



Recorder



Flow



Pressure



Temp



Analyzer



Level

# Datasheet

## Electromagnetic Flowmeter

### LGD-SUP-A100

# Supmea

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**Datasheet****Electromagnetic flow meter  
LGD-SUP-A100**

The electromagnetic flow meter is designed based on the Faraday electromagnetic induction principle and are used to directly measure the flow rate of conductive liquids in closed pipelines. During on-site monitoring and display, standard current signals, pulse signals, and RS485 digital signals can be output for recording, adjustment, and control, achieving automatic detection and control. It can be widely used in industries such as tap water, chemical industry, coal, environmental protection, light textile, metallurgy, paper making, etc.

**Applications**

- Tap water
- Chemical industry
- Coal
- Environmental protection
- Light textile
- Reservoirs

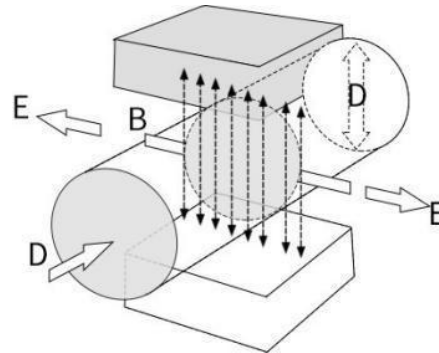
**Features**

- 0.5%F.S measuring accuracy
- RS-485 modbus communication, 4-20mA output
- It can measure the flow of fluid in the forward and reverse directions.
- Unaffected by the temperature, pressure, density of the liquid.
- There is no pressure loss.
- Readings that are unaffected by changes in density or viscosity.
- The grounding screws are available by default

**Electromagnetic flowmeter**

## Principle

The operating principle of electromagnetic flowmeter is based on Faraday's law of electromagnetic induction. The two electromagnetic coils at the upper and lower ends as shown in Figure 3 generate a constant or alternating magnetic field. When the conductive medium flows through the electromagnetic flowmeter, the induced electromotive force can be detected between the left and right electrodes on the wall of the flowmeter tube. The magnitude of the induced electromotive force is proportional to the electrically conductive medium flow rate, the magnetic induction density of the magnetic field, and the width of the conductor (the inner diameter of the flowmeter measuring tube), and the flow rate of the medium can be obtained by calculation. The induced electromotive force equation is as follows:



$$E = K \times B \times V \times D$$

Where: E — Induced electromotive force K —

Meter constant

B — Magnetic induction density

V — Average flow speed in cross-section of measuring tube D —

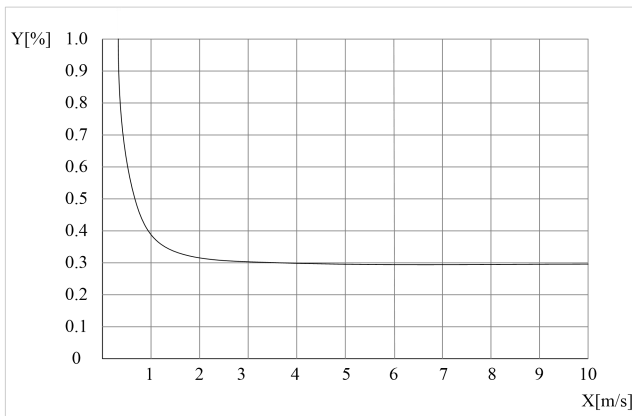
Inner diameter of measuring tube

Fig.1

When measuring the flow, the fluid flows through a magnetic field which is perpendicular to the flow direction. The flow of conductive fluid induces a potential proportional to the average flow velocity, thus requiring the conductivity of the measured flowing liquid to be higher than the minimum conductivity. The induced voltage signal is detected by two electrodes and transmitted to the converter via a cable. After a series of analog and digital signal processing, the accumulated flow and real-time flow are displayed on the display of the converter.

