# FC3351 Series Intelligent High-Precision Monocrystalline Silicon Differential

## Product Introduction

FC3351 Series intelligent pressure /Differential pressure transmitter, the center sensing unit adopts the world's leading high-precision silicon pressure and differencePressure sensor technology and packaging process, single crystal silicon pressure, differential pressure sensor is located at the top of the metal body, away from the contact surface of the medium. Achieve mechanical and thermal isolation; The glass sintered sensor leads realize high-strength electrical insulation with the metal matrix. Improved flexibility of electronic circuits and ability to withstand transient voltages. Platinum grade accuracy achieved ±0.05%, one-way overvoltageUp to 25MPa。 Excellent static pressure performance, static pressure error can be optimally controlled ±0.05%/10MPa Within, temperature shadowThe change in response is minimal and optimally controllable ±0.04%/10K。

In the circuit design, the model with microprocessor as the core and supplemented by advanced digital isolation technology is adopted Block design to makeThe instrument has high anti-interference and stability. useHart Protocol to communicate, can be passed Hart Hand communicator or mounting Hart The software computer is operated remotely, and the measurement information configuration is completed while using digital compensation technology and throughThe temperature sensor compensates the transmitter, improves the measurement accuracy, reduces the temperature drift, and has good long-term stability. High reliability. The most humanized design of infrared wireless setting, one-key zero clearance function, to meet the requirements of safe operation in dangerous occasions, very convenient shortcut menu operation, and can complete all parameter settings, comprehensively improve the performance of the transmitter.

## Characteristic

- Advanced monocrystalline silicon pressure sensor technology and packaging process, carefully developed an international leading technology ultra-high performance pressure, differential pressure transmitter
- The modular design with microprocessor as the core and assisted by advanced digital isolation technology makes the instrument highly anti-interference and stable
- Powerful 24-bitADC for high accuracy
- Innovative double compensation technology real 0.075 High precision

## Functional Parameters

| | |
|---|---|
| Range limit | Within the upper and lower limits of the measuring range, it can be adjusted arbitrarily It is recommended to choose a quantum code with the lowest possible quantum ratio to optimize performance |
| Zero point setting | The zero point and range can be adjusted to any value within the measuring range in the table, as long as the standard range ≥ the minimum range |
| Effect of installation location | If the installation position changes perpendicular to the diaphragm surface will not cause zero drift effect, if the installation position and the diaphragm surface change by more than 90° , the zero position effect within the range of <0.4kPawill occur, and the zero adjustment can be adjusted and corrected, without range effect |
| output | 2-wire 4-20mAcompliant with NAMIR NE43 specifications with a selectable linear or square root output for superimposed digital signals (Hart protocol). |
| Output signal limit | Imin=3.9mA,Imax=21.0mA |
| Fault warning | If a sensor or circuit fails, the automatic diagnostics function automatically outputs 3.9 or 21.0mA(user preset). |
| Alarm current | Low Alarm Mode (Minimum): 3.9mA |
| High report mode (maximum) | 21 mA |
| Alarm current default settings | High report mode |
| Response time | The damping constant of the amplifier component is 0.1s; The sensor time constant is 0.1 ~ 1.6s,depending on the range and span ratio. Additional adjustable time constants are:0 ~ 100s |
| Warm-up time | <15s |

## Performance Parameters

| | |
|---|---|
| Measuring medium | Gases, vapours, liquids |
| Inaccuracy | ± 0.05%, ±0.075%, ±0.1%(including linearity, differential and repeatability from zero). |
| stability | ±0.1%/3 years |
| Ambient temperature effects | ⩽ ±0.04%URL/10℃ |
| Static pressure influence | ±0.05%/10MPa |
| power supply | 10 ~ 36V DC（recommend 24V DC） |
| Power impact | ±0.001% /10V (10 ~ 36V DC),negligible |
| The reference accuracy of the modulation | If TD>10 (TD= maximum range / regulated range), it is: ±(0.075×TD)% square root output accuracy is 1.5 of the upper linear reference accuracy times |
| Ambient temperature | −40℃ ~85℃ |
| Measure the temperature of the medium | −40℃ ~120℃ |
| Storage temperature | −40℃ ~105℃ |
| display | LCD、OLED |
| The monitor shows the module temperature | −20℃ ~70℃（LCD）、−40℃ ~80℃（OLED） |

