

Monocrystalline silicon pressure transmitter

Model PY681G

Description



PY 681G gauge pressure transmitter adopts monocrystalline silicon pressure sensor, which is located on the top of the metal body, far away from the medium contact surface to realize mechanical isolation and thermal isolation. It is located on the top of the metal body, far away from the medium contact surface to realize mechanical and thermal isolation, and the high strength electrical insulation of the glass sintered sensor leads and the metal substrate improves the flexibility of the electronic circuits and the ability to withstand transient voltage protection. It can cope with complex chemical situations and mechanical loads, meanwhile, it has strong anti-electromagnetic interference ability, suitable for harsh process industry environment of pressure, liquid level or flow rate.

The high strength electrical insulation increases the flexibility of the electronics and the ability to withstand transient voltage protection, allowing them to cope with complex chemical and mechanical loads.

Main parameters

Pressure type	Gauge pressure
Range	2mbar-800bar, see selection table for details
Output Signal	4-20mA/4-20mA+HART/Modbus-RTU/RS485 and others
accuracy	$\pm 0.075\%$ upper range limit, optional $\pm 0.05\%$ upper range limit, see specifications.

Applications

Pressure, Level, Differential Pressure, Density, Interface, Flow

Measuring medium

Fluids compatible with contact materials

Features

Code	Features
1	Adopt monocrystalline silicon high precision pressure sensor
2	Accuracy 0.075%FS, maximum 0.05%FS
3	Range ratio up to 100:1
4	Strong overload capacity, unidirectional pressure up to 200bar
5	Maximum static pressure up to 100 bar
6	Provide standard HART bus communication mode
7	High brightness liquid crystal display with backlighting
8	360° rotatable local display screen
9	Convenient local zero function

Specifications

Scale and Range Limits

Nominal Range	Minimum Range	Lower Range(LRL)	Upper Range(URL)	Overload
R006K2	2mbar	0bar	60mbar	5bar
R040K3	40mbar	-1bar	400mbar	5bar
R250K4	125mbar	-1bar	2.5bar	10bar
R001M5	1bar	-1bar	10bar	20bar
R003M6	3bar	-1bar	30bar	60bar
R010M7	10bar	-1bar	100bar	200bar
R040M8	40bar	-1bar	400bar	800bar
R080M9	80bar	-1bar	800bar	120bar

If $URV \geq LRV$, $URV \geq$ minimum range; If $URV \leq LRV$, $LRV >$ minimum range.

Overpressure limit value: depends on the weakest part of the pressure-bearing capacity, the overload pressure is the maximum pressure that the sensor can withstand, not the maximum pressure that the product itself can withstand.

Performance Test Standards and Reference Conditions

Zero full scale, reference conditions, silicone oil filled, 316 stainless steel isolation diaphragm, 4-20mA analog output, digital trim value equal to range set point value.

Performance indicators

- Overall performance includes reference accuracy, combined error of ambient temperature effects, hydrostatic pressure effects and other effects.
- Typical Accuracy: $\pm 0.075\%$ of upper range limit
- Annual Stability: $\pm 0.2\%$ upper range limit/5 years

Reference accuracy

Linearity, hysteresis, and repeatability from zero point according to standard and test reference conditions. Calibration Temperature: $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$			
accuracy	$TD \leq 10(1)$	$\pm 0.075\% \text{ F.S}$	250kPa, 1MPa, 3MPa, 10MPa
	$10 < TD \leq 100$	$\pm \left[0.025 + 0.05 \frac{X}{\text{SPAN}} \right] \%$	
Square root output accuracy is reference accuracy * 1.5			
1: TD is ranges, $TD = \text{URL} / \text{URV} - \text{LRV} $			

X value

Nominal range	X value
R006K2	6mbar
R040K3	40mbar
R250K4	250mbar
R001M5	1bar
R003M6	3bar
R010M7	10bar
R040M8	40bar
R080M9	80bar

Ambient Temperature Effect

Total Impact over the range of -20 to 80°C
 $\pm(0.1+0.1\text{TD})\%$ upper range limit

Static pressure effect

$\pm 0.15\%/10\text{MPa}$ upper range limit

Power supply effect

$\pm 0.005\%$ upper range limit/V

Installation position effect

2mbar

The change of mounting position parallel to the diaphragm surface will not affect the zero drift, but if the mounting position changes more than 90° from the diaphragm surface, the zero drift within 0.4KPa can be corrected by adjusting the zero position, and the measuring range will not be affected.

