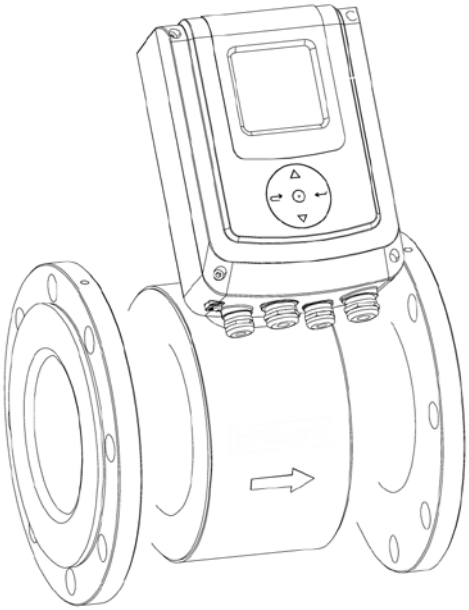
# Technical Specification
# gFlow+ IF800
# Electromagnetic Flowmeter



## Application

- Full spectrum industrial application for conductive liquid
- Robust design for noisy fluid flow measurement in various process conditions
- Food and beverage filling and batch application
- Chemical industry with high temperature media
- Mining water with particles or sludge


## Features

- Improved accuracy – 0.5% as standard and 0.2% with optional calibration
- Ideal for noisy measurement in harsh environment
- Fast response time fit for filling in food and beverage industry
- Meter diagnosis function for minimal maintenance
- Equipped with meter verification function –no offline calibration needed anymore
- 3 programmable totalizers
- OLED display to prolong operating temperature range
- Equipped up to 2x AI, 1x AO, 2x DI, 3xDO with extension I/O modules for maximum flexibility of user application
- Build in data logger with up to 2GB SD card
- Build in PID controller
- Build in mathematic functions for energy calculation or open channel flow calculation

## Flow measurement

| | |
|---|---|
| **Measured variable** | Volume flow rate by flow speed |
| **Measuring range** | 0.01~10 m/s |
| **Reverse flow measurement** | Yes |
| **Measuring performance** | 0.5% o.R. |
| | 0.2%/0.3% o.R. up on request for special calibration |
| **Response time** | **Time to 95% measurement value** |
| | <500mS |
| **Digital Input** | 1x DI on base board |
| | 1x DI on I/O board |
| | **Logic 1** |
| | Open contact |
| | **Logic 0** |
| | Closed contact |
| | **Galvanic isolation** |
| | 500V DC |
| **Analog Input** | **4~20mA** |
| | Active/Passive selectable |
| | **0~5V** |
| | 24bit ADC input |
| | **Galvanic isolation** |
| | 500 V DC |

## Output

| | |
|---|---|
| **Digital output** | 1x DO on main board |
| | 2x DO on I/O board |
| | All digital output channels are configurable to pulse, frequency or status outputs |
| | **Pulse output** |
| | Active/Passive switchable |
| | Up to 10000 pulse per second |
| | **Frequency output** |
| | Active/Passive switchable |
| | 0~10kHz, 50% duty cycle |
| **Analog output** | 1x active or passive selectable 4~20mA output on I/O board |
| | Max. load resistance: 750ohm |
| **Relay output** | 1x NO and 1x NC on I/O board, 220V AC Max. 1A |
| **Communication** | **Standard** |
| | Modbus RS-485 interface |
| | Supporting MODBUS function codes: 03, 04, 06, 16 |
| | Galvanic isolation 500V DC |
| | **Optional with extension I/O card** |
| | HART |
| **Auxiliary Power supply** | 24VDC Max. 100mA unregulated for external use |

## Power supply

| | |
|---|---|
| **Supply voltage** | 85~265 VAC or 24VDC |
| **Power consumption** | 20W |

## Materials

| | |
|---|---|
| **Flowtube** | 304 stainless steel |
| **Sensor Liner** | **Selectable from** |
| | Chloroprene Rubber |
| | Nature Rubber |
| | Poly Urethane |
| | Perfluoroalkoxy (PFA) |
| | Ploytetrafluorothylene (PTFE) |
| | Fluorinated ethylene propylene (FEP) |
| **Sensor Electrodes** | **Selectable from** |
| | 316L stainless steel |
| | Platinum |
| | Hastelloy B alloy |
| | Tantalum |
| | Titanium |
| | Hastelloy C alloy |
| | Tungsten carbonized |
| **Sensor Housing** | **Selectable from** |
| | Stainless steel |
| | Carbon steel |
| **Connection flanges** | **Selectable from** |
| | Stainless steel |
| | Carbon steel |
| **Terminal housing** | Casted aluminum alloy, powder coated |
| **Electronics Housing** | Casted aluminum alloy, powder coated |
| **Housing screws** | Stainless Steel |
| **Sensor finish** | **Carbon steel version** |
| | Anticorrosion epoxy multi layer paint |
| | **Stainless steel version** |
| | Sand blasted finish |

## Process

| | | |
|---|---|---|
| **Temperature** | 0~180°C | |
| **Pressure rating** | DN10~DN80 (1/4″~3″) | 40bar (4.0MPa) |
| | DN100~DN150 (4″~6″) | 16bar (1.6MPa) |
| | DN200~DN1000 (8″~40″) | 10bar (1.0MPa) |
| | DN1100~DN1600 (44″~64″) | 6bar (0.6MPa) |
| | DN1800~DN3000 (72″~120″) | 2.5bar (0.25MPa) |
| | **High pressure rating as per request** | |
| **Min. Conductivity** | 5 µS/cm | |

| | |
|---|---|
| **Connection** | **Selectable as standard from**<br>ANSI B16.5 #150, #300, #600, #900<br>DIN PN10, PN16, PN25, PN40<br>JIS 10K, 20K, 40K<br>BS4054 PN6, PN10, PN16, PN25, PN40<br>**Other flanges upon request** |