## Technical Parameters

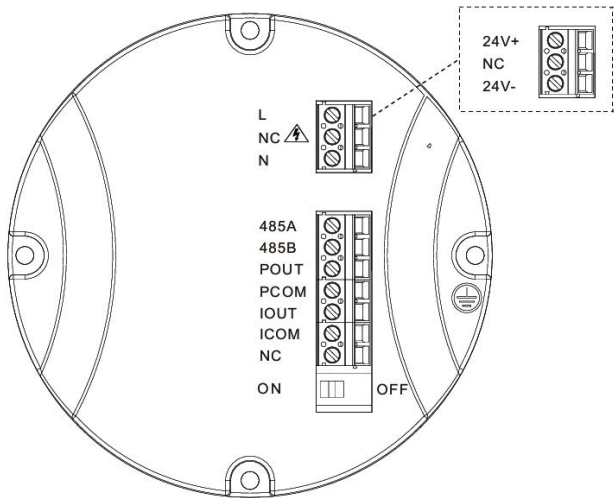
| Input             |                                                                                                       |                                                                        |                  |
|-------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|
| Measured variable | Direct measured variables : Flow velocity<br>Calculated measured variables : Volume flow , mass flow. |                                                                        |                  |
| Velocity of flow  | Typically Velocity of flow: 0.5m/s~5m/s                                                               |                                                                        |                  |
| Nominal diameter  | DN10~DN1000                                                                                           |                                                                        |                  |
| Flow range        | Nominal diameter                                                                                      | Min value (m³/h)                                                       | Max value (m³/h) |
|                   | DN10                                                                                                  | 0.14                                                                   | 1.4              |
|                   | DN15                                                                                                  | 0.32                                                                   | 3.2              |
|                   | DN20                                                                                                  | 0.56                                                                   | 5.6              |
|                   | DN25                                                                                                  | 0.88                                                                   | 8.8              |
|                   | DN32                                                                                                  | 1.4                                                                    | 14               |
|                   | DN40                                                                                                  | 2.3                                                                    | 23               |
|                   | DN50                                                                                                  | 3.5                                                                    | 35               |
|                   | DN65                                                                                                  | 6                                                                      | 60               |
|                   | DN80                                                                                                  | 9                                                                      | 90               |
|                   | DN100                                                                                                 | 14                                                                     | 140              |
|                   | DN125                                                                                                 | 22                                                                     | 220              |
|                   | DN150                                                                                                 | 32                                                                     | 320              |
|                   | DN200                                                                                                 | 56                                                                     | 560              |
|                   | DN250                                                                                                 | 88                                                                     | 880              |
|                   | DN300                                                                                                 | 127                                                                    | 1270             |
|                   | DN350                                                                                                 | 173                                                                    | 1730             |
|                   | DN400                                                                                                 | 226                                                                    | 2260             |
|                   | DN450                                                                                                 | 286                                                                    | 2860             |
|                   | DN500                                                                                                 | 353                                                                    | 3530             |
|                   | DN600                                                                                                 | 509                                                                    | 5090             |
|                   | DN700                                                                                                 | 693                                                                    | 6930             |
|                   | DN800                                                                                                 | 905                                                                    | 9050             |
| DN900             | 1150                                                                                                  | 11500                                                                  |                  |
| DN1000            | 1410                                                                                                  | 14100                                                                  |                  |
| Range ratio       | 1:10                                                                                                  |                                                                        |                  |
| Output            |                                                                                                       |                                                                        |                  |
| Current output    | Function                                                                                              | Measurement of volume and quality<br>(in the case of constant density) |                  |
|                   | Setting                                                                                               | Scope                                                                  | (4~20)mA         |
|                   |                                                                                                       | Max                                                                    | 20mA             |
|                   |                                                                                                       | Min                                                                    | 4mA              |
|                   | Internal voltage                                                                                      | 24VDC                                                                  |                  |
|                   | Loading                                                                                               | ≤750Ω                                                                  |                  |
| Pulse output      | Function                                                                                              | Set up Pulse output                                                    |                  |

