# bar LG200-FRF

LG200 integrated temperature transmitter adopts ASIC&SMT signal transmitting module, optional built-in backlight and button operation LCD display module. The integrated transient voltage terminal satisfy 4 grade standard (difference-mode voltage 2000V, common-mode voltage 4000V), suitable for bad surge voltage occasions.

LG200 integrated temperature transmitter provides a flexible and reliable solution for any temperature measurement applications.

Horizontal installation with tri-clamp

Vertical installation with thread

MICROSENSOR
AUTHORIZED DISTRIBUTOR

## SPECIFICATIONS

| Main parameters | |
|---|---|
| Measuring range | -50 - 400°C |
| Output signal | 4-20mA |
| Reference accuracy | ±0.5% URL |
| **Field of application** | Temperature measurement |
| **Measuring medium** | The fluid which compatible with wetted parts |
| **Measuring range and limit** | -50-400°C, min measuring range 100°C |
| | The unit of the measuring range above can be converted into °F or K. Provide other measuring range according to requirements. Adjust requirements: lower range value (LRV) and upper range value (URV) can be adjusted within the scope of the upper and lower range limit, minimum measuring range≤| URV - LRV |≤maximum measuring range |
| **Standard specifications and reference conditions** | Test standard: GB/T30121 / IEC60751; Zero based- calibration span, 4-20mA analog output |
| **Performance specifications** | The overall performance including but not limited to [ reference accuracy ], [environment temperature effects]and other comprehensive error |
| | Typical accuracy: ±0.5%URL |
| | Stability: superior to ±0.05% URL or 0.1°C/year, whichever is greater@ under the checking condition |
| **Ambient temperature effects (reference accuracy: 22°C)** | ≤ ±0.005% URL/°C, temperature 22°C |

| | |
|---|---|
| **Reference accuracy** | Including linearity, hysteresis and repeatability. calibration temperature: 20°C ± 5°C |
| | Linear output accuracy<br>Typical<br>±0.5% URL<br>Full scale |
| **Power supply effects** | ≤±0.01% URL/V, power supply 24V(refer to full scale output 20mA) |
| **Loading effects** | ≤±0.02% URL/100Ω(refer to full scale output 20mA) |
| **Vibration effects** | According to IEC60068-2-6 , 4g/2...100HZ |
| **Output signal** | |
| Signal | 4-20mA |
| Type | Linearity |
| Output | Two wire |
| **Insulation resistance** | ≥20M Ω@ reference, 100VDC |
| **Power supply** | |
| Power consumption | ≤500mW@24VDC, 20.8mA |
| **Damping time** | Total damping time constant: equal to the sum of damping time of amplifier and sensor capsule |
| | Reaction time: ≤10s@ water flow 0.4m/s, outer diameter: 6mm |

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Disclaimer: all the data used in the product description is not legally binding. Relevant technical details may be changed due to further improve

## ENVIRONMENT CONDITION

| Items | Operational condition |
|---|---|
| Working temperature | -40-85°C, integrated LCD display: -20-70°C |
| Storage temperature | -40-100°C, integrated LCD display: -20-70°C |
| Working humidity | 0-95%RH |
| Protection class | Stainless steel housing with aviation plug, IP67 |

## REACTION TIME(TEST STANDARD: IEC60751, 10S@ WATER FLOW 0.4M/S)

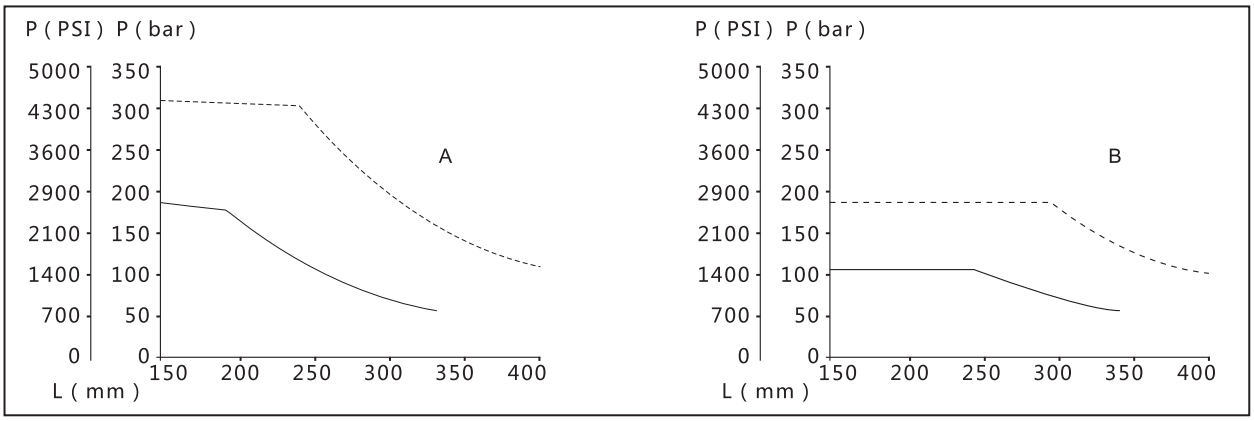
| Thermal protection tube | | | | |
|---|---|---|---|---|
| **Outer diameter** | **Reaction time** | **Reducing pipe 5.3mm** | **Cone-shaped tube 6.6mm or 9mm** | **Straight tube** |
| 10mm(wall thickness 1 mm) | t50<br>t90 | 7.5s<br>21s | 11s<br>37s | 18s<br>55s |
| 12mm(wall thickness 1 mm) | t50<br>t90 | 7.5s<br>21s | -<br>- | 18s<br>55s |
| 16mm(wall thickness 1 mm) | t50<br>t90 | -<br>- | 11s<br>37s | 38s<br>125s |