## Overload And Static Pressure

| | Range | Unilateral overload (negative terminal) | Unilateral overload (positive side) | Bilateral static pressure |
|---|---|---|---|---|
| A | 1KPa | 1MPa | 1MPa | 16MPa |
| B | 6KPa | 2MPa | 2MPa | 16MPa |
| C | 40KPa | 3MPa | 3MPa | 25MPa |
| D | 400KPa | 10MPa | 10MPa | 25MPa |
| And | 4MPa | 10MPa | 10MPa | 25MPa |

## Electromagnetic Compatibility (EMC).

| The test field is strong | Frequency range | EUT placement | Polarization direction | Detection results | | |
|---|---|---|---|---|---|---|
| | | | | Product number | | |
| | | | | 24283 | 24281 | 24282 |
| 3V/m | 80MHz−1GHz | Upright | Horizontal polarization | The memory data of the test sample does not change | The memory data of the test sample does not change | The memory data of the test sample does not change |
| | | | Vertical polarization | The memory data of the test sample does not change | The memory data of the test sample does not change | The memory data of the test sample does not change |

| Magnetic field strength | Test results | | |
|---|---|---|---|
| | Product number | | |
| | 24283 | 24281 | 24282 |
| 400A/m（X、Y、Z） | The memory data of the test sample does not change | The memory data of the test sample does not change | The memory data of the test sample does not change |

## Physical Parameters

| | |
|---|---|
| Measuring the membrane cartridge | Stainless steel 316L |
| diaphragm | Stainless steel 316L, HastelloyC |
| Process flange | Stainless steel 304,316L |
| Nuts and bolts | Carbon steel galvanized, stainless steel |
| Filling solution | Silicone oil, fluorine oil, high temperature silicone oil, etc |
| Sealing rings | Nitrile rubber, fluoroelastomer, polytetrafluoroethylene |
| Transmitter housing | Made of aluminum alloy, the exterior is sprayed with epoxy resin |
| Housing seals | nitrile rubber |
| nameplate | Stainless steel 304 |
| weight | 2.6kg (without: mounting bracket, process connection). |
| Enclosure rating | IP67 |
| Explosion-proof rating | Exd Ⅱ CT6、Exia II. CT6 |

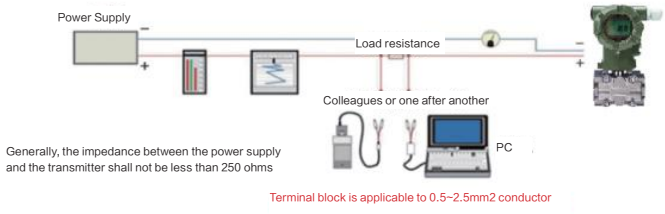
## Installation

### Power and load conditions

The supply voltage is 24V,R ≤ (Us-10V)/I max Ω wherel max=21 mA

Maximum supply voltage: 36VDC Minimum supply voltage:10VDC

Digital communication load range: 250 ~ 600Ω

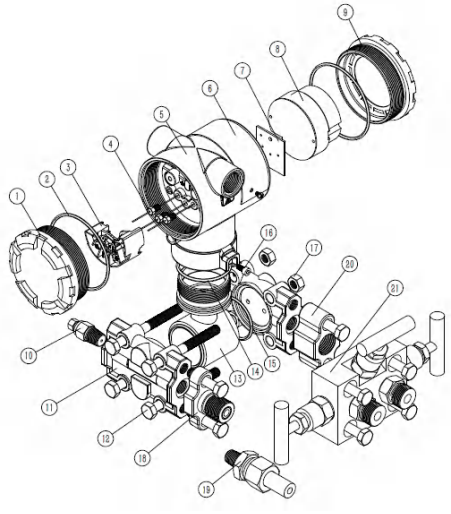



### Process connection

The two end faces of the process connection flange are NPT1/4 和 M10 或 UNF7/16 Internal thread.

