# Monoflange level Transmitter
# Model PY683L

## Description

PY 683L monoflange level 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 | 40mbar-10bar, see selection table for details |
| Output Signal | 4-20mA/4-20mA+HART/Modbus-RTU/RS485 and others |
| accuracy | ±0.075% upper range limit, optional ±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 | 360º rotatable local display screen |
| 9 | Convenient local zero function |

# Specifcations

## Scale and Range Limits

| Nominal Range | Minimum Range | Lower Range(LRL) | Upper Range(URL) |
|---|---|---|---|
| F040K1 | 40mbar | -400mbar | 400mbar |
| F250K2 | 50mbar | -2.5bar | 2.5bar |
| F001M3 | 1bar | -10bar | 10bar |
| If URV≥LRV, URV≥minimum range; If URV≤LRV, LRV>minimum range. | | | |
| Overpressure limit value: depends on the weakest part of the pressure-bearing capacity, the overload pressure is the maximum<br>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: ±0.075% of upper range limit
- Annual Stability: ±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°C±5°C | | | |
|---|---|---|---|
| accuracy | TD≤10(1) | ±0.075%F.S | 250kPa,1MPa, 3MPa,10MPa |
| | 10<TD≤100 | ± 【0.025+0.05 $\frac{X}{SPAN}$ 】% | |
| Square root output accuracy is reference accuracy *1.5 | | | |
| 1: TD is ranges, TD=URL/ \|URV-LRV\| | | | |

## X value

| Nominal range | X value |
|---|---|
| F040K1 | 40mbar |
| F250K2 | 250mbar |
| F001M3 | 1bar |

## Ambient Temperature Effect

Total Impact over the range of -20 to 80°C
±(0.1+0.1TD)% upper range limit

## Static pressure effect

±0.15%/10MPa upper range limit

## Power supply effect

±0.005% upper range limit/V

## Static Pressure Limit and Maximum Overpressure

Limits are 0 psia to the lesser of the flange rating or the sensor pressure rating.

| Pressure Ratings | | | |
|---|---|---|---|
| Standard | Type | Carbon Steel Ratings | Stainless Steel Ratings |
| ANSI/ASME | Class150 | 285psig | 275psig |
| ANSI/ASME | Class300 | 740psig | 720psig |
| ANSI/ASME | Class600 | 1480psig | 1440psig |
| Values tested at 38°C, ratings decrease with increasing temperature | | | |
| DIN | PN 10/40 | 40bar | 40bar |
| DIN | PN 10/16 | 16bar | 16bar |
| DIN | PN 25/40 | 40bar | 40bar |
| Tested values at 120°C, ratings decrease with increasing temperature | | | |

## Installation position effect

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 |

# Specifcations

## 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

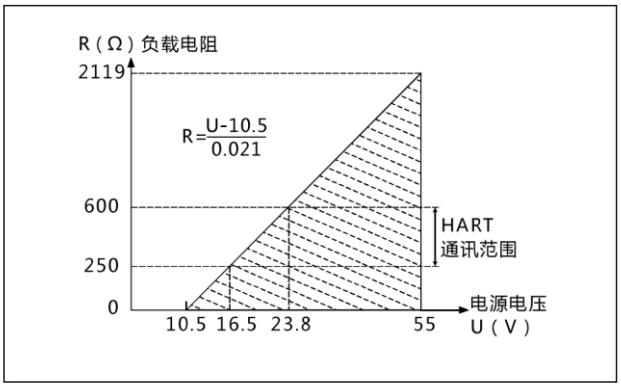
- Ambient temperature range: -40-85°C, integrated LCD display: -20-70°C
- Humidity limit range: -40-110°C, integrated without display: -40-85°C
- Process temperature limit range:
  Silicone oil filled sensor: -40-121°C
  Fluorine-filled sensor: -30-121°C
- Storage ambient temperature range: 0-100% relative humidity
- Protection class: Ip67
- Hazardous area: ExdIICT6,ExiaIICT6