|                                |                                                                                                                                                                                 |                               |                                                                                                                                                                                          |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | Pulse output                                                                                                                                                                    | Basis                         | F <sub>max</sub> ≤ 5000 cp/s<br>Output pulse width: 0.1ms ~2000ms<br>( This value is lower than the maximum duty cycle, with a maximum duty cycle of 1:1<br>F <sub>max</sub> ≤ 5000 cp/s |
|                                |                                                                                                                                                                                 | Pulse coefficient             | 0.001~100000/unit                                                                                                                                                                        |
|                                | Passive                                                                                                                                                                         | U <sub>Outer</sub> ≤ 30VDC    |                                                                                                                                                                                          |
|                                | Active                                                                                                                                                                          | U <sub>Internal</sub> ≤ 24VDC |                                                                                                                                                                                          |
|                                |                                                                                                                                                                                 | I≤ 4.52mA                     |                                                                                                                                                                                          |
| Communications                 | RS485 serial , MODBUS-RTU communication protocol                                                                                                                                |                               |                                                                                                                                                                                          |
| Relay ( Remote type optional ) | 2 channels SPST, 250VAC/3A                                                                                                                                                      |                               |                                                                                                                                                                                          |
| Power supply                   |                                                                                                                                                                                 |                               |                                                                                                                                                                                          |
| Supply voltage                 | 100VAC~240VAC, 50/60Hz;<br>20VDC~28VDC                                                                                                                                          |                               |                                                                                                                                                                                          |
| Power consumption              | ≤15W                                                                                                                                                                            |                               |                                                                                                                                                                                          |
| Terminals                      | Screw type terminal block, maximum wire diameter 2.5mm <sup>2</sup>                                                                                                             |                               |                                                                                                                                                                                          |
| Cable entries                  | M20*1.5 Cable gland                                                                                                                                                             |                               |                                                                                                                                                                                          |
| Signal cable                   | Apply only to remote type                                                                                                                                                       |                               |                                                                                                                                                                                          |
| Performance characteristics    |                                                                                                                                                                                 |                               |                                                                                                                                                                                          |
| Reference operating conditions | Medium: water<br>Temperature: 20℃<br>Pressure: 0.1MPa<br>Stallation requirements: Inlet run≥10DN, Outlet run≥5DN                                                                |                               |                                                                                                                                                                                          |
| Accuracy                       | Measurement value±0.5%(Flow velocity 0.5m/s~5m/s)                                                                                                                               |                               |                                                                                                                                                                                          |
| Repetitiveness                 | 0.16%                                                                                                                                                                           |                               |                                                                                                                                                                                          |
| Maximum measured error         | <div></div> <div>①X[m/s]: Velocity of flow<br/>②Y[%]: Actual measured value deviation</div> |                               |                                                                                                                                                                                          |

| Process                                              |                                                                                                                                                                                                 |                                                                                                                                          |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Medium temperature range                             | Chloroprene rubber (CR): -10℃~70℃<br>Polyurethane rubber (UR): -10℃~60℃<br>PTFE/FEP: -10℃~120℃<br>PFA: -10℃~120℃                                                                                |                                                                                                                                          |
| Pressure rating<br>(High pressure can be customized) | DN10~DN250: PN<1.6MPa<br>DN300~DN1000: PN<1.0MPa<br>Note: (If there are differences in the selection of individual specifications, the label shall prevail, and high-voltage can be customized) |                                                                                                                                          |
| Conductivity                                         | ≥50μS/cm                                                                                                                                                                                        |                                                                                                                                          |
| Buried depth                                         | Not deeper than 5 meters<br>(only for remote type sensors with IP68 protection)                                                                                                                 |                                                                                                                                          |
| Immersion depth                                      | Not deeper than 3 meters<br>(only for remote type sensors with IP68 protection)                                                                                                                 |                                                                                                                                          |
| Environment                                          |                                                                                                                                                                                                 |                                                                                                                                          |
| Ambient temperature                                  | Integrated type: -10℃~55℃<br>Remote type: -20℃~60℃                                                                                                                                              |                                                                                                                                          |
| Storage temperature                                  | -20℃~55℃                                                                                                                                                                                        |                                                                                                                                          |
| Ingress protection                                   | Integrated type                                                                                                                                                                                 | IP65                                                                                                                                     |
|                                                      |                                                                                                                                                                                                 | IP66/IP67<br>（Cable requirements: Choose armored shielded cable, core: diagonal 2 * 2 * 0.75 or 1.5 * 2/2.5 * 2; wire diameter 8mm~12mm） |
|                                                      | Remote type                                                                                                                                                                                     | Sensor: IP65<br>Converter: IP68                                                                                                          |