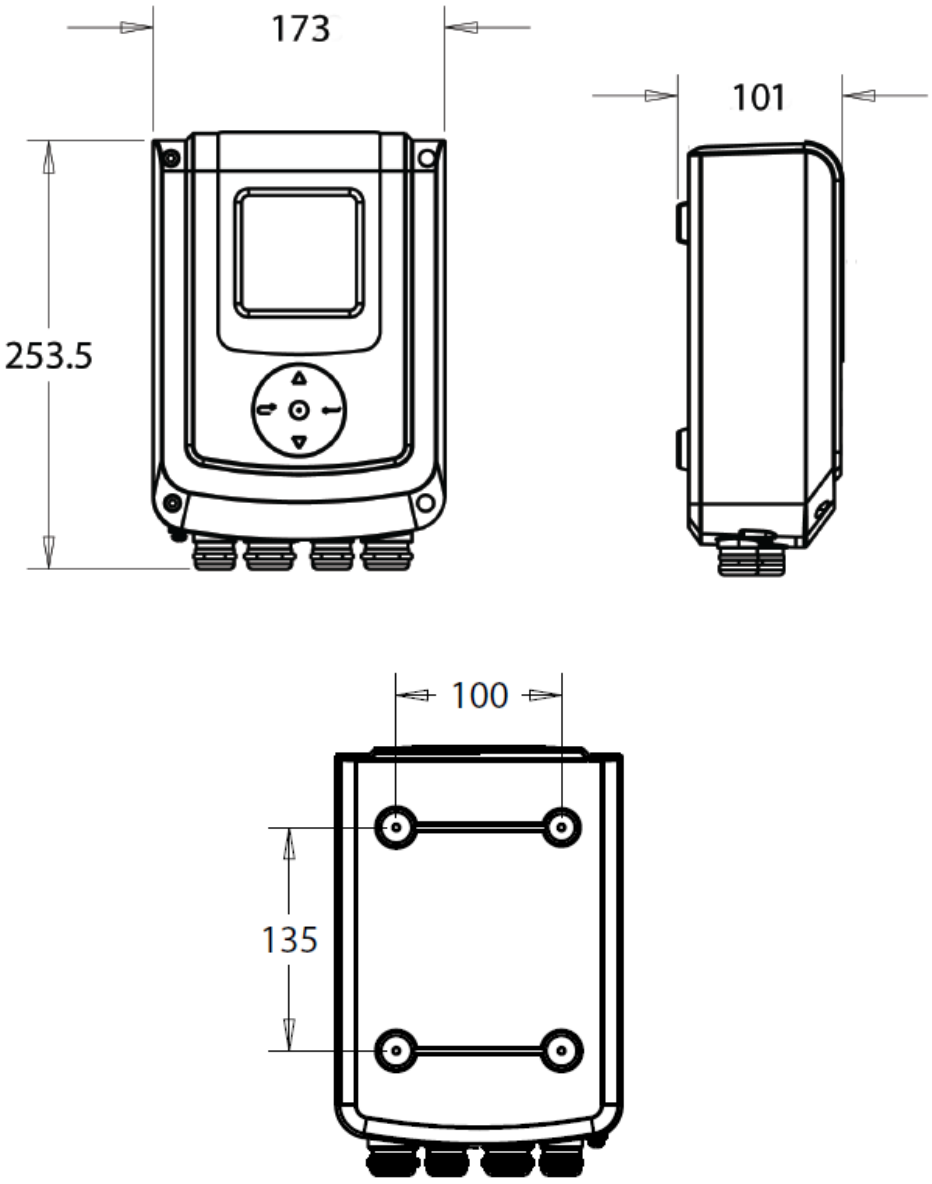
## Environment

| | |
|---|---|
| **Ambient temperature** | **Operation temperature**<br>-40~85°C |
| **CE Marking** | IEC61000-4-2, 6kV direct discharge, 8kV discharge<br>IEC 61000-4-3, 80MHz~1000MHz 10V/m,1000MHz ~ 2700MHz:3V/m<br>IEC 61000-4-4 1kV on cable<br>IEC 61000-4-5, 1kV on cable,1,2/50s wave<br>IEC 61000-4-6, 0.15~80MHz 3V<br>IEC 61000-4-8, 10A/m<br>CISPR 11RF emission |
| **Shocking condition** | IEC60068-2-27 30g 3-axis shock |
| **Protection** | **Sensor**<br>IP67, IP68 optional<br>**Transmitter**<br>IP67 |

## Diagnosis and functions

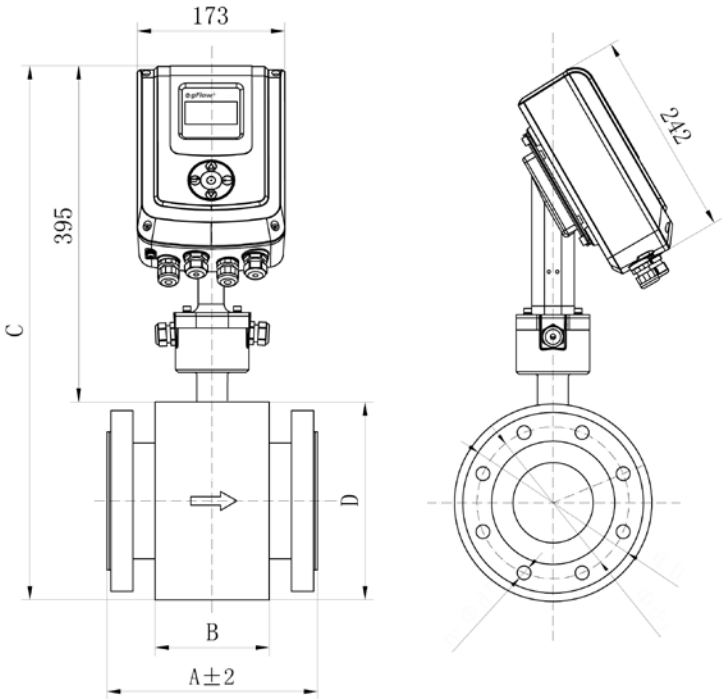
| | |
|---|---|
| **Empty pipe detection** | Yes |
| **Media resistance measurement** | Yes |
| **Coil resistance measurement** | Yes |
| **Coil temperature measurement** | Yes |
| **Excitation current measurement** | Yes |
| **Excitation voltage measurement** | Yes |
| **Configurable totalizer** | 3 |
| **User security** | 3 level password protection |
| **Build in data logger** | Yes (optional) |
| **Factory calibration data restoration** | Yes |
| **Sensor verification** | Yes (optional) |
| **Pressure detection** | Yes(optional) |