Effect of zero point

The zero position can be corrected locally according to the installation position on site, etc., or the pressure zero position can be relocated.

Vibration effect

Tested according to IEC61298-3, $< 0.1\%$ upper limit of range

Output signal

Signal	Type	Output
4-20mA	Linear	2-wire
4-20mA+HART	Linear	2-wire
Mobus-RTU/RS485	Linear	4-wire

Specifications

Damp time

- Total damping time constant: equal to the sum of the damping time constant of the electronic circuit parts and the sensing membrane box, recommended: 1kPa 2s / 6kPa 1s.
- Damping time: Adjustable from 0-100S.
- Sensing diaphragm box (isolation sensing diaphragm and silicone oil filling liquid) damping time: <0.2S
- Start-up time after power failure: <0.2S
- Data recovery time to normal use: <31S

Weight

about 4kg(without mounting bracket, process connection accessories)

Environmental conditions

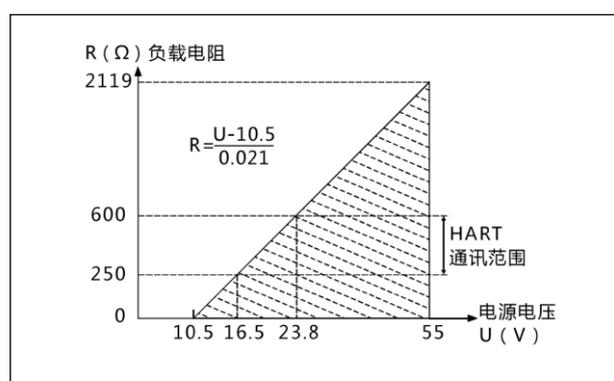
- Ambient temperature range: -40-85°C, integrated LCD display: -20-70°C
- Humidity limit range: -40-110°C, integrated without display: -40-85°C
- Process temperature limit range:
 - Silicone oil filled sensor: -40-121°C
 - Fluorine-filled sensor: -30-121°C
- Storage ambient temperature range: 0-100% relative humidity
- Protection class: Ip67
- Hazardous area: ExdIICT6,ExialICT6

*Consult an engineer for details

Power supply

- Standard/flameproof: 10.5-55VDC
- HART communication protocol: 12-55VDC, 250Ω load resistance during communication.
- RS 485: 12-32VDC
- Load resistance: 0-2119Ω for working condition, 250-600Ω.
- Transmission distance: HART communication <1000 meters
- Power consumption: ≤500mW@24VDC, 20.8mA

Power and load conditions



Electromagnetic Compatibility

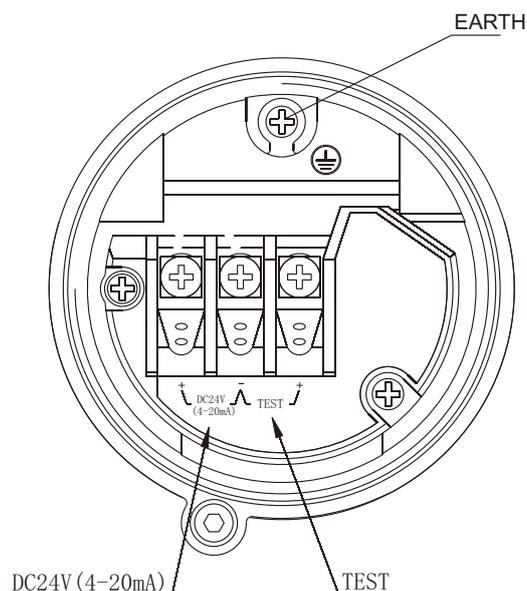
Code	Test Item	Standard	Test Condition	Performance Class
1	Electrostatic Discharge Immunity	IEC 61000-4-2	6kV(Contact), 8kV(Air)	B
2	Radio-frequency Field	IEC 61000-4-3	10V/m;80MHz ~ 6GHz; 80%AM(1kHz)	A
3	Power Frequency Magnetic Field	IEC 61000-4-8	Stable sustained magnetic field strength 50Hz,60Hz,100A/m	A
4	Immunity of Electrical Fast Pulse Group	IEC 61000-4-4	±2kV; 5/50 Tr/Tk ns, 5kHz	A
5	Surge Immunity	IEC 61000-4-5	±2kV; 1.2/50(8/20) Tr/Th us	B
6	RF Induction Conduction Anti-harassment	IEC 61000-4-6	10V(150kHz ~ 80MHz); 80%AM(1kHz)	A

Note: Performance level A, normal performance within the limits of the technical specifications; Performance level B, temporary reduction or loss of functionality or performance, but self-recovering, with no change in the actual operating conditions, storage and its data.