Wiring

Wiring terminals  
Integrated type



Terminal schematic diagram

Table 1 Terminal Description

| Terminal                                                                            | Description                               |
|-------------------------------------------------------------------------------------|-------------------------------------------|
| L, N                                                                                | 220V AC power supply                      |
| 24V+, 24V-                                                                          | 24V DC power supply                       |
| 485A, 485B                                                                          | RS485 serial communication                |
| IOUT, ICOM                                                                          | (4~20)mA output                           |
| POUT, PCOM                                                                          | Pulse output                              |
|  | Converter instrument protection grounding |

Remote type

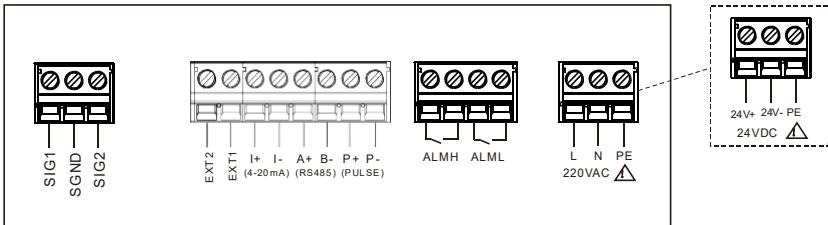
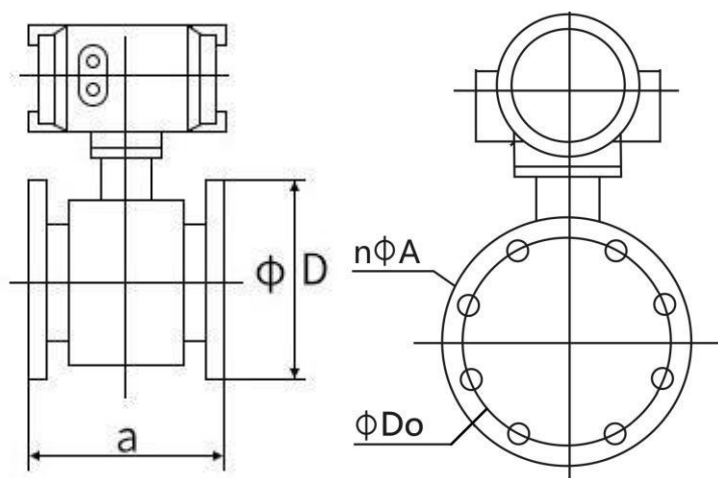


Fig.2 Terminal schematic diagram

Table 2 Terminal Description

| Terminal       | Description                |
|----------------|----------------------------|
| SIG1、SIG2、SGND | Sensor signal              |
| EXT1、EXT2      | Excitation signal          |
| I+、I-          | (4~20)mA output            |
| A+、B-          | RS485 serial communication |
| P+、P-          | Pulse output               |
| ALMH、ALML      | Relay output (Optional)    |
| L, N           | 220V AC power supply       |
| 24V+, 24V-     | 24V DC power supply        |
| PE             | Ground                     |

**Dimension**


Sensor appearance diagram  
Sensor dimensions

| DN   | a    | D    | Do   | n*A   | Pressure resistance |
|------|------|------|------|-------|---------------------|
| 10   | 200  | 90   | 60   | 4*14  | 1.6MPa              |
| 15   | 200  | 95   | 65   | 4*14  | 1.6MPa              |
| 20   | 200  | 105  | 75   | 4*14  | 1.6MPa              |
| 25   | 200  | 115  | 85   | 4*14  | 1.6MPa              |
| 32   | 200  | 135  | 100  | 4*18  | 1.6MPa              |
| 40   | 200  | 145  | 110  | 4*18  | 1.6MPa              |
| 50   | 200  | 160  | 125  | 4*18  | 1.6MPa              |
| 65   | 200  | 180  | 145  | 4*18  | 1.6MPa              |
| 80   | 200  | 195  | 160  | 8*18  | 1.6MPa              |
| 100  | 250  | 215  | 180  | 8*18  | 1.6MPa              |
| 125  | 250  | 245  | 210  | 8*18  | 1.6MPa              |
| 150  | 300  | 280  | 240  | 8*23  | 1.6MPa              |
| 200  | 350  | 335  | 295  | 12*23 | 1.6MPa              |
| 250  | 450  | 405  | 355  | 12*25 | 1.6MPa              |
| 300  | 500  | 440  | 400  | 12*23 | 1.0MPa              |
| 350  | 550  | 500  | 460  | 16*23 | 1.0MPa              |
| 400  | 600  | 565  | 515  | 16*25 | 1.0MPa              |
| 450  | 600  | 615  | 565  | 20*25 | 1.0MPa              |
| 500  | 600  | 670  | 620  | 20*25 | 1.0MPa              |
| 600  | 600  | 780  | 725  | 20*30 | 1.0MPa              |
| 700  | 700  | 895  | 840  | 24*30 | 1.0MPa              |
| 800  | 800  | 1015 | 950  | 24*33 | 1.0MPa              |
| 900  | 900  | 1115 | 1050 | 28*33 | 1.0MPa              |
| 1000 | 1000 | 1230 | 1160 | 28*36 | 1.0MPa              |