## Installation dimension

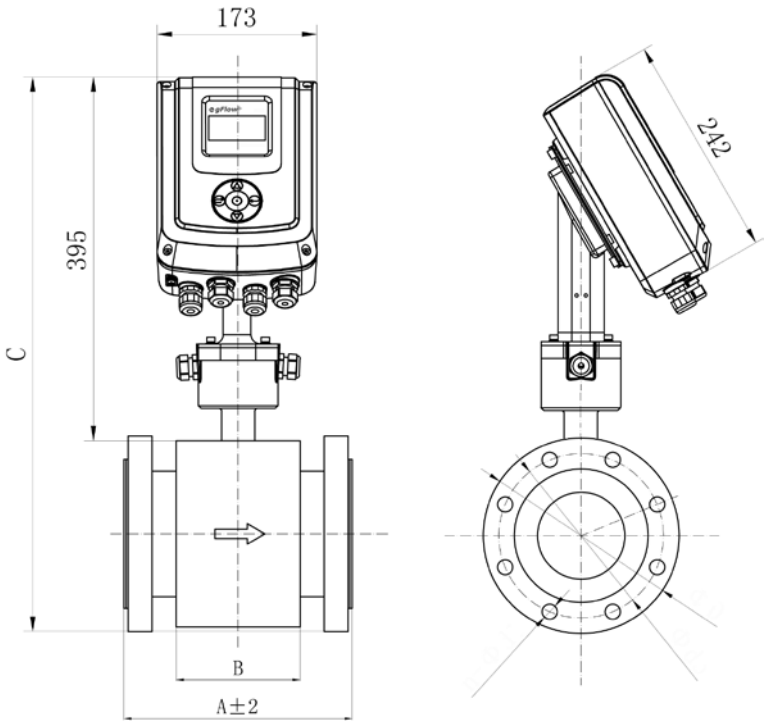



**Unit: mm** **Mounting Hole:** M4 thread x4

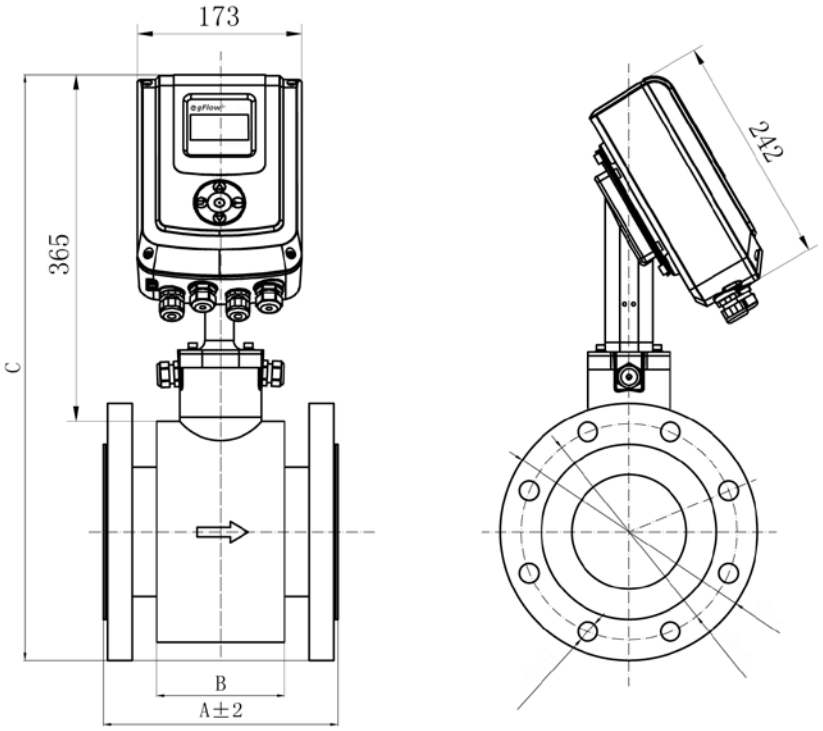
**Sensor with integrated transmitter**



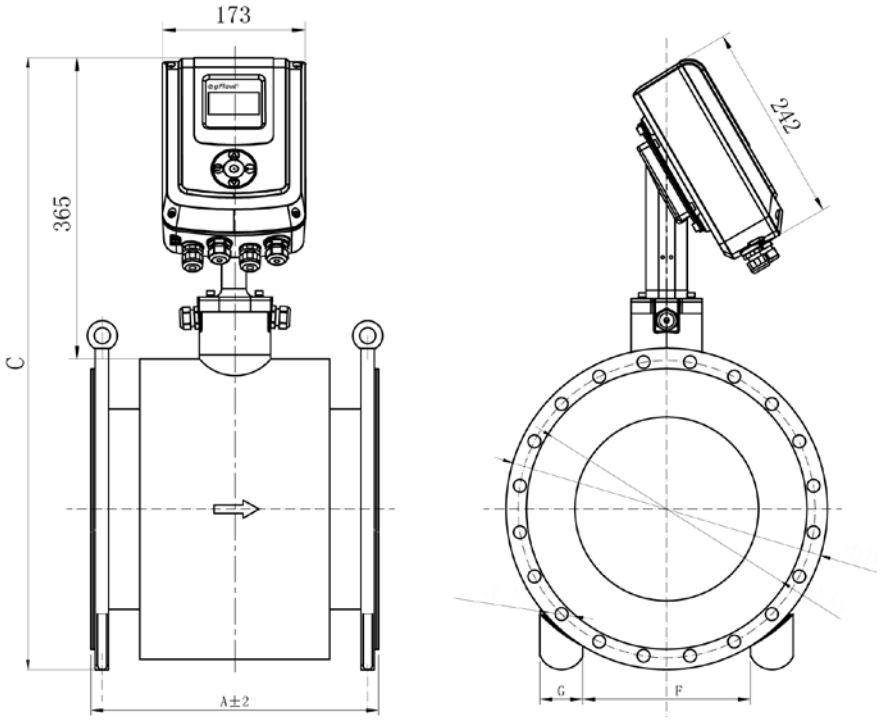

| DN | Inch | B(mm) | A±2(mm) | C(mm) | D(mm) |
|---|---|---|---|---|---|
| 10 | 3/8 | 68 | 150 | 525 | 110 |
| 15 | 1/2 | | | | |
| 20 | 3/4 | | | | |