**Note:** The reaction time above do not include the reaction time of temperature transmitter.

## ENVIRONMENT CONDITION

| | |
|---|---|
| Mounting direction | None |
| Mounting position | Pipe, tube or others |
| Insertion length* | The smallest insertion length should 8 times outer diameter of thermal protection tube, and the end of the probe should reach or surpass the pivot of the tube. |
| *Please consider technique data and process connection parameters(such as medium flow rate, process pressure and so on) before confirm the insertion length of the transmitter. | |

**Process pressure (The process pressure dured by thermal protection tube changes along with medium temperature, see chart below)**




| | | | |
|---|---|---|---|
| ——— Tube diameter 10mm | tube wall thickness 1mm | A: water, T=50℃ | L: immersion depth |
| - - - - - - - - - - Tube diameter 12mm | tube wall thickness 2mm | B: superheated steam, T=400℃ | P: process pressure |

Disclaimer: all the data used in the product description is not legally binding. Relevant technical details may be changed due to further improve

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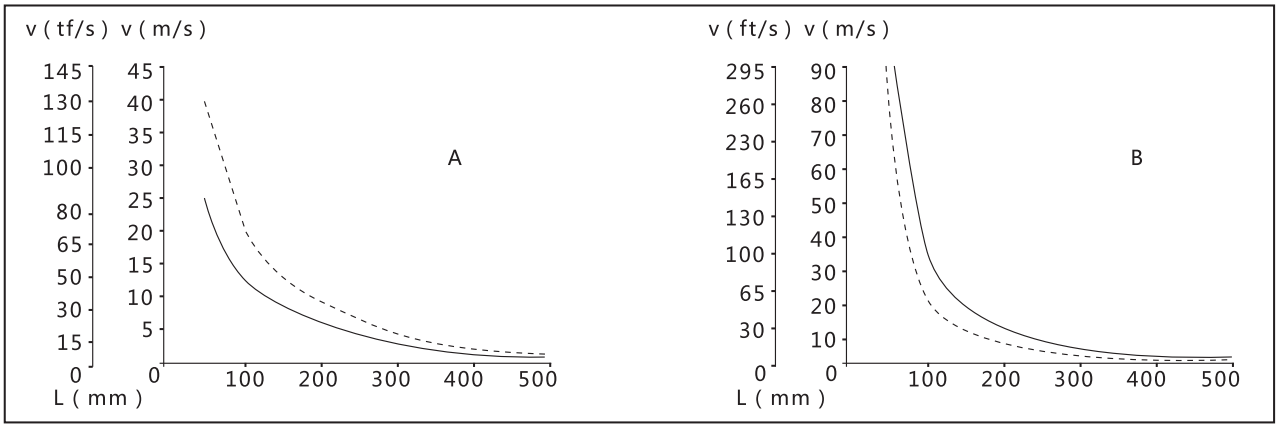
**Process pressure (The process pressure dured by thermal protection tube changes along with medium temperature, see chart below)**




| | | | |
|---|---|---|---|
| ——— Tube diameter 10mm | tube wall thickness 1mm | A: water, T=50℃ | L: immersion depth |
| - - - - - - - - - - - Tube diameter 12mm | tube wall thickness 2mm | B: superheated steam, T=400℃ | V: flow rate |