## Installation

### ■ Installation

(1) Installation direction

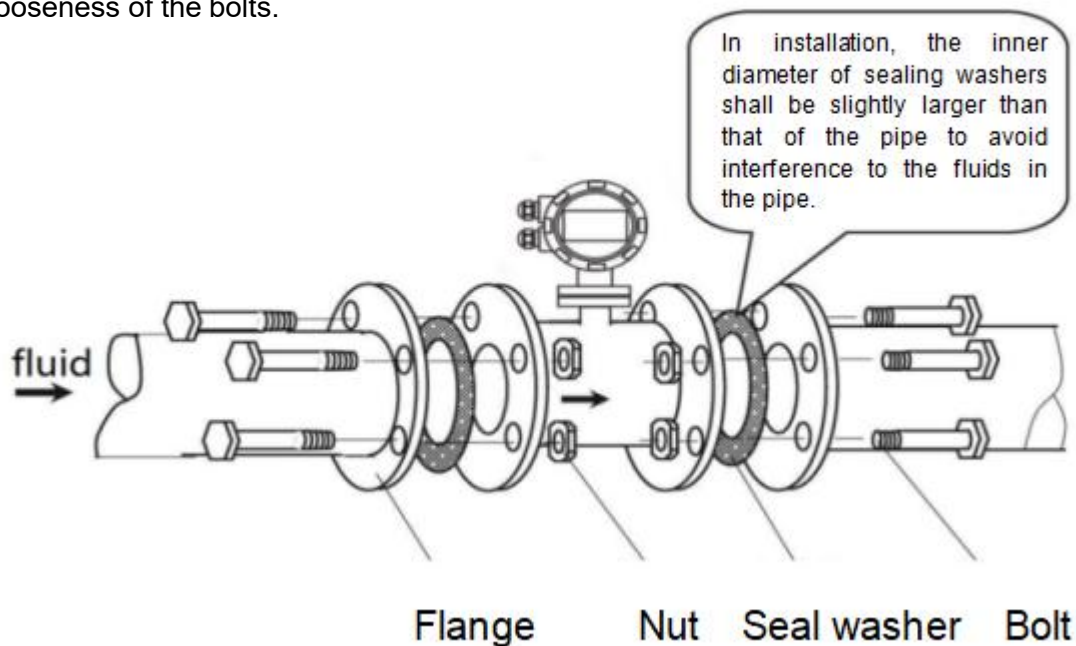
The flow direction of the measured fluid shall be consistent with flow direction mark indicated on the flowmeter.

(2) Seal gaskets installed between flanges shall have good corrosion resistance and shall not protrude into the interior of the pipe.

(3) When welding or flame cutting is performed adjacent to sensor pipe, isolation measures shall be taken to prevent the lining from being deformed due to heat.

(4) If it is installed in a well or immersed in water, apply sealant on the terminal box of the sensor after the system is installed and debugged. (If the protection level of the electromagnetic flowmeter is IP68 at type selection, it has been subject to water-proof sealing.)

(5) When the flowmeter is installed on the field, use bolts to connect the flange on the sensor to that on the pipe. Bolts, nuts and their threads for securing meters shall be complete and free of damage and well lubricated. Use them with suitable flat washers and spring washer. A torque wrench shall be used to tighten the bolts according to the flange size and torque. Regularly tighten the bolts during daily use to prevent looseness of the bolts.



