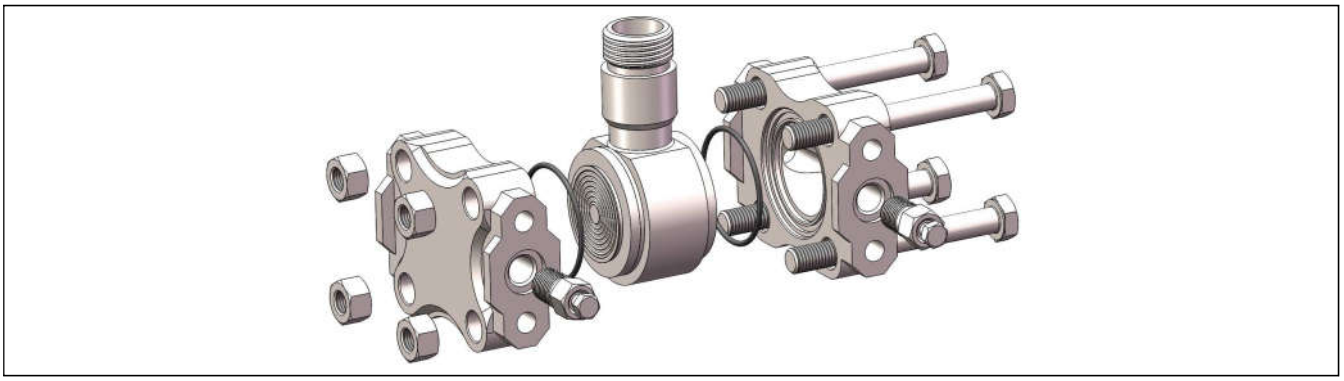
Terminals



Flange

1	
2	
3	

Wetted parts

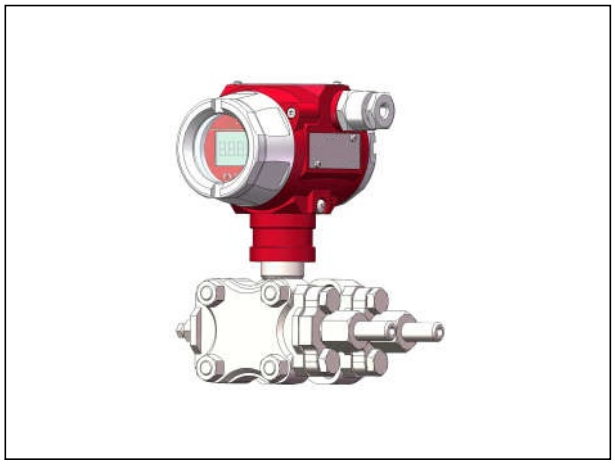


Product selection instruction

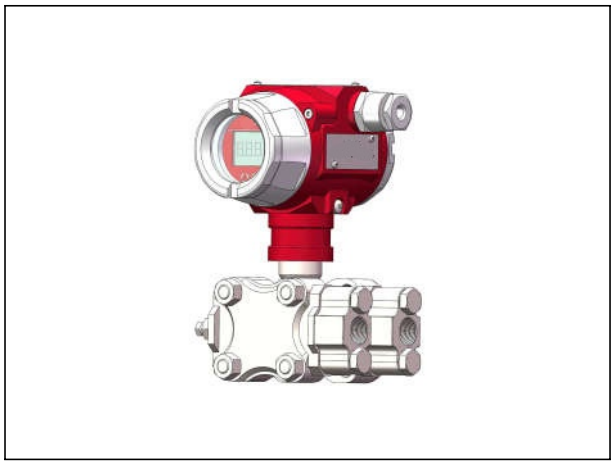
Process connection adaptor

Code	Item	Description
1	Process connection adaptor	Adaptor, M20*1.5 (M) with pressure-guided pipe Φ14*2*30,SS304, apply to H-structure
2		Adaptor, 1/2-14NPT(F), SS 304, apply to H-structure