## EMC ENVIRONMENT(NOT RS485 SIGNAL OUTPUT)

| NO. | Test items | Basic standards | Test conditions | Performance level |
|---|---|---|---|---|
| 1 | Radiated interference | GB/T 9254/CISPR22 | 30MHz-1000MHz | OK |
| 2 | Conducted interference (DC power port) | GB/T 9254/CISPR22 | 0.15MHz-30MHz | OK |
| 3 | Electrostatic discharge immunity test (ESD) | GB/T 17626.2/IEC61000-4-2 | 4kV(Contact ),8kV(Air) | B(Note2) |
| 4 | Immunity to radio frequency EM-fields | GB/T 17626.3/IEC61000-4-3 | 10V/m(80MHz-1GHz) | A(Note1) |
| 5 | Power frequency magnetic field Immunity test | GB/T 17626.8/IEC61000-4-8 | 30A/m | A(Note1) |
| 6 | Electrical fast transient / Burst Immunity Test | GB/T 17626.4/IEC61000-4-4 | 2kV(5/50ns,100kHz) | B(Note2) |
| 7 | Surge immunity requirements | GB/T 17626.5/IEC61000-4-5 | 1kV(Line to line)<br>2kV(Line to ground) (1.2us/50us) | B(Note2) |
| 8 | Immunity to conducted disturbances induced by radio frequency fields | GB/T 17626.6/IEC61000-4-6 | 3V(150kHz-80MHz) | A(Note1) |

(Note 1)Performance level A: The performance within the limits of normal technical specifications.
(Note 2)Performance level B: Temporary reduction or loss of functionality or performance, it can restore itself. The actual operating conditions, storage and data will not be changed.

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## PRODUCT SELECTION INSTRUCTION

### Pressure sensor types

| Code | Nominal value | Description |
|---|---|---|
| R1 | Sensor types | PT100 RTD |

### Transmission module

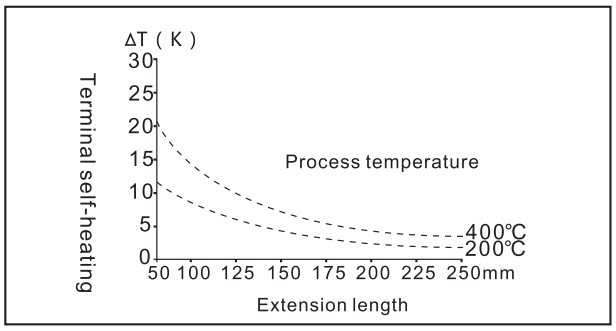
| Code | Items | Description |
|---|---|---|
| F | Output signal | 4-20mA two wire, power supply: 10-30VDC |
| C | Display | With LCD display |
| A | | Without display |

### Display module (C)

### Extension tube selection

| Code | Items | Description |
|---|---|---|
| Q1 | Specifications | None |
| Q2 | | Material: SUS316, length: 50mm, outer diameter: Φ12 |
| Q3 | | Material: SUS316, length: 100mm, outer diameter: Φ12 |
| Q4 | | Material: SUS316, length: 150mm, outer diameter: Φ12 |
| Q5 | | Material: SUS316, length: 200mm, outer diameter: Φ12 |

### Extension tube length




The relation chart of thermal resistance terminal self-heating and process temperature

**Terminal temperature= environment temperature+ terminal self-heating**

## ELECTRICAL CONNECTION

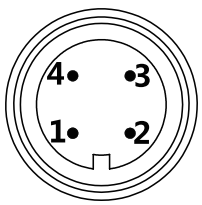
| Code | Item | Description |
|---|---|---|
| F1 | Electrical connection | Stainless steel terminal, aviation plug M12*1 (4 pin) (H2), IP67, vertical mounting |
| F2 | | Stainless steel terminal, aviation plug M12*1 (4 pin) (H2), IP67, horizontal mounting |

### Housing (F1)

### Housing (F2)

### Aviation plug, M12*1, 4 pin(H2)

### Aviation plug, M12*1, 4 pin(H2)




| Label | Two wires |
|---|---|
| 1 | Power+ |
| 2 | |
| 3 | |
| 4 | Power- |

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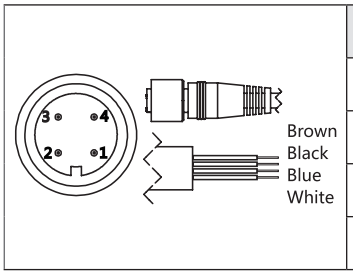
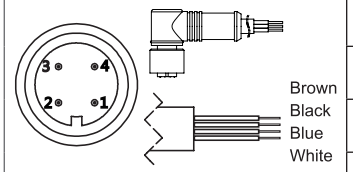
## ELECTRICAL CONNECTION ACCESSORY