## Typical Product Assembly Exploded View

| | | | |
|---|---|---|---|
| 01 | Rear end cover | 02 | End cap seals |
| 03 | Terminal blocks | 04 | Through-core capacitors |
| 05 | Housing | 06 | Signs |
| 07 | Anti-interference board | 08 | Circuit meter header |
| 09 | Show end caps | 10 | Exhaust drain valve |
| 11 | cleat | 12 | M8 screws |
| 13 | sensor | 14 | Housing seals |
| 15 | Sensor seals | 16 | The housing locks the top wire |
| 17 | M8 nut | 18 | T-connector ( optional ). |
| 19 | Welded pipe fittings ( optional ). | 20 | Waist flange ( optional ). |
| 21 | Integrated three-valve block ( optional ). | | |

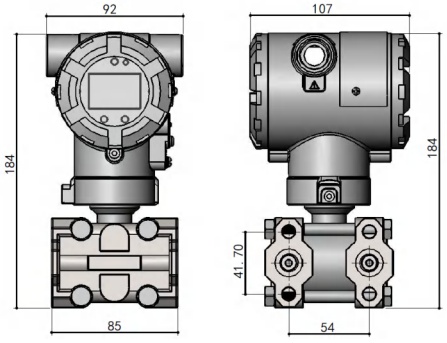


# FC3351DP Intelligent Differential Pressure Transmitter

## Range

| Quantum code | Measuring range (KPa). | Measuring range (KPa). | Accuracy / stability |
|---|---|---|---|
| A | −1 ~ 1 | 0.1 ~ 1 | Range ±0.075%F. S/ The maximum error per yearis ±0.1%of the span |
| B | −6 ~ 6 | 1 ~ 6 | |
| C | −40 ~ 40 | 6 ~ 40 | |
| D | −100 ~ 400 | 40 ~ 400 | |
| E | −100 ~ 4000 | 400 ~ 4000 | |