Adaptor, M20*1.5 (M) with pressure-guided pipe



Adaptor, 1/2-14NPT



Brackets

Code	Items	Details
1	Fixed mounting	Pipe mounting bent bracket,2" pipe, carbon steel, apply to H-structure
2		Plate mounting bent bracket, carbon steel, apply to H-structure
3		Pipe mounting flat bracket,2" pipe, carbon steel, apply to H-structure

Pipe mounting bent bracket

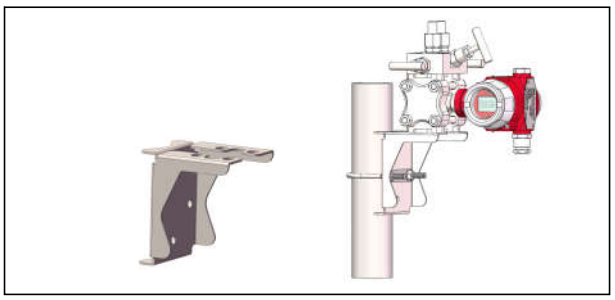
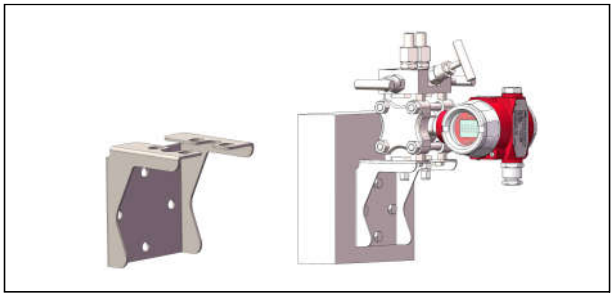
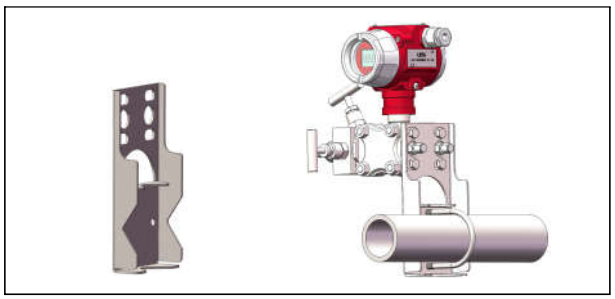


Plate mounting bent bracket(2)