## Ordering code

| SUP-A100           |    |  |  |  |  |  |  |  |  |  | Description       |
|--------------------|----|--|--|--|--|--|--|--|--|--|-------------------|
| Nominal diameter   | 10 |  |  |  |  |  |  |  |  |  | DN10(3/8")        |
|                    | 15 |  |  |  |  |  |  |  |  |  | DN15(1/2")        |
|                    | 20 |  |  |  |  |  |  |  |  |  | DN20(3/4")        |
|                    | 25 |  |  |  |  |  |  |  |  |  | DN25(1")          |
|                    | 32 |  |  |  |  |  |  |  |  |  | DN32(1.25")       |
|                    | 40 |  |  |  |  |  |  |  |  |  | DN40(1.5")        |
|                    | 50 |  |  |  |  |  |  |  |  |  | DN50(2")          |
|                    | 65 |  |  |  |  |  |  |  |  |  | DN65(2.5")        |
|                    | 80 |  |  |  |  |  |  |  |  |  | DN80(3")          |
|                    | 1C |  |  |  |  |  |  |  |  |  | DN100(4")         |
|                    | 1E |  |  |  |  |  |  |  |  |  | DN125(5")         |
|                    | 1G |  |  |  |  |  |  |  |  |  | DN150(6")         |
|                    | 2C |  |  |  |  |  |  |  |  |  | DN200(8")         |
|                    | 2G |  |  |  |  |  |  |  |  |  | DN250(10")        |
|                    | 3C |  |  |  |  |  |  |  |  |  | DN300(12")        |
|                    | 3G |  |  |  |  |  |  |  |  |  | DN350(14")        |
|                    | 4C |  |  |  |  |  |  |  |  |  | DN400(16")        |
|                    | 4G |  |  |  |  |  |  |  |  |  | DN450(18")        |
|                    | 5C |  |  |  |  |  |  |  |  |  | DN500(20")        |
|                    | 6C |  |  |  |  |  |  |  |  |  | DN600(24")        |
|                    | 7C |  |  |  |  |  |  |  |  |  | DN700(28")        |
|                    | 8C |  |  |  |  |  |  |  |  |  | DN800(32")        |
|                    | 9C |  |  |  |  |  |  |  |  |  | DN900(36")        |
|                    | A0 |  |  |  |  |  |  |  |  |  | DN1000(40")       |
| Process connection | J  |  |  |  |  |  |  |  |  |  | JB/T 81 Flange    |
|                    | D  |  |  |  |  |  |  |  |  |  | GB/T9124 Flange   |
|                    | L  |  |  |  |  |  |  |  |  |  | EN 1092-1 Flange  |
|                    | G  |  |  |  |  |  |  |  |  |  | Clamp             |
|                    | I  |  |  |  |  |  |  |  |  |  | ISO2852 Clamp     |
|                    | C  |  |  |  |  |  |  |  |  |  | ASME B16.5 Flange |
|                    | S  |  |  |  |  |  |  |  |  |  | JIS B2220 Flange  |
|                    | X  |  |  |  |  |  |  |  |  |  | Others            |
| Nominal pressure   | A  |  |  |  |  |  |  |  |  |  | PN6               |
|                    | B  |  |  |  |  |  |  |  |  |  | PN10              |
|                    | C  |  |  |  |  |  |  |  |  |  | PN16              |
|                    | D  |  |  |  |  |  |  |  |  |  | PN25              |
|                    | E  |  |  |  |  |  |  |  |  |  | PN40              |
|                    | F  |  |  |  |  |  |  |  |  |  | PN63              |
|                    | J  |  |  |  |  |  |  |  |  |  | JIS 10K           |
|                    | G  |  |  |  |  |  |  |  |  |  | Class 150         |