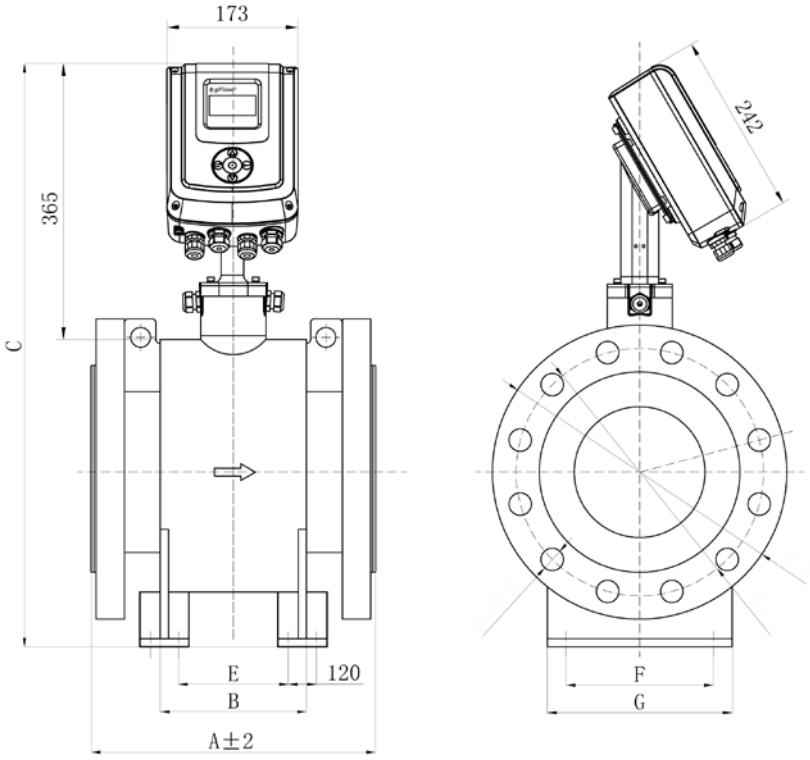

| DN | Inch | B(mm) | A±2(mm) | C(mm) |
|---|---|---|---|---|
| 25 | 1 | 66 | 150 | 559 |
| 32 | 1 1/4 | | | 576 |
| 40 | 1 1/2 | | | 586 |
| 50 | 2 | 102 | 200 | 563 |
| 65 | 2 1/2 | | | 582 |




| DN | Inch | B(mm) | A±2(mm) | C(mm) |
|---|---|---|---|---|
| 80 | 3 | 102 | 200 | 564 |
| 100 | 4 | 122 | 250 | 576 |
| 125 | 5 | 138 | 250 | 603 |
| 150 | 6 | 176 | 300 | 637 |
| 200 | 8 | 202 | 350 | 688 |
| 250 | 10 | 222 | 400 | 740 |
| 300 | 12 | 312 | 500 | 785 |
| 350 | 14 | 312 | 500 | 845 |
| 400 | 16 | 392 | 600 | 909 |
| 450 | 18 | 402 | 600 | 959 |

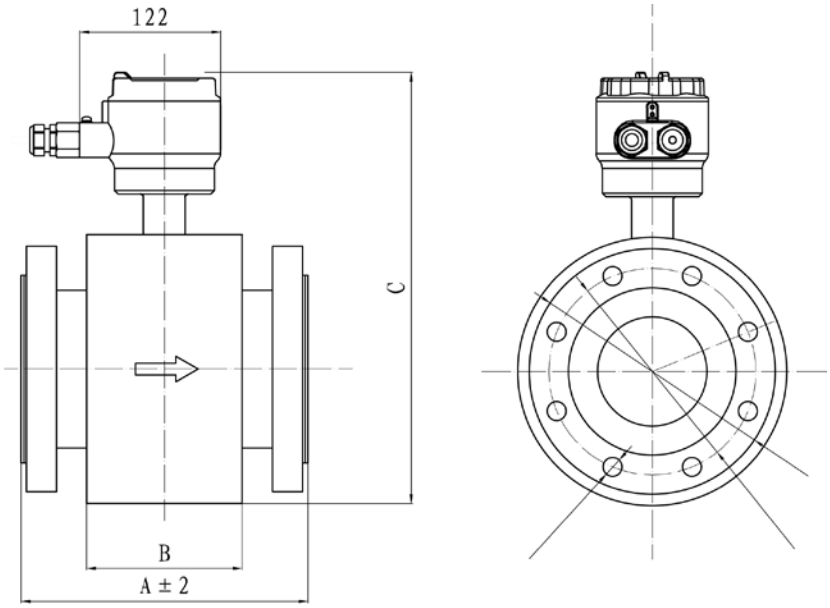



| DN | Inch | A±2(mm) | C(mm) | F(mm) | G(mm) |
|---|---|---|---|---|---|
| 500 | 20 | 600 | 1079 | 367.8 | 120 |
| 600 | 24 | 600 | 1184 | 399.4 | |
| 700 | 28 | 700 | 1299 | 436.0 | |
| 800 | 32 | 800 | 1396 | 466.2 | 150 |
| 900 | 36 | 900 | 1506 | 549.5 | |
| 1000 | 40 | 1000 | 1594 | 579.0 | |
| 1100 | 44 | 1100 | 1689 | 592.6 | |
| 1200 | 48 | 1200 | 1804 | 621.2 | |
| 1400 | 56 | 1400 | 2017 | 539.9 | |
| 1500 | 60 | 1500 | 2118 | 555.8 | |
| 1600 | 64 | 1600 | 2217 | 572.9 | |