*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

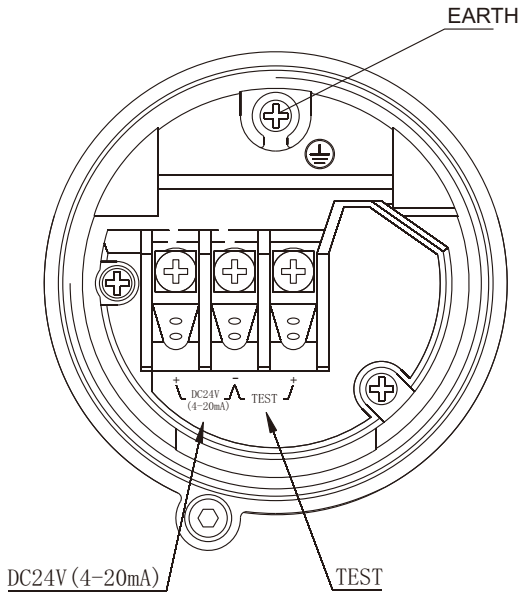
| Code | Test Item | Standard | Test Condition | Performance Class |
|---|---|---|---|---|
| 1 | Electrostatic Discharge Immunity | IEC 61000-4-2 | 6kV(Contact), 8kV(Air) | B |
| 2 | Radio-frequency Field | IEC 61000-4-3 | 10V/m;80MHz ~ 6GHz; 80%AM(1kHz) | A |
| 3 | Power Frequency Magnetic Field | IEC 61000-4-8 | Stable sustained magnetic feld strength50Hz,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.

# Specifcations

| Basic information | |
|---|---|
| **Transmission Module Type** | 4-20mA+HART,LCD/case three keys<br>4-20mA,LCD/case three keys |
| **Display screen** | ■ PV: Main screen displays the process variable and the secondary screen displays the percentage and progress bar<br>■ mA: Main screen shows current value, secondary screen shows percentage and progress bar<br>■ %: Main screen displays percentage, secondary screen displays percentage and progress bar |
| **Measurement range setting** | Upper limit, 20mA output<br>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<br>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** | ■ No Alarm<br>■ High Alarm<br>■ 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