## Overall Dimension




## FC3351DPIntelligent differential pressure transmitter selection table

| code | type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DP | Intelligent differential pressure transmitter | | | | | | | | | |
| | code | Differential pressure range (KPa). | | | | | | | | |
| | A | 0.1 ~ 1 | | | | | | | | |
| | B | 1 ~ 6 | | | | | | | | |
| | C | 6 ~ 40 | | | | | | | | |
| | D | 40 ~ 400 | | | | | | | | |
| | E | 400 ~ 4000 | | | | | | | | |
| | | code | Output signal | | | | | | | |
| | | E | 4 ~ 20mA | | | | | | | |
| | | S | 4 ~ 20mA+Hart | | | | | | | |
| | | J | Square root 4 ~ 20mA | | | | | | | |
| | | | code | display | | | | | | |
| | | | M1 | LCD | | | | | | |
| | | | M2 | OLED (low temperature resistant −40℃ ). | | | | | | |
| | | | | code | Pressure method | | | | | |
| | | | | C0 | NPT1/4 Pressure Optic Joint and Rear Welded Pressure Pipe F14 | | | | | |
| | | | | C1 | NPT1/2 cone pipe female thread waist flange | | | | | |
| | | | | C2 | T−shaped male connector M20*1.5 | | | | | |
| | | | | C3 | Integrated triple manifold | | | | | |
| | | | | | code | Structural material | | | | |
| | | | | | | Flange construction | Drainage / Venting | diaphragm | | |
| | | | | | 21 | 304 stainless steel | 304 stainless steel | 316L stainless steel | | |
| | | | | | 22 | 316 stainless steel | 316 stainless steel | 316L stainless steel | | |
| | | | | | 23 | 316 stainless steel | 316 stainless steel | Hastelloy C | | |
| | | | | | 24 | 316 stainless steel | 316 stainless steel | Monel alloys | | |
| | | | | | 25 | 316 stainless steel | 316 stainless steel | tantalum | | |
| | | | | | 26 | Hastelloy C | Hastelloy C | Hastelloy C | | |
| | | | | | 27 | Hastelloy C | Hastelloy C | tantalum | | |
| | | | | | 28 | Monel alloys | Monel alloys | Monel alloys | | |
| | | | | | | code | Bleed valve | | | |
| | | | | | | X0 | Exhaust valve | | | |
| | | | | | | X1 | Drain valve | | | |
| | | | | | | | code | Mounting bracket | | |
| | | | | | | | B0 | No mounting brackets | | |
| | | | | | | | B1 | Tube bending bracket | | |
| | | | | | | | B2 | Plate bending bracket | | |
| | | | | | | | B3 | Flat bracket for tubes | | |
| | | | | | | | | code | Hazardous Location Certification (Normal Type Not Filled In) | |
| | | | | | | | | E0 | No explosion proof | |
| | | | | | | | | E1 | Flameproof version, explosion−proof class Exd II. CT6 | |
| | | | | | | | | E2 | Intrinsically safe, Exia II. CT6 | |
| | | | | | | | | | code | Electrical connection |
| | | | | | | | | | D1 | M20*1.5 standard |
| | | | | | | | | | D2 | User specified |
| DP | A | E | M1 | C1 | 21 | X0 | B1 | E1 | D1 | Selection examples |

# FC3351-B GP/AP Intelligent Direct Mount Pressure /Absolute Pressure Transmitter

## Gauge pressure range

| Quantum code | Measuring range (KPa). | Measuring range (KPa). | Accuracy / stability |
|---|---|---|---|
| A | −6 ~ 6 | 1 ~ 6 | Range ±0.075%F.S/ The maximum error per year is the span ±0.1% |
| B | −40 ~ 40 | 6 ~ 40 | |
| C | −100 ~ 250 | 40 ~ 250 | |
| D | −100 ~ 2000 | 250 ~ 2000 | |
| And | −100 ~ 10000 | 2000 ~ 10000 | |
| G | −100 ~ 40000 | 10000 ~ 40000 | |

## Absolute pressure range

| Quantum code | Measuring range (KPa). | Measuring range (KPa). | Accuracy / stability |
|---|---|---|---|
| A | 0 ~ 40 | 6 ~ 40 | Range ±0.075%F.S/ The maximum error per year is the span ±0.1% |
| B | 0 ~ 250 | 40 ~ 250 | |
| C | 0 ~ 2000 | 250 ~ 2000 | |

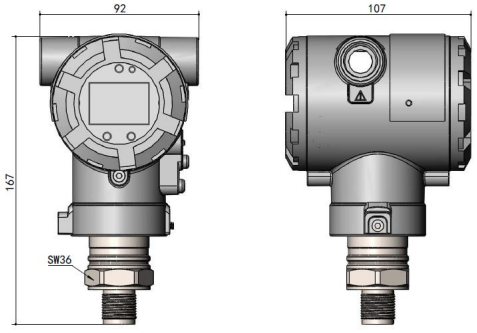
## Gauge overload limit

| Range | 6KPa A | 40KPa B | 250KPa C | 2000KPa D | 10000KPa E | 21000KPa F | 40000KPa G |
|---|---|---|---|---|---|---|---|
| Overload limit | 0.2MPa | 1MPa | 4MPa | 16MPa | 20MPa | 50MPa | 50MPa |