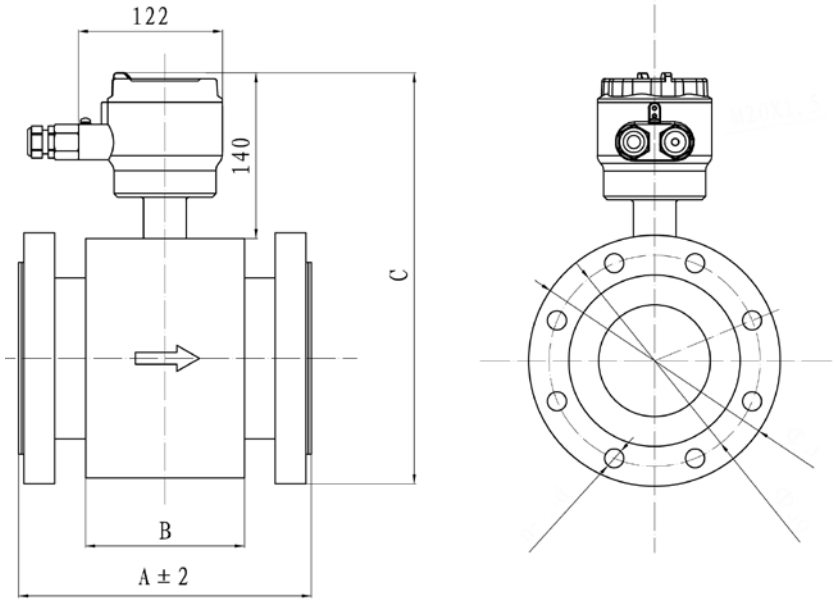



| DN | Inch | A±2(mm) | B(mm) | C(mm) | E(mm) | F(mm) | G(mm) |
|---|---|---|---|---|---|---|---|
| 1800 | 72 | 1800 | 1340 | 2488 | 1224 | 800 | 900 |
| 2000 | 80 | 2000 | 1510 | 2547 | 1382 | 1100 | 1200 |
| 2200 | 88 | 2200 | 1720 | 2757 | 1592 | | |
| 2400 | 96 | 2400 | 1872 | 2977 | 1742 | 1300 | 1400 |
| 2600 | 104 | 2600 | 2022 | 3183 | 1892 | | |
| 2800 | 112 | 2800 | 2172 | 3387 | 2042 | 1500 | 1600 |
| 3000 | 120 | 3000 | 2362 | 3593 | 2232 | | |

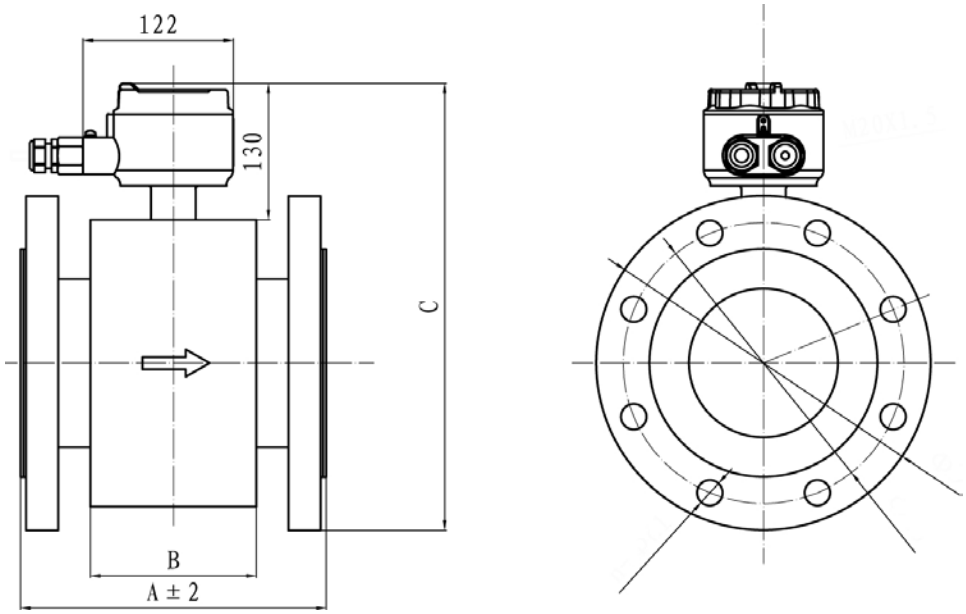
## Sensor with remote transmitter



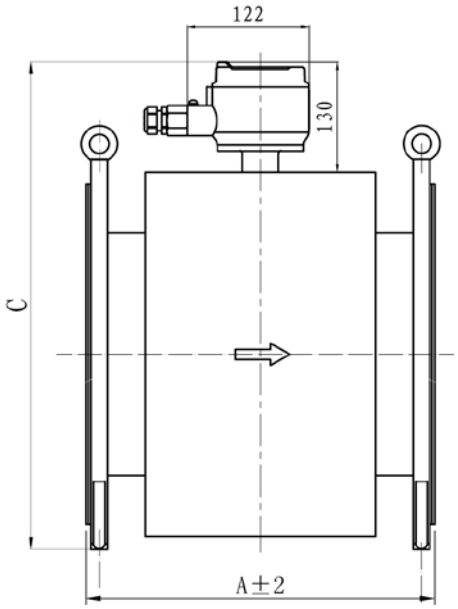

| DN | Inch | B(mm) | A±2(mm) | C(mm) |
|---|---|---|---|---|
| 10 | 3/8 | 68 | 150 | 250 |
| 15 | 1/2 | | | |
| 20 | 3/4 | | | |
| 25 | 1 | 66 | 150 | 254 |
| 32 | 1 1/4 | | | 271 |
| 40 | 1 1/2 | | | 281 |