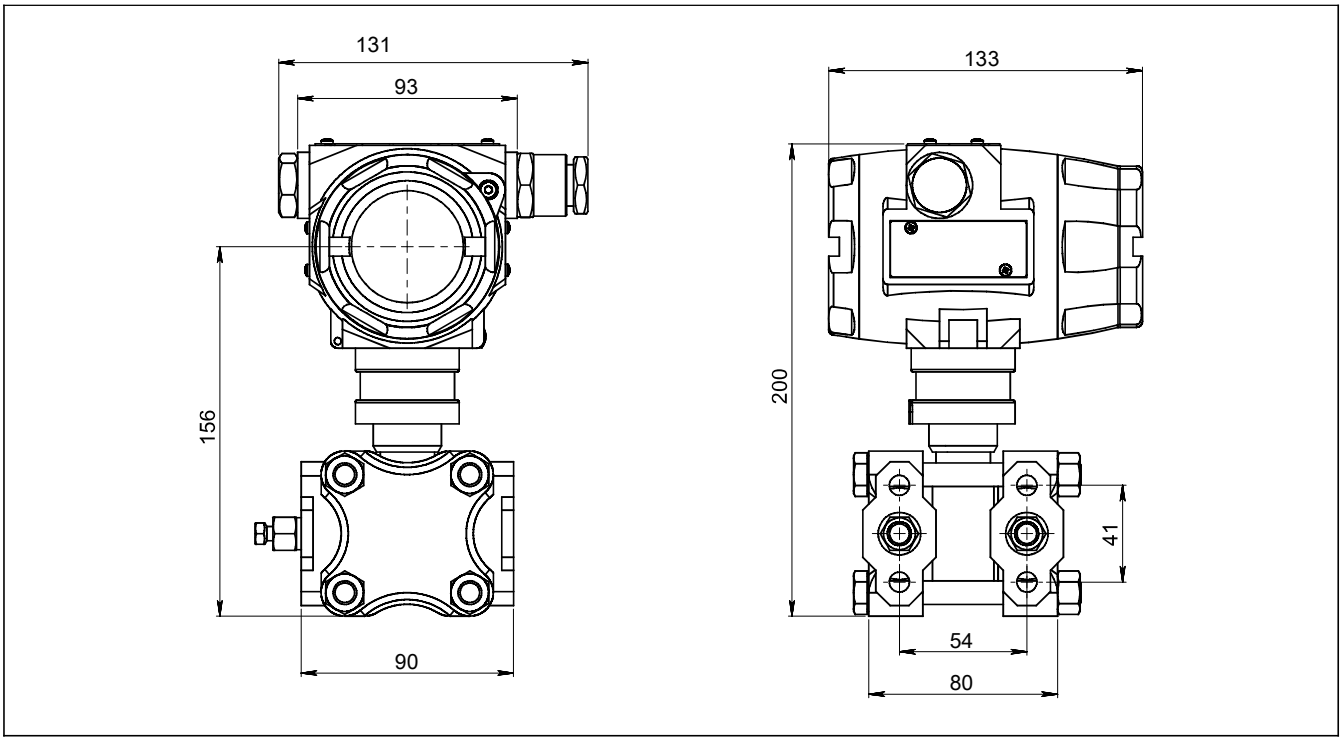


Pipe mounting flat bracket(3)