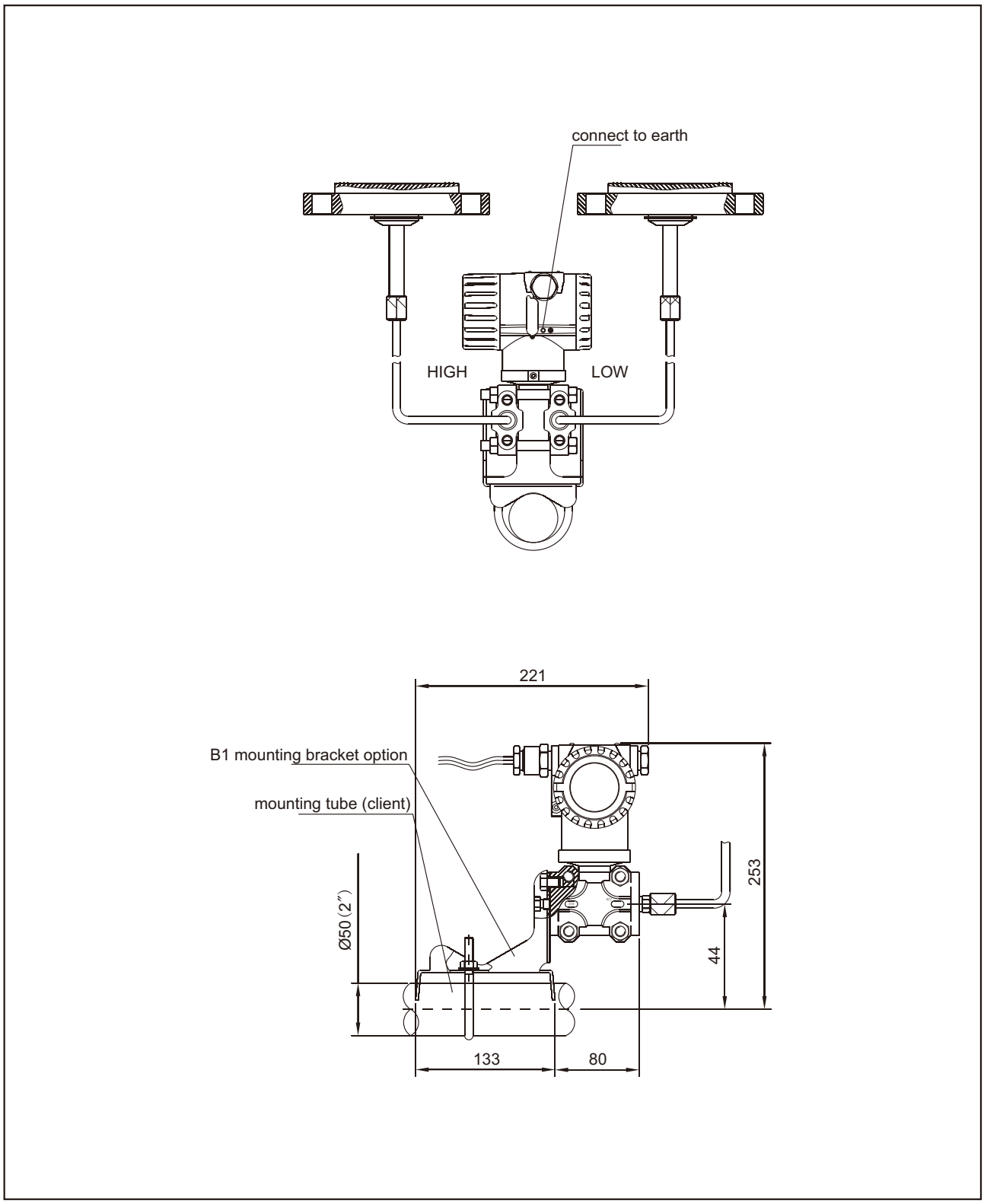
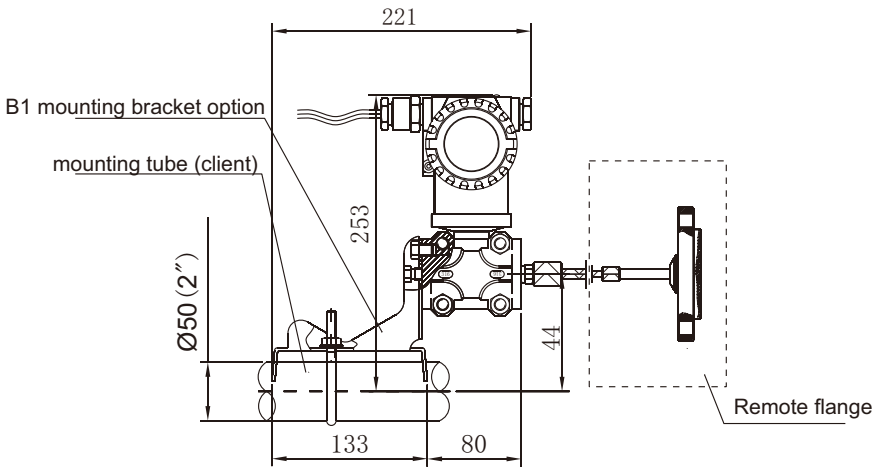
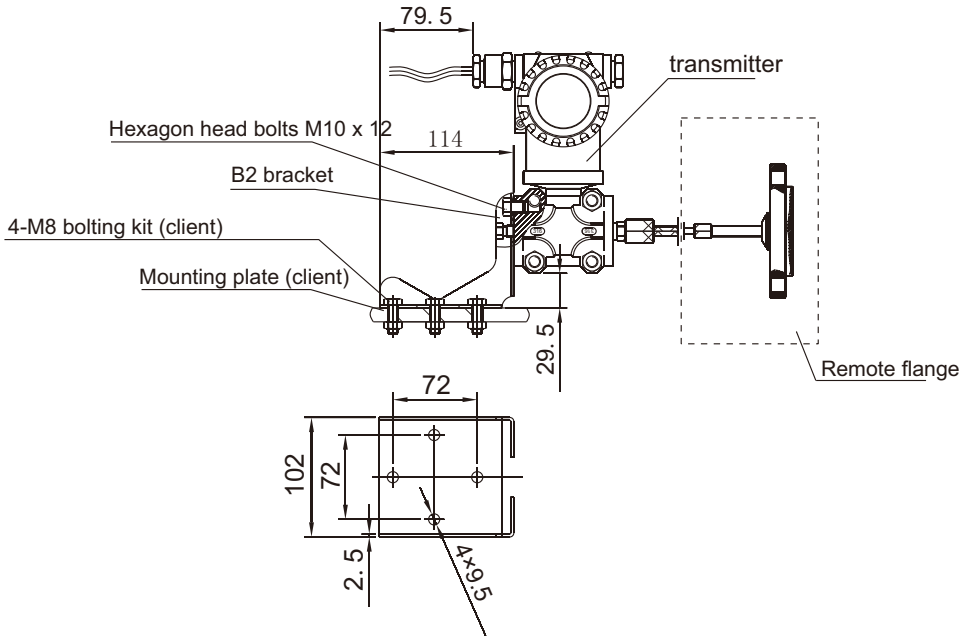



Figure 1 Double-flange remote transmitter installation outline diagram (mm)