## Absolute overload limit

| Range | 40KPa A | 250KPa B | 2000KPa C |
|---|---|---|---|
| Overload limit | 1MPa | 4MPa | 16MPa |

## Overall Dimension



## FC3351-B GP/AP Intelligent Direct Mount Pressure / Absolute Pressure Transmitter Selection Table

| code | type |
|---|---|
| GP | Intelligent direct-mounted gauge pressure transmitter |
| AP | Intelligent direct-mounted absolute pressure transmitter |

| code | Gauge pressure range (KPa). | Absolute pressure range (KPa). |
|---|---|---|
| A | 1 ~ 6 | 6 ~ 40 |
| B | 6 ~ 40 | 40 ~ 250 |
| C | 40 ~ 250 | 250 ~ 2000 |
| D | 250 ~ 2000 | |
| E | 2000 ~ 10000 | |
| F | 10000 ~ 21000 | |
| G | 10000 ~ 40000 | |

| code | Output signal |
|---|---|
| E | 4 ~ 20mA |
| S | 4 ~ 20mA+Hart |

| code | display |
|---|---|
| M1 | LCD |
| M2 | OLED (Hart optional ). |

| code | Process connection |
|---|---|
| C1 | External thread M20*1.5 |
| C2 | G1/2 male thread |
| C3 | G1/4 male thread |
| C4 | 1/2NPT male thread |
| C5 | 1/2NPT female thread |
| T | Special Requirements |

| code | Hazardous Location Certification (Normal Type Not Filled In) |
|---|---|
| E0 | No explosion proof |
| E1 | Flameproof version, explosion-proof class Exd II. CT6 |
| 12 | Intrinsically safe, Exia II. CT6 |

| code | Electrical connection |
|---|---|
| D1 | M20*1.5 standard |
| D2 | User specified |

| code | Special equirements |
|---|---|
| T | Customer specified |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| GP | A | E | M1 | C1 | E1 | D1 | T | Selection examples |

# FC3351LT/CLT Intelligent Flat Membrane Flange/Socket Flange Level Transmitter

## Range

| Quantum code | Minimum range (KPa). | Maximum Range (KPa). | Rated pressure (max.) |
|---|---|---|---|
| B | 1 | 6 | The rated pressure of the level flange |
| C | 6 | 40 | |
| D | 40 | 400 | |
| E | 400 | 4000 | |

## Comparison Table Of The Relationship Between Level Flange And Minimum range

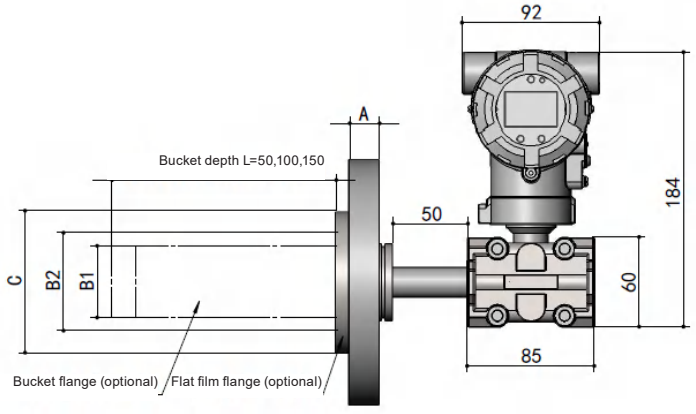
| Level flange | Nominal diameter | Minimum range |
|---|---|---|
| Flat membrane type | DN 50/2" | 10KPa |
| | DN 80/3" | 1KPa |
| | DN 100/4" | 1KPa |
| Cartridge type | DN 50/2" | 16KPa |
| | DN 80/2" | 1KPa |
| | DN 100/4" | 1KPa |

## Level Flange Rated Pressure

| | |
|---|---|
| ANSI standard | 150psi ~ 600psi |
| DIN standard | PN 1.6MPa ~ PN 10MPa |

## One-Way Overload Limit

The low-pressure side is the rated pressure of the transmitter body, and the high-pressure side is the rated pressure of the liquid level flange, and correctable zero drift mav occur.