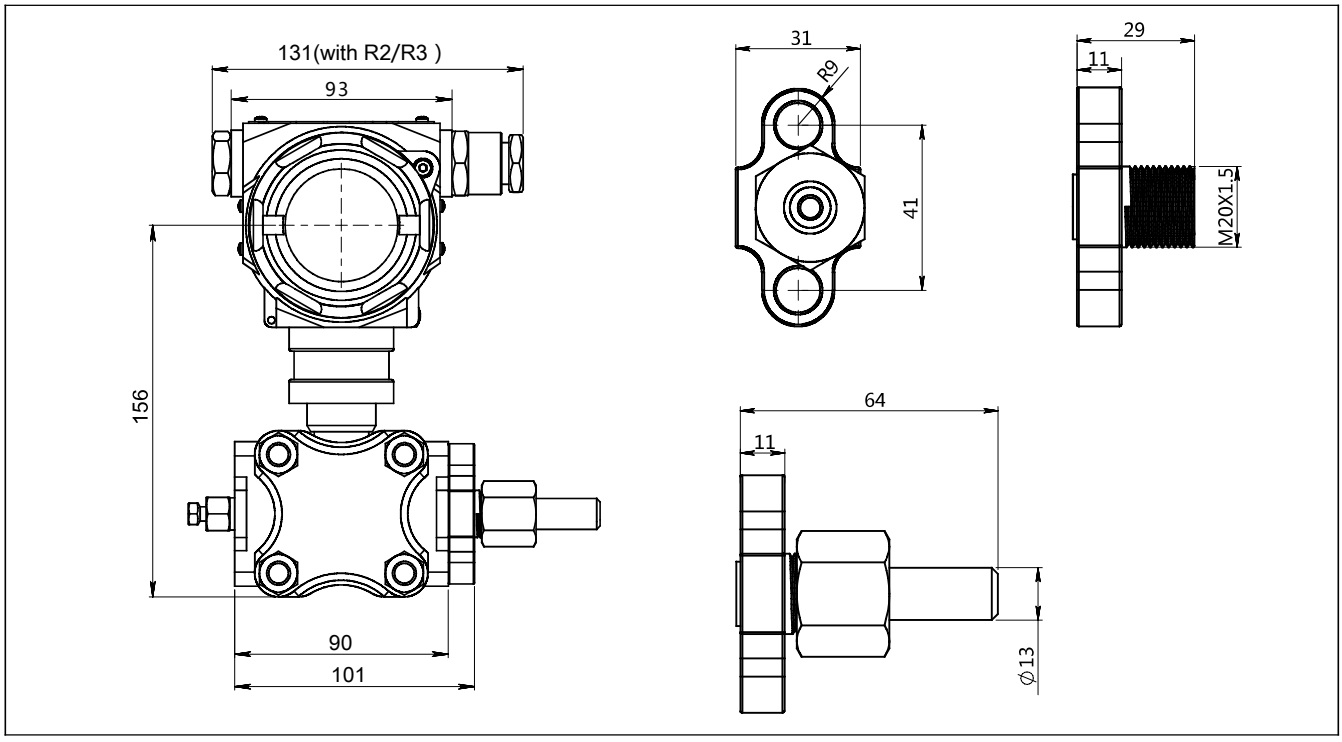


Product drawing and dimension

Drawing and dimension with display(C)(unit:mm)



Product drawing and dimension



Installation drawing and dimension

Pipe mounting bent bracket drawing and dimension (unit:mm)