# Mounting structure



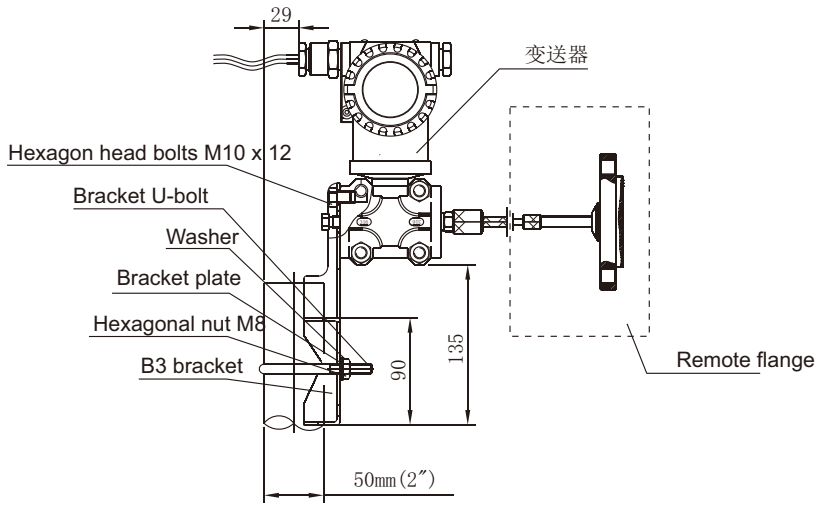

Pipe fitting (code B1)



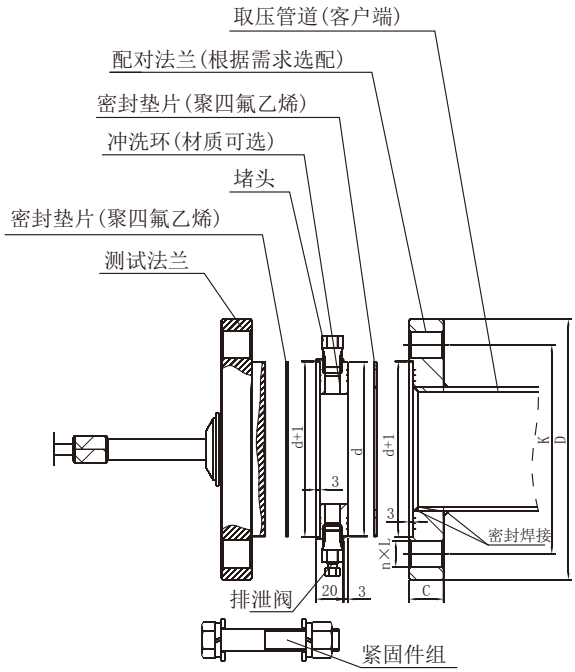

Pipe fitting (code B2)

Figure 2 Bracket assembly (mm)

# Process connection type




Pipe fitting (code B3)