Specifications

Basic information	
Transmission Module Type	4-20mA+HART,LCD/case three keys 4-20mA,LCD/case three keys
Display screen	<ul style="list-style-type: none"> ■ PV: Main screen displays the process variable and the secondary screen displays the percentage and progress bar ■ mA: Main screen shows current value, secondary screen shows percentage and progress bar ■ %: Main screen displays percentage, secondary screen displays percentage and progress bar
Measurement range setting	Upper limit, 20mA output Lower limit, 4mA output
Process Unit	kPa,bar,psi,mmHg,mmH2O,mH2O,in2O,inHg,mHg,Torr,mbar,g/cm2,kg/cm2,Pa,atm,mm,m Note 1: length unit, need to indicate the density of the medium1 ... 100 bar
Damp	0~100s
Output Signal Type	Linear Output or Square Output
Alarm Mode	<ul style="list-style-type: none"> ■ No Alarm ■ High Alarm ■ Low Alarm
Test Current	3.8,4,8,12,16,20,20.8mA
Display	Multifunctional LCD, 5 1/2 digit, with background lighting

Terminal Wiring Diagram



Product 3D drawing

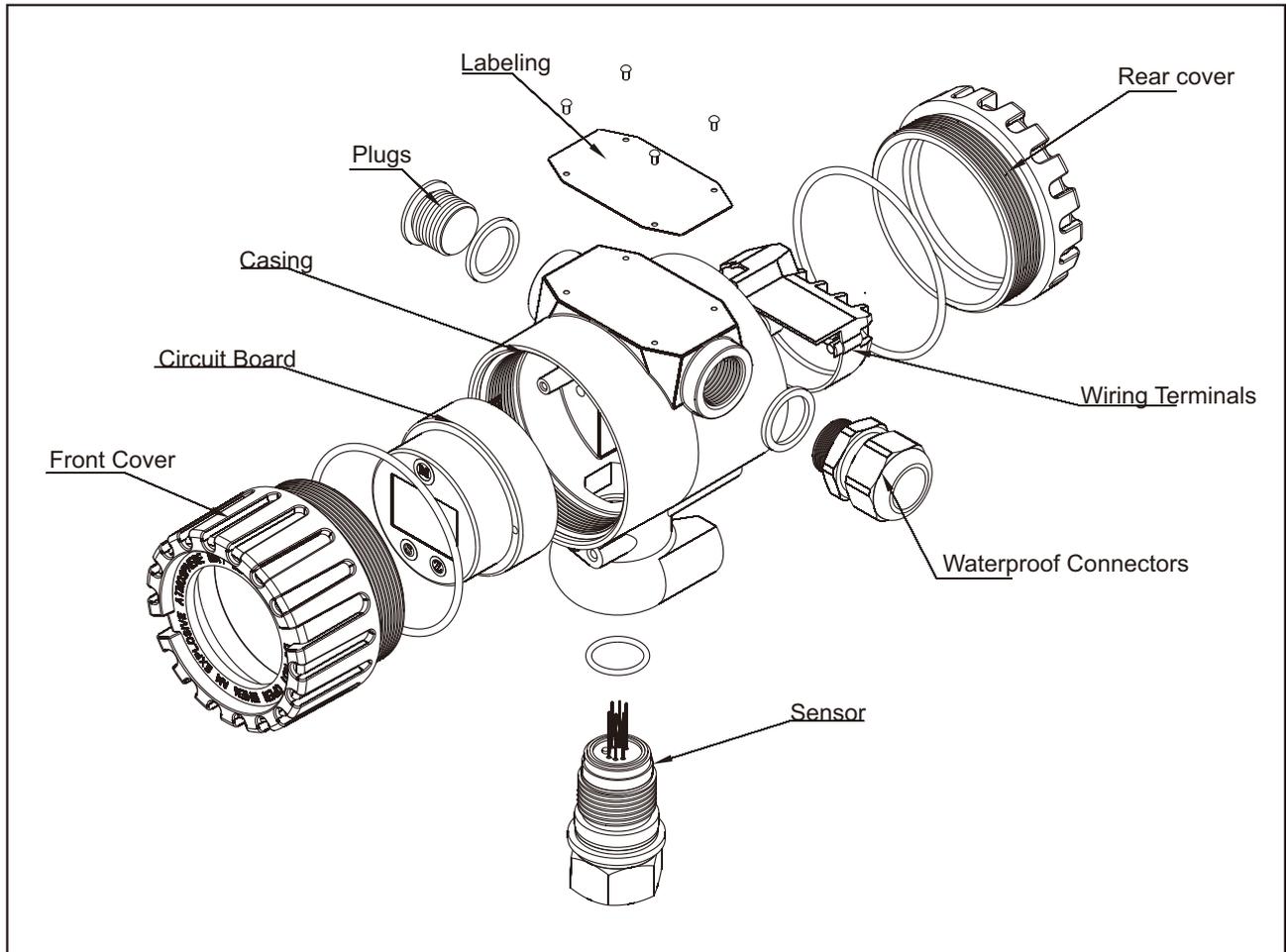


Figure 1 PY605 Series Pressure (Absolute Pressure) Transmitter Parts Decomposition Diagram

Dimension Drawing (mm)