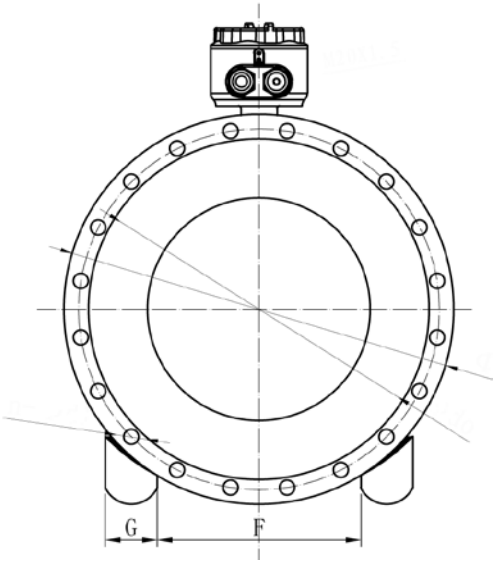



| DN | Inch | B(mm) | A±2(mm) | C(mm) |
|---|---|---|---|---|
| 50 | 2 | 102 | 200 | 299 |
| 65 | 2 1/2 | | | 318 |

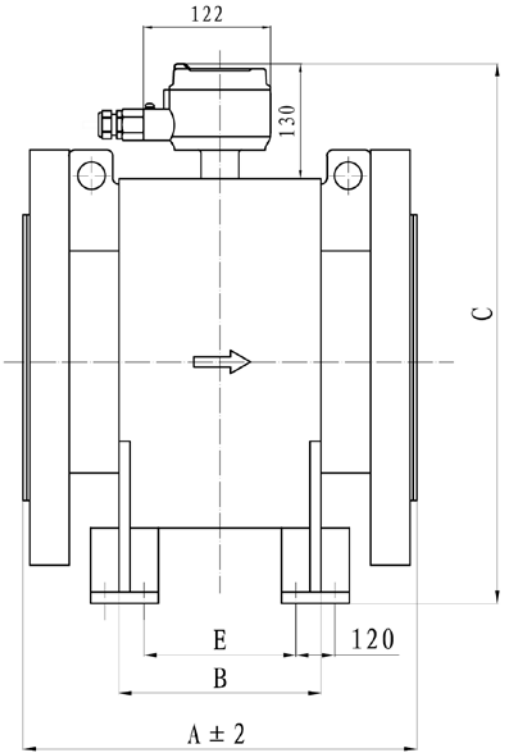


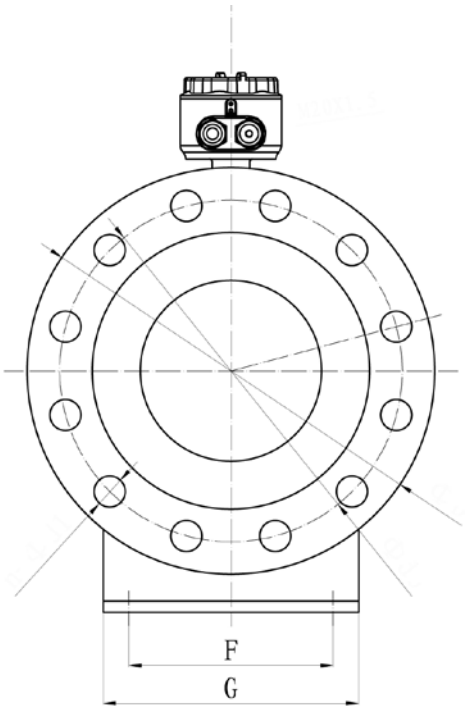

| DN | Inch | B(mm) | A±2(mm) | C(mm) |
|---|---|---|---|---|
| 80 | 3 | 102 | 200 | 320 |
| 100 | 4 | 122 | 250 | 341 |
| 125 | 5 | 138 | 250 | 368 |
| 150 | 6 | 176 | 300 | 402 |
| 200 | 8 | 202 | 350 | 453 |
| 250 | 10 | 222 | 400 | 505 |
| 300 | 12 | 312 | 500 | 560 |
| 350 | 14 | 312 | 500 | 610 |
| 400 | 16 | 392 | 600 | 674 |
| 450 | 18 | 402 | 600 | 724 |