|                                                              |   |    |    |    |    |  |  |  |  |  |                                                               |
|--------------------------------------------------------------|---|----|----|----|----|--|--|--|--|--|---------------------------------------------------------------|
|                                                              | X |    |    |    |    |  |  |  |  |  | Other                                                         |
| Process connection material<br>and body material             |   | MC |    |    |    |  |  |  |  |  | Carbon steel                                                  |
|                                                              |   | M1 |    |    |    |  |  |  |  |  | 304SS                                                         |
|                                                              |   | XX |    |    |    |  |  |  |  |  | Others                                                        |
| Accuracy                                                     |   |    | K  |    |    |  |  |  |  |  | 0.5 Class                                                     |
| Output and power supply                                      |   |    | AA |    |    |  |  |  |  |  | 4-20mA+pulse+RS485, 220VAC                                    |
|                                                              |   |    | AM |    |    |  |  |  |  |  | 4-20mA+pulse+RS485, 24VDC                                     |
|                                                              |   |    | AE |    |    |  |  |  |  |  | 4-20mA+HART+pulse+RS485, 220VAC                               |
|                                                              |   |    | AN |    |    |  |  |  |  |  | 4-20mA+HART+pulse+RS485, 24VDC                                |
|                                                              |   |    | AC |    |    |  |  |  |  |  | Pulse+4-20mA+RS485+SPST, 220VAC                               |
|                                                              |   |    | AP |    |    |  |  |  |  |  | Pulse+4-20mA+RS485+SPST, 24VDC                                |
|                                                              |   |    | CE |    |    |  |  |  |  |  | Pulse+4-20mA+HART+RS485+SPST, 220VAC                          |
|                                                              |   |    | CF |    |    |  |  |  |  |  | Pulse+4-20mA+HART+RS485+SPST, 24VDC                           |
| Electrode material                                           |   |    | M3 |    |    |  |  |  |  |  | 316LSS                                                        |
|                                                              |   |    | MF |    |    |  |  |  |  |  | Hastelloy B                                                   |
|                                                              |   |    | MG |    |    |  |  |  |  |  | Hastelloy C                                                   |
|                                                              |   |    | T1 |    |    |  |  |  |  |  | Ti                                                            |
|                                                              |   |    | T2 |    |    |  |  |  |  |  | Ta                                                            |
|                                                              |   |    | MH |    |    |  |  |  |  |  | Platinum Iridium Alloy PT                                     |
|                                                              |   |    | MJ |    |    |  |  |  |  |  | WC                                                            |
| Lining material                                              |   |    |    | N6 |    |  |  |  |  |  | PTFE                                                          |
|                                                              |   |    |    | N1 |    |  |  |  |  |  | CR                                                            |
|                                                              |   |    |    | N2 |    |  |  |  |  |  | PU                                                            |
|                                                              |   |    |    | N7 |    |  |  |  |  |  | Teflon F46/FEP                                                |
| Electrical interface, Housing material, and protection level |   |    |    |    | WA |  |  |  |  |  | Integrated Type, M20×1.5 Cable Gland, Aluminum Alloy, IP65    |
|                                                              |   |    |    |    | W5 |  |  |  |  |  | Integrated Type, M20×1.5 Cable Gland, Aluminum Alloy, IP66/67 |
|                                                              |   |    |    |    | WC |  |  |  |  |  | Remote Type, M20×1.5 Cable                                    |

|                                  |    |   |    |  |                                   |
|----------------------------------|----|---|----|--|-----------------------------------|
|                                  |    |   |    |  | Gland, Aluminum Alloy, IP68       |
| Cable length for the remote type | 00 |   |    |  | 0m                                |
|                                  | 10 |   |    |  | 10m                               |
|                                  | 15 |   |    |  | 15m                               |
|                                  | 20 |   |    |  | 20m                               |
|                                  | 25 |   |    |  | 25m                               |
|                                  | 30 |   |    |  | 30m                               |
|                                  | XX |   |    |  | Others                            |
| Language                         | 1  |   |    |  | Chinese                           |
|                                  | 2  |   |    |  | English                           |
|                                  | 3  |   |    |  | Russian                           |
|                                  | 4  |   |    |  | Spanish                           |
|                                  | 5  |   |    |  | Korean                            |
|                                  | X  |   |    |  | Others                            |
| Additional certification         |    | 0 |    |  | None                              |
|                                  |    | C |    |  | CCEP                              |
|                                  |    | U |    |  | UL                                |
|                                  |    | N |    |  | NSF                               |
| Accessories                      |    |   | PB |  | Paired with Carbon Steel Flange   |
|                                  |    |   | PC |  | Paired with 304SS Flange          |
|                                  |    |   | PE |  | Paired with SS316L Grounding Ring |