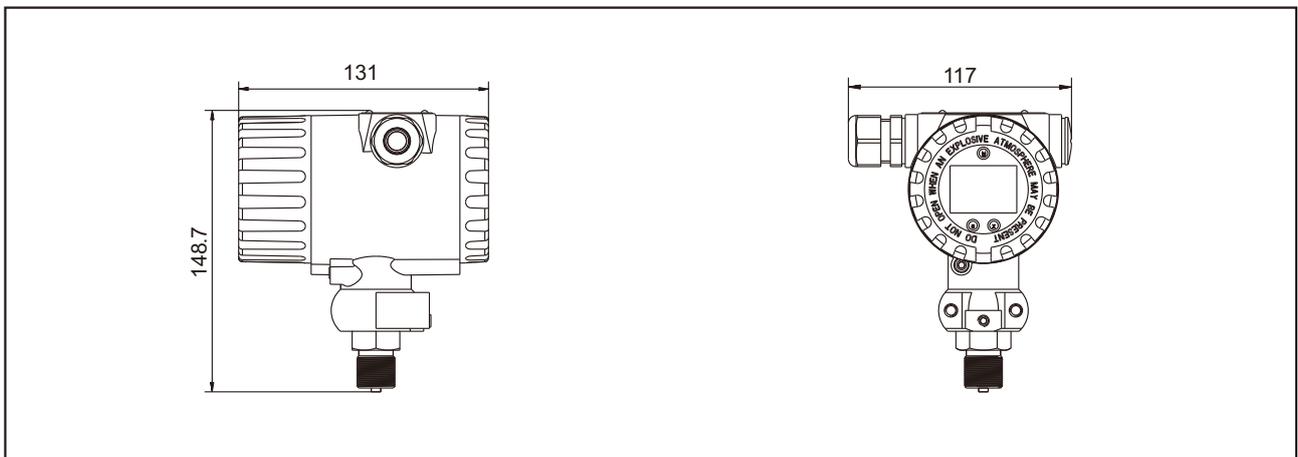


Figure 2 PY605 Series Pressure (Absolute Pressure) Transmitter Dimension Drawing

Mounting structure

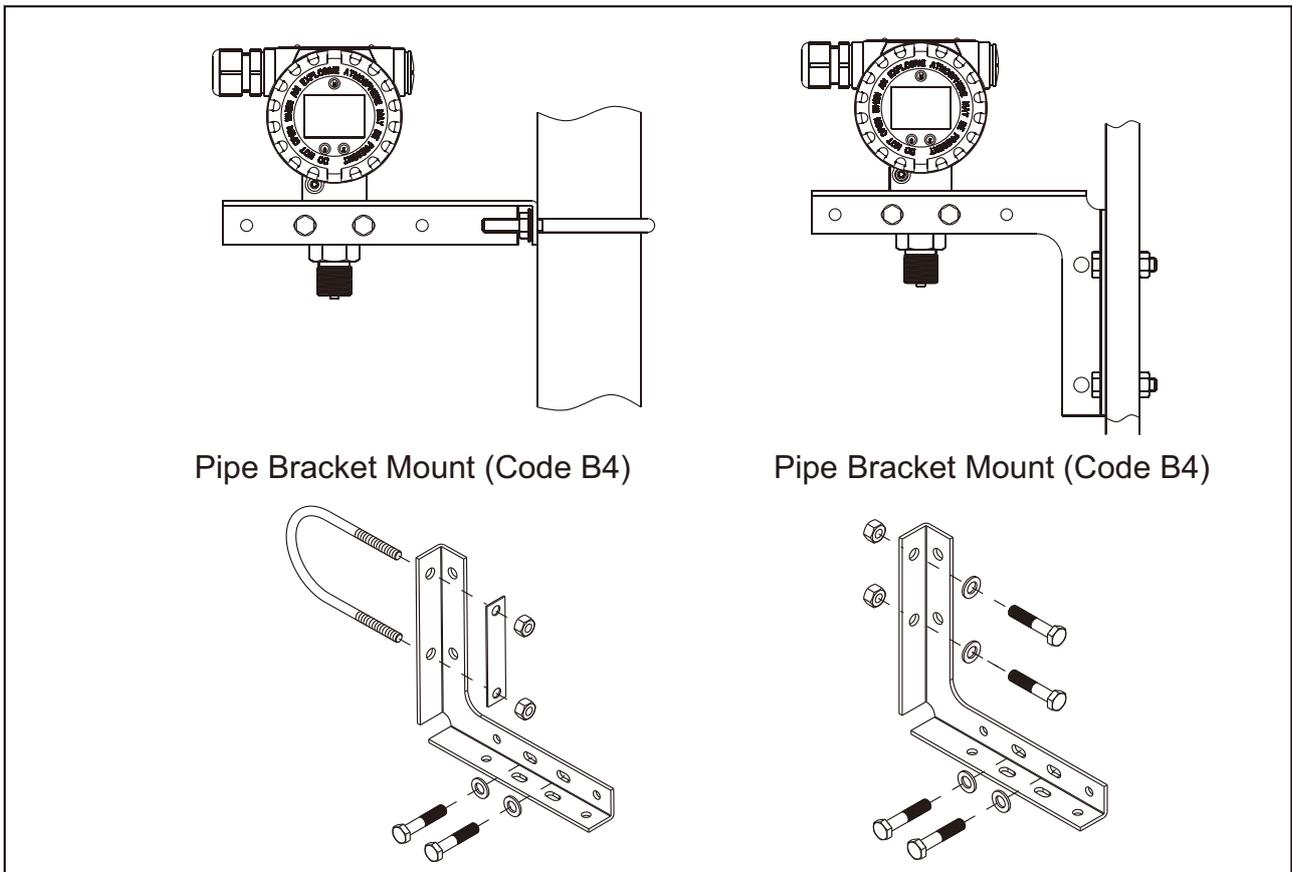


Fig. 3 Transmitter Mounting Structure with Optional Mounting Bracket

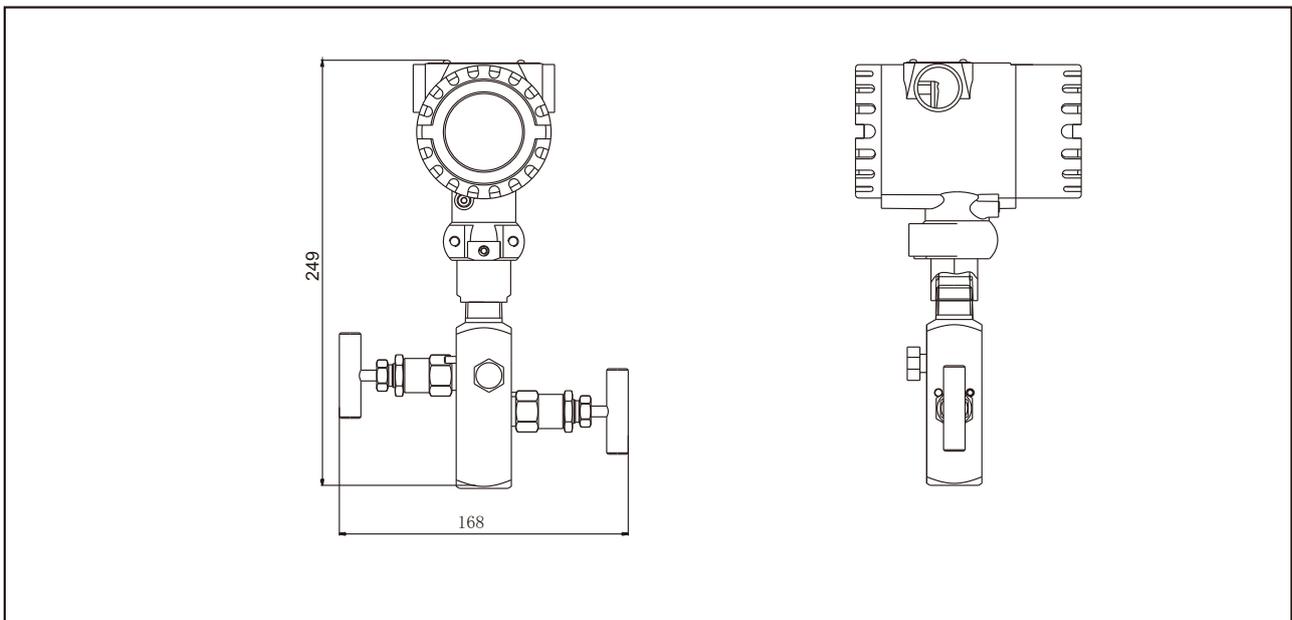


Fig. 4 Dimensional drawing of assembly with two-valve manifold (mm)

Product Selection

Type	Parameters	Code	Description	Provide quick(*)
		PY 681G	Monocrystalline silicon pressure transmitter	*
Sensors				
	Range Code	R006K2	-60mbar~60mbar	*
		R040K3	-400mbar~400mbar	
		R250K4	-2.5bar~2.5bar	
		R001M5	-1bar~10bar	
		R003M6	-1bar~30bar	
		R010M7	-1bar~100bar	
		R040M8	-1bar~400bar	
		R080M9	-1bar~800bar	
		Isolation Diaphragm Material	S	316L Stainless Steel
	C		Hastelloy C	
	Isolation Filling Fluid	G	Normal temperature silicone oil for direct contact temperature range -45-205°C	
		F	Fluorine oil, suitable for direct contact temperature range -45-160°C	