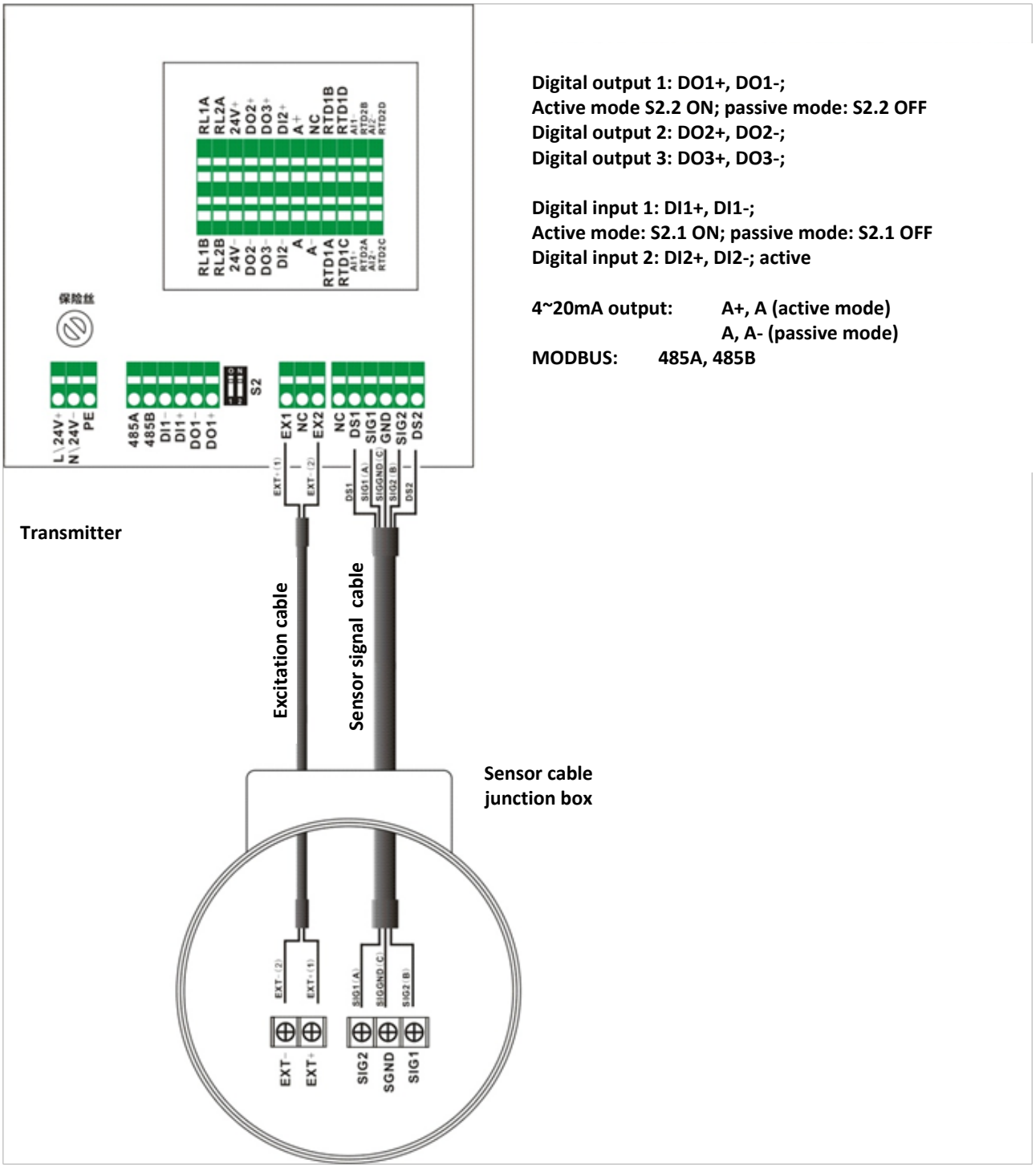

| DN | Inch | A±2(mm) | C(mm) | F(mm) | G(mm) |
|---|---|---|---|---|---|
| 500 | 20 | 600 | 844 | 367.8 | 120 |
| 600 | 24 | 600 | 949 | 399.4 | |
| 700 | 28 | 700 | 1064 | 436.0 | |
| 800 | 32 | 800 | 1161 | 466.2 | 150 |
| 900 | 36 | 900 | 1271 | 549.5 | |
| 1000 | 40 | 1000 | 1359 | 579.0 | |
| 1100 | 44 | 1100 | 1463 | 592.6 | |
| 1200 | 48 | 1200 | 1569 | 621.2 | |
| 1400 | 56 | 1400 | 1782 | 539.9 | |
| 1500 | 60 | 1500 | 1883 | 555.8 | |
| 1600 | 64 | 1600 | 1982 | 572.9 | |




| DN | Inch | A±2(mm) | B(mm) | C(mm) | E(mm) | F(mm) | G(mm) |
|---|---|---|---|---|---|---|---|
| 1800 | 72 | 1800 | 1340 | 2253 | 1224 | 800 | 900 |
| 2000 | 80 | 2000 | 1510 | 2469 | 1382 | 1100 | 1200 |
| 2200 | 88 | 2200 | 1720 | 2679 | 1592 | | |
| 2400 | 96 | 2400 | 1872 | 2899 | 1742 | 1300 | 1400 |
| 2600 | 104 | 2600 | 2022 | 3105 | 1892 | | |
| 2800 | 114 | 2800 | 2172 | 3309 | 2042 | 1500 | 1600 |
| 3000 | 120 | 3000 | 2362 | 3515 | 2232 | | |

## Wiring diagram



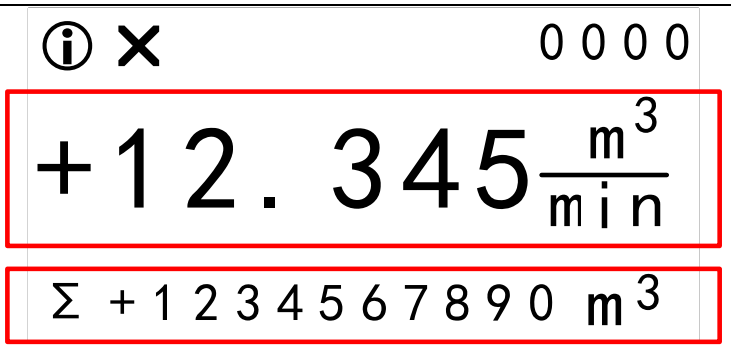
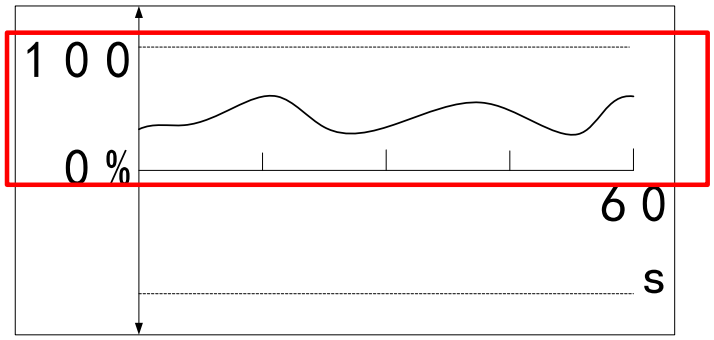
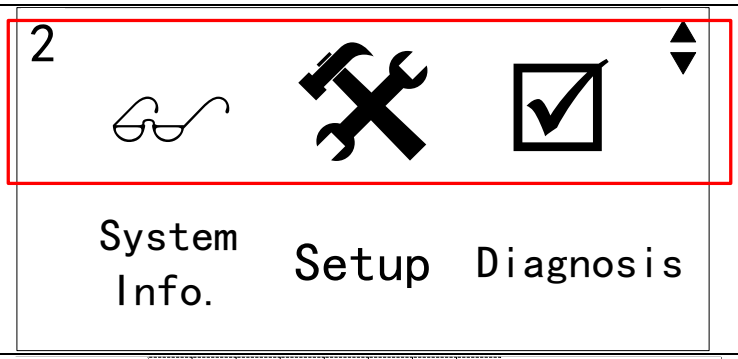
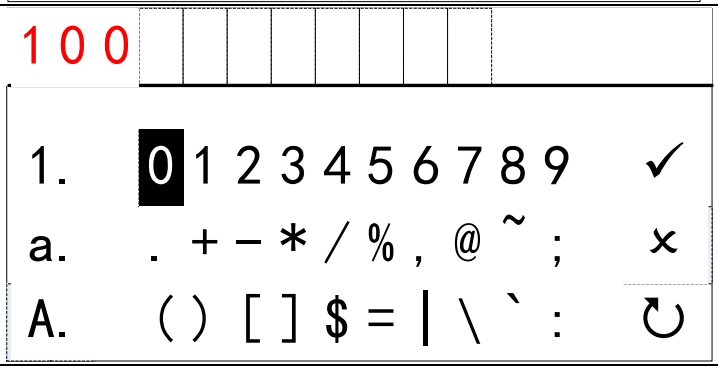