## FC3351LT/CLT Intelligent Flat Membrane Flange / Socket Flange Level Transmitter Selection Table

| code | type |
|---|---|
| LT | Intelligent flat membrane flange level transmitter |
| CLT | Intelligent socket flange level transmitter |

| code | Pressure measurement range (KPa). |
|---|---|
| B | 1 ~ 6 |
| C | 6 ~ 40 |
| D | 40 ~ 400 |
| E | 400 ~ 4000 |

| code | Output signal |
|---|---|
| E | 4 ~ 20mA |
| S | 4 ~ 20mA+Hart |

| code | display |
|---|---|
| M1 | LCD |
| M2 | OLED (Hart optional ). |

| Structural material | | | | | |
|---|---|---|---|---|---|
| code | Flange material | code | Diaphragm material | code | coating |
| 22 | 304 stainless steel | N1 | 316L stainless steel | T1 | not |
| 23 | 316 stainless steel | N2 | Hastelloy C | T2 | Spray tetrafluoride |
| | | N3 | Monel alloys | | |
| | | N4 | tantalum | | |
| | | N5 | titanium | | |

| code | Installation dimensions |
|---|---|
| A | DN50 |
| B | DN80 |
| C | DN100 |
| D | 2” |
| E | 3” |
| F | 4” |
| G | Customer specified |

| code | Socket length (mm). |
|---|---|
| 10 | 0 ( flat flange ). |
| 11 | 50 |
| 12 | 100 |
| 13 | 150 |
| T | Customer specified |

| code | Capillary length (m). |
|---|---|
| L1 | 1m |
| L2 | 2m |
| L3 | 3m |
| L4 | Customer specified |

| code | Mounting bracket |
|---|---|
| A1 | No mounting brackets |
| A2 | Tube bending bracket |
| A3 | Plate bending bracket |
| A4 | Flat bracket for tubes |

| code | Hazardous Location Certification (Normal Type Not Filled In) |
|---|---|
| E0 | No explosion proof |
| E1 | Flameproof version, explosion-proof class Exd II. CT6 |
| E2 | Intrinsically safe, Exia II. CT6 |

| code | Electrical connection |
|---|---|
| D1 | M20*1.5 standard |
| D2 | User specified |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LT | B | E | M1 | 22 N1 T1 | A | 10 | L1 | A1 | E0 | D1 | Selection examples |

# FC3351DY/GY Intelligent Remote Transmission Flat Membrane Flange/Socket Flange Differential Pressure And Pressure Transmitter

## Range

| Quantum code | Minimum range | Maximum capacity | Rated pressure (max.) |
|---|---|---|---|
| B | 1KPa | 6KPa | The rated pressure of the level flange |
| C | 6KPa | 40KPa | |
| D | 40KPa | 400KPa | |
| E | 400KPa | 4MPa | |

## Comparison Table Of The Relationship Between Level Flange And Minimum range

| Level flange | Nominal diameter | Minimum range | |
|---|---|---|---|
| | | One-way remote transmission | Bilateral far and far away |
| Flat membrane type | DN 50/2" | 10KPa | 10KPa |
| | DN 80/3" | 6KPa | 1KPa |
| | DN 4" | 6KPa | 1KPa |
| Cartridge type | DN 50/2" | 16KPa | 16KPa |
| | DN 80/2" | 6KPa | 1KPa |
| | DN 4" | 6KPa | 1KPa |