### Aviation plug straighter(J1)



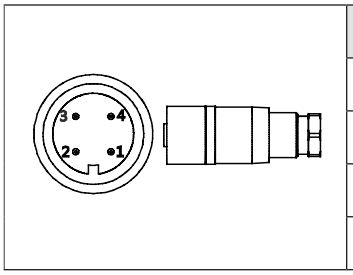

| Label | Two wires |
|---|---|
| 1/Brown | Power+ |
| 2/White | |
| 3/Blue | |
| 4/Black | Power- |

### Aviation plug elbow (J2)



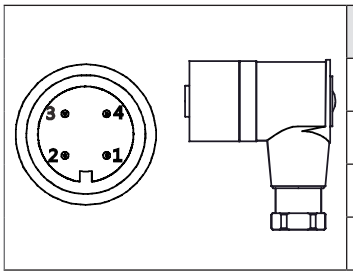

| Label | Two wires |
|---|---|
| 1/Brown | Power+ |
| 2/White | |
| 3/Blue | |
| 4/Black | Power- |

### Aviation plug straighter(J4)




| Label | Two wires |
|---|---|
| 1 | Power+ |
| 2 | |
| 3 | |
| 4 | Power - |

### Aviation plug elbow(J5)




| Label | Two wires |
|---|---|
| 1 | Power+ |
| 2 | |
| 3 | |
| 4 | Power - |

## PROCESS CONNECTION SELECT INSTRUCTION

| Code | Items | Description |
|---|---|---|
| G | Mounting type | Fixed process connection mounting |
| H | | Movable process connection mounting |
| 4 | Material | SUS304 |
| 6 | | SUS316 |
| M01 | Process connection specifications | M20*1.5(M),GB/T192-2003 |
| G01 | | G1/2(M), EN837 |
| R01 | | 1/2-14NPT(M), ANSI/ASME B1.20.1 |
| K01 | | Tri-Clamp 1-1/2" |
| K02 | | Tri-Clamp 2" |

## INSERTION PROBE SELECT INSTRUCTION

| Code | Items | Description |
|---|---|---|
| D1 | Outer diameter | Diameter: 6mm, probe material is same as process connection material |
| D2 | | Diameter: 8mm, probe material is same as process connection material |
| D3 | | Diameter: 10mm, probe material is same as process connection material |
| D4 | | Diameter: 12mm, probe material is same as process connection material |
| D5 | | Diameter: 16mm, probe material is same as process connection material |
| LXXXX | Insertion length | Customized insertion length: 0 < LXXXX< 3000mm, samples: 200mm=L0200, the minimum gap is 50mm of customized insertion length. Default insertion length includes thread specifications |

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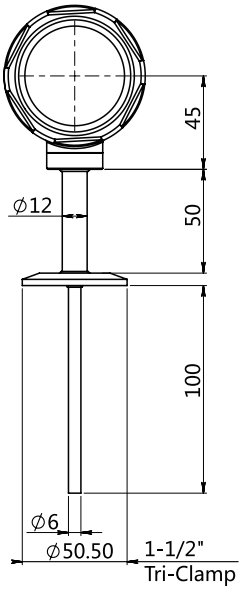
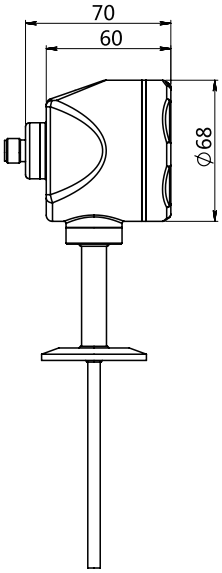
## PRODUCT DRAWING AND DIMENSION (UNIT:mm)

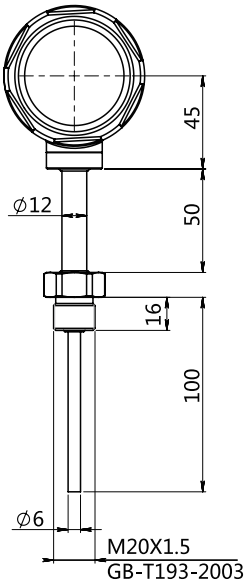
Tri-Clamp with display( C ) / without display (A ) vertical installation(F1)