F1/F2 冲洗环

**Figure 3 Process connection type**

# Process connection type

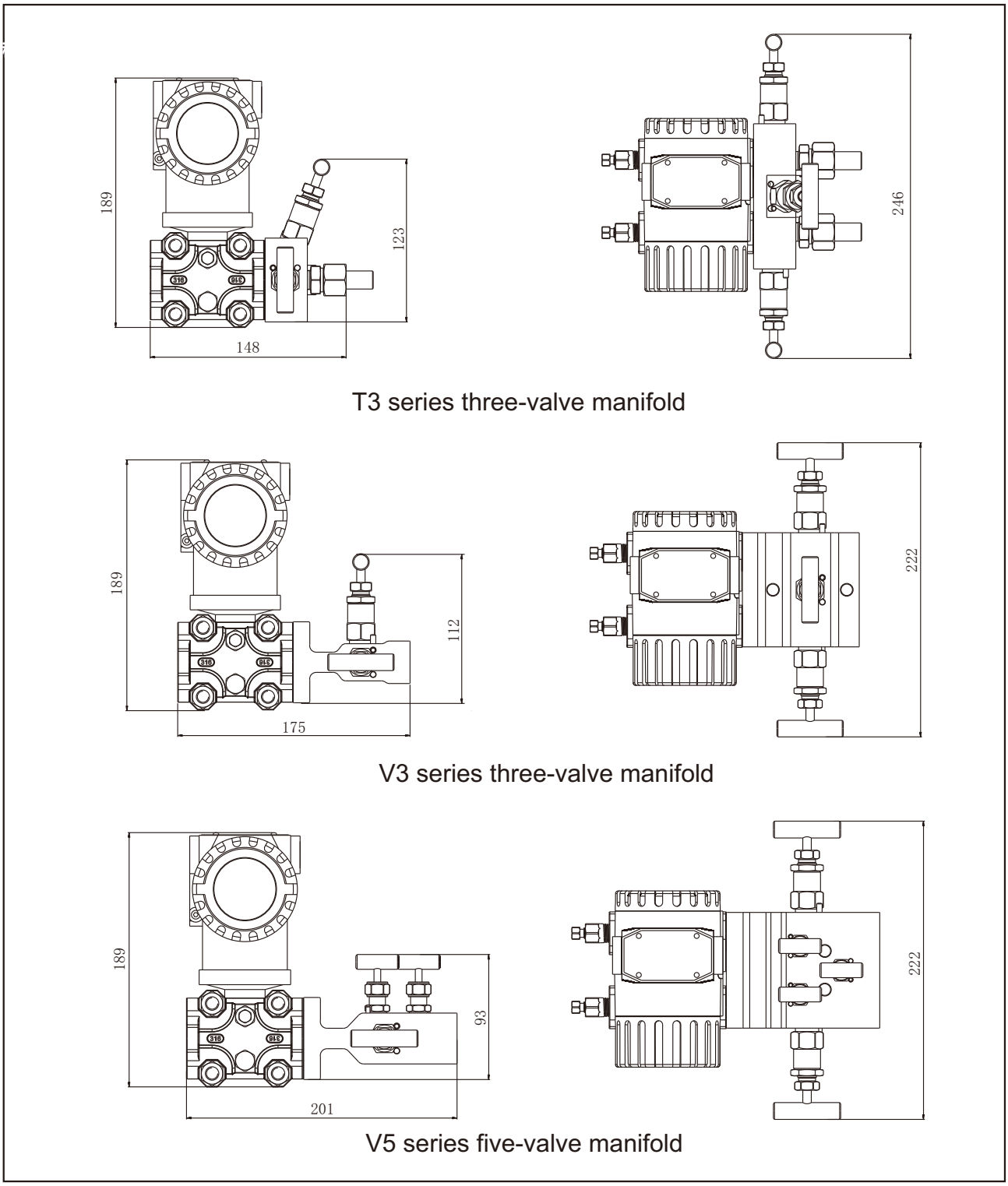



Figure 4 Dimensions of integrated manifold components (mm)

# Product Selection

| Type | Parameters | Code | Description | Provide quick(*) |
|---|---|---|---|---|
| | | PY 683L | monoflange level transmitter | * |
| Sensors | | | | |
| | Range Code | F040K1 | -400mbar~400mbar | |
| | | F250K2 | -2.5bar~2.5bar | |
| | | F001M3 | -1bar~10bar | |
| | | 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 | |
| Flange Options | | | | |
| | Flange connection form | D0 | H-type structure, double flange, process connection female thread 1/4-18NPT, flange back end with exhaust air vent, 316 stainless steel | * |
| | | D1 | H-type structure, double flange, process connection female thread 1/4-18NPT, flange back end with self-venting air vent, 304 stainless steel | |
| | | D2 | H-type structure, double flange, process connection female thread 1/4-18NPT, flange side underneath the self-contained exhaust valve, 316 stainless steel | |
| | | D3 | H-type structure, double flange, process connection female thread 1/4-18NPT, flange side upper self contained exhaust valve, 316 stainless steel | |

# Product Selection

| Type | Parameters | Code | Description | Provide quick delivery(*) |
|---|---|---|---|---|
| Process Connections | | | | |
| | Type | P | Without process connector (1/4NPT female thread on chamber flange) | * |
| | | N | With “waist” joints: 1/2NPT tapered pipe female threads | |
| | | J | With “D” fitting: M20*1.5 male thread and rear welded lead-in pipe | |
| | | C | With “waist” joint with 1/2 NPT lead transition head and rear welded lead pipe | |
| 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 | B1 | Tube Mount Bend Bracket, 2” Tube, Mating Mounting Kit, Carbon Steel, for H-Frames | * |
| | | B2 | Tube Mount Flat Bracket, 2” Tube, Mating Mounting Kit, Carbon Steel, for H-Section | |
| | | B3 | Plate Mount Curved Bracket, Mating Mounting Kit, Carbon Steel, for H-Shaped Construction | |
| | Integral manifold mounting | N | None | * |
| | | T3 | Three-valve manifold | |
| | | V3 | Three-valve manifold | |
| | | V5 | Five-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 |