	Sealing Method	O	O-ring, PTFE (temperature applicable range: -100-280°C)	*
Output method				
	Signal output method	H	4-20mA+HART (2-wire), supply voltage 16.5-55VDC	*
		N	4-20mA (2-wire), supply voltage 10.5-55VDC	
		M	Modbus-RTU/RS485 (4-wire), supply voltage 12-32VDC	
	Display method	D	With LCD display module	*
		N	Without display	
Electrical connections				
	Electrical connections	T1	Aluminum alloy junction box, two outlets with internal thread M20*1.5	*
	Outlet protectors	A1	Explosion-proof configuration, one end with 1/2NPT female thread, the other end with plug, stainless steel, for wire diameter 6-8mm, protection class IP67	*
		A2	One end with M20*1.5 waterproof connector, the other end with plug, PVC material, applicable to wire diameter 6-8mm, protection grade IP67	
		A3	Explosion-proof configuration, one end with female thread M20*1.5, the other end with plug, stainless steel, for wire diameter 6-8mm, protection class IP67	
Process Connections				
	Type	D0	M20*1.5 male thread/bore Ø3 (standard)	*
		D1	M20*1.5 male thread/bore Ø10 (viscous media)	
		D2	NPT1/2 female thread	
		D3	NPT1/4 male thread	
		D4	Other	

Product Selection

Type	Parameters	Code	Description	Provide quick delivery(*)
Certifications				
	Hazardous Location Approval	D	Ordinary type (without explosion-proof)	*
		N	Explosion-proof (Exd II Ct6)	
		I	Intrinsically safe (Exia II Ct6)	
Other				
	Mounting Bracket	N	No Bracket	*
		B4	Pipe Bend Bracket, 2" Pipe	
		B5	Flush Mount Bracket	
	Integral manifold mounting	N	None	*
		V2	Two-valve manifold	
	Test Report	Q1	Factory Inspection Data	*
		Q2	CANS Certificate	

Factory specification

Project	Menu	Factory setting
Instrumentation station	No	NO
Output type	mA	LINER
Display	DISP	PV
Fault Alarm	ALARM	NO

Project	Menu	Factory setting
Damp	DAMP	NO
4mA low limit value	LRV	Setting by order
20mA high limit value	URV	Setting by order
Unit	U	Setting by order