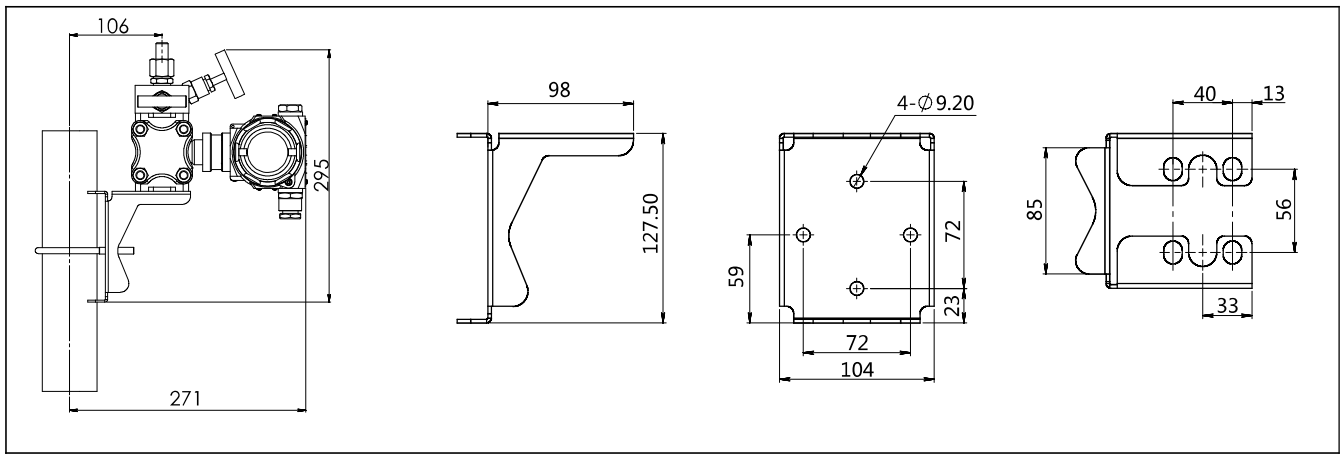
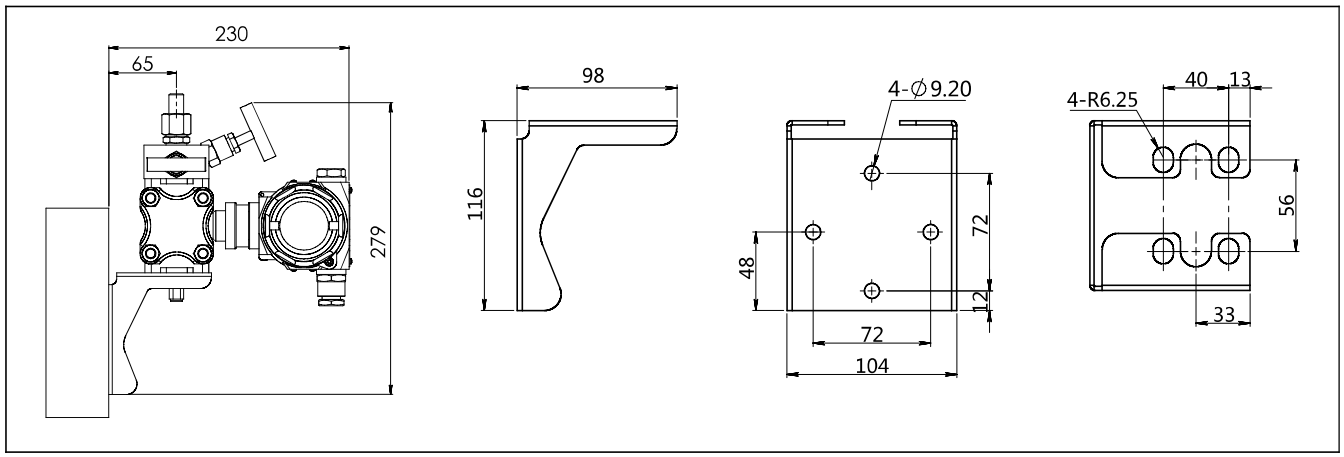
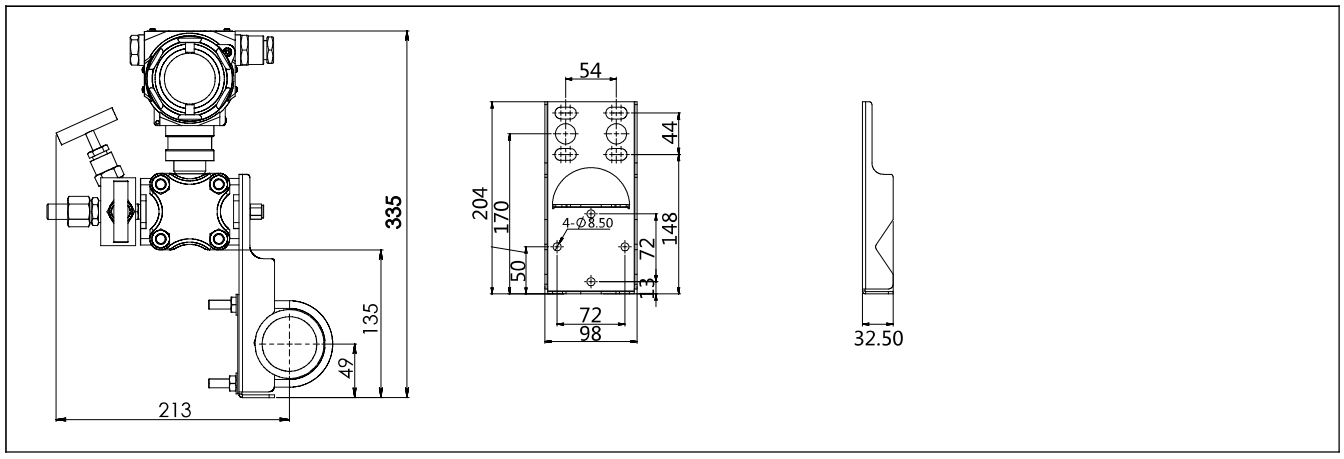


Plate mounting bent bracket(2)drawing and dimension (unit:mm)



Pipe mounting flat bracket (3)drawing and dimension (unit:mm)



Telephone: +1 302 300 1919 • Fax: +1 302 300 1619
mail:sales@ftisensors.com FTI .Inc
1013 Centre Road, Suite 403S Wilmington, DE 19805
www.ftisensors.com