**Digital output 1: DO1+, DO1-;**
**Active mode S2.2 ON; passive mode: S2.2 OFF**
**Digital output 2: DO2+, DO2-;**
**Digital output 3: DO3+, DO3-;**

**Digital input 1: DI1+, DI1-;**
**Active mode: S2.1 ON; passive mode: S2.1 OFF**
**Digital input 2: DI2+, DI2-; active**

**4~20mA output: A+, A (active mode)**
**A, A- (passive mode)**
**MODBUS: 485A, 485B**

| Terminal | Description |
|---|---|
| DS1/2 | Signal shield |
| SIG1/2 | Sensor electrode signal |
| GND | Sensor ground |
| EX1/2 | Excitation terminal |
| DO1+/- | Digital output #1 signal/ground |
| DI1+/- | Digital input #1 signal/ground |
| 485A/B | RS-485 communication terminal |
| RL1A/B | NO relay terminals |
| RL2A/B | NC relay terminals |
| 24V+ | Auxiliary 24V power supply positive |
| 24V- | Auxiliary 24V power supply ground |
| DO2+/- | Digital output #2 signal/ground |
| DO3+/- | Digital output #3 signal/ground |
| DI2+/- | Digital input #2 signal/ground |
| A+/A | Active 4~20mA output terminals |
| A/A- | Passive 4~20mA output terminals |
| AI1+/- | Analog Input #1 |
| AI2+/- | Analog Input #2 |
| NO | Not in use |

## Highlights of GUI

| | |
|---|---|
| Simple and informative main screen to show both flow rate and flow total , error and warning sign shown on upper left screen. |  |
| Display historical flow rate data from SD data card up to 2GB |  |
| Maximum graphical menu design for intuitive operation, integrated help line, no more paper manual needed. |  |
| Soft keypad for full qwerty text input |  |

| IF800 | - | AAA | -BB | C | -DD | E | F | -G | H | I | J | -KK | LL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Model**

IF800-

| AAA | Size | |
|---|---|---|
| 308 | DN10 | 3/8" |
| 102 | DN15 | 1/2" |
| 304 | DN20 | 3/4" |
| 001 | DN25 | 1" |
| 114 | DN32 | 1 1/4" |
| 112 | DN40 | 1 1/2" |
| 002 | DN50 | 2" |
| 212 | DN65 | 2 1/2" |
| 003 | DN80 | 3" |
| … | … | … |
| 120 | DN3000 | 120 |
| xxx | Special size | |

| BB | Electrodes material |
|---|---|
| 10 | 316L stainless steel |
| 11 | Platinum |
| 12 | Hastelloy B alloy |
| 13 | Tantalum |
| 14 | Titanium |
| 15 | Hastelloy C alloy |
| 16 | Tungsten carbonized |

| C | Liner material |
|---|---|
| 2 | PFA |
| 3 | Chloroprene Rubber |
| 4 | Poly Urethane |
| 5 | PTFE |
| 6 | FEP |
| 7 | Nature Rubber |

| DD | Process connection |
|---|---|
| A1 | ANSI 150# flange |
| A2 | ANSI 300# flange |
| A3 | ANSI 600# flange |
| A4 | ANSI 900# flange |
| D1 | DIN PN10 flange |
| D2 | DIN PN16 flange |
| D3 | DIN PN25 flange |
| D4 | DIN PN40 flange |
| J1 | JIS 10K flange |
| J2 | JIS 20K flange |
| J3 | JIS 40K flange |
| B1 | BS4054 PN6 flange |
| B2 | BS4054 PN10 flange |

| IF800 | - | AAA | -BBB | C | -DD | E | F | -G | H | I | J | -KK | LL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| B3 | BS4054 PN16 flange |
| B4 | BS4054 PN 25 flange |
| B5 | BS4054 PN 40 flange |
| O | Special Order |

| E | Process temperature |
|---|---|
| L | Low temperature (-35~0°C) |
| E | Normal temperature (0~60°C) |
| H | High temperature (60~180°C) |

| F | Calibration Accuracy |
|---|---|
| 2 | 0.002 |
| 3 | 0.003 |
| 5 | 0.005 |

| G | Grounding rings |
|---|---|
| 0 | None |
| 1 | Have |

| H | Protection |
|---|---|
| 0 | IP67 |
| 1 | IP68 |

| I | Transmitter type |
|---|---|
| 0 | Compact |
| 1 | Remote |

| J | Communication |
|---|---|
| 1 | RS-485 |
| 2 | HART |

| KK | Sensor housing and flange |
|---|---|
| 00 | Carbon steel |
| 01 | 316L Stainless steel |
| 11 | 304 Stainless steel |

| LL | Power supply |
|---|---|
| 00 | 85~265 VAC |
| 01 | 24V DC |