## Overall Dimension

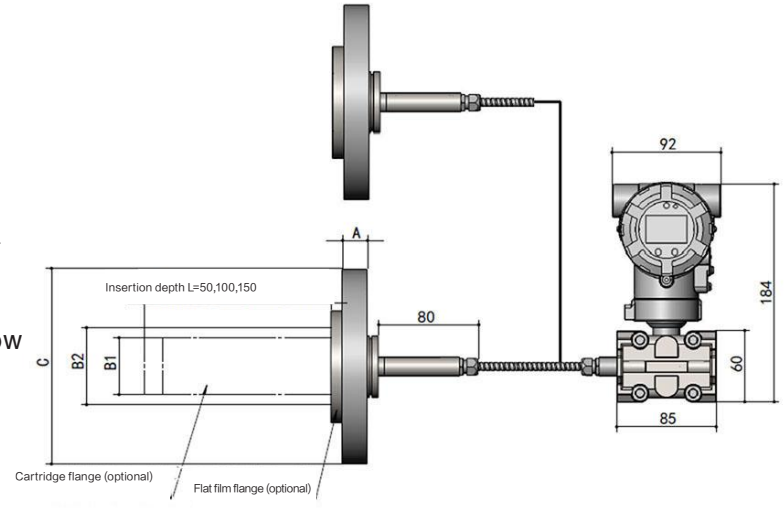
### Level flange rated pressure

ANSI standard：150psi ~ 600psi

DINstandard：PN 1.6MPa ~ PN 10MPa

### Unidirectional overload pole

The overload limit on the high and low pressure side is the rated



## FC3351DY/GY Intelligent Remote Differential Pressure/ Pressure Transmitter Selection Table

| code | type |
|---|---|
| DY | Intelligent remote differential pressure transmitter |
| GY | Intelligent remote pressure transmitter |

| code | Pressure measurement range (KPa). |
|---|---|
| B | 1~6 |
| C | 6~40 |
| D | 40~250 |
| E | 250~2000 |

| code | Output signal |
|---|---|
| E | 4~20mA |
| S | 4~20mA+Hart |

| code | display |
|---|---|
| M1 | LCD |
| M2 | OLED(Hart Optional ) |

Structural material

| code | Flange material | code | Diaphragm material | code | coating |
|---|---|---|---|---|---|
| 22 | 304 stainless steel | N1 | 316L stainless steel | T1 | not |
| 23 | 316 stainless steel | N2 | Hastelloy C | T2 | Spray tetrafluoride |
| | | N3 | Monel alloys | | |
| | | N4 | tantalum | | |
| | | N5 | titanium | | |
| | | N6 | Spray tetrafluoride | | |

| code | Installation dimensions |
|---|---|
| A | DN50 |
| B | DN80 |
| C | DN100 |
| D | 2″ |
| E | 3″ |
| F | 4″ |
| F | Customer specified |

| code | Remote transmission device |
|---|---|
| Y0 | Single flat flange type |
| Y1 | Double flat flange type |
| Y2 | Single insert flange type |
| Y3 | Double insert flange type |
| Y4 | One flat and one insert flange type |

| code | Capillary length |
|---|---|
| X0 | 1 metre |
| X1 | 2 meters |
| X2 | 3 meters |
| X3 | User specified |

| code | Insertion barrel length (mm). |
|---|---|
| 10 | 0 (flat flange). |
| 11 | 50 |
| 12 | 100 |
| 13 | 150 |
| T | Customer specified |

| code | Mounting bracket |
|---|---|
| B0 | No mounting brackets |
| B1 | Tube bending bracket |
| B2 | Plate bending bracket |
| B3 | Flat bracket for tubes |

| code | Hazardous Location Certification |
|---|---|
| E0 | not |
| E1 | Flameproof version, explosion-proof class EXd II. CT6 |
| E2 | Intrinsically safe, explosion-proof EXia II. CT6 |

| code | Electrical connection |
|---|---|
| D1 | M20*1.5 standard |
| D2 | User specified |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DY | B | E | M1 | 22 N1 T1 | A | Y0 | X0 | 10 | B0 | E0 | D1 | Selection examples |