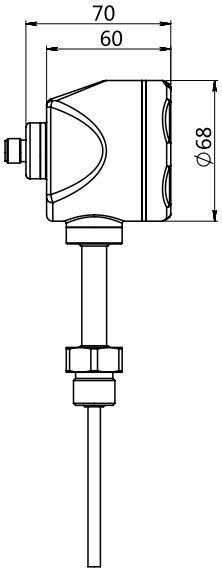



Weight: about 510g

Thread with display( C ) / without display (A ) vertical installation(F1)




Weight: about 540g

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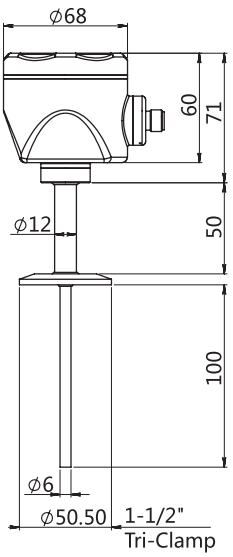
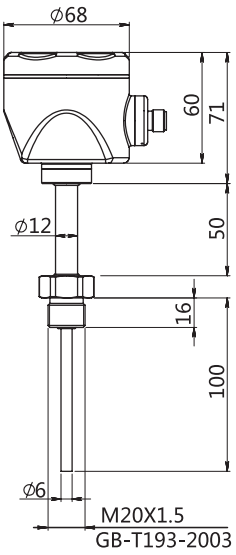
Tri-Clamp with display( C ) /
without display (A ) horizontal installation(F2)



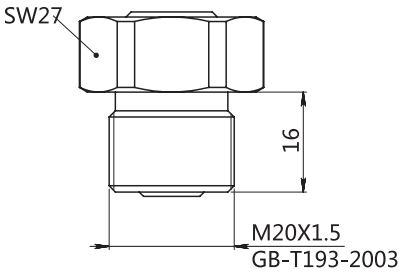

Weight: about 510g

Thread with display( C ) /
without display (A ) horizontal installation(F2)

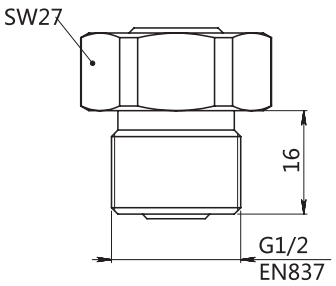



Weight: about 540g

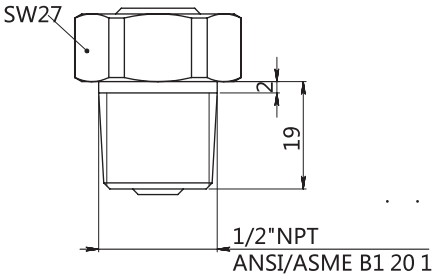
Process connection(M01)



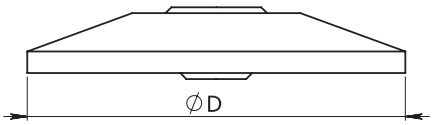

Process connection(G01)




Process connection(R01)




Process connection(K01-K02)




| Standard | Specification | Size(ΦD) |
|---|---|---|
| Tri-Clamp | 1-1/2" | 50.5 |
| Tri-Clamp | 2" | 64 |

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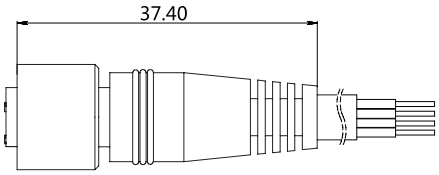
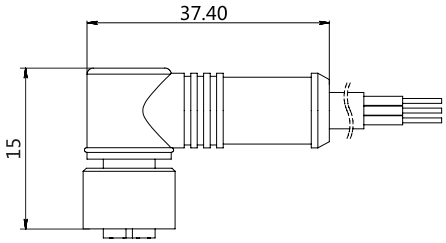
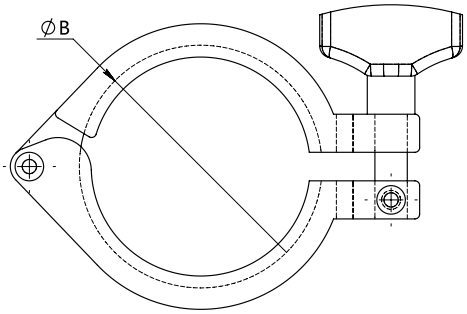
Aviation female plug straighter(J1)




Aviation female plug elbow (J2)

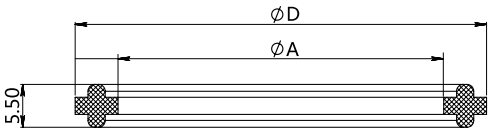



Tri-Clamp(G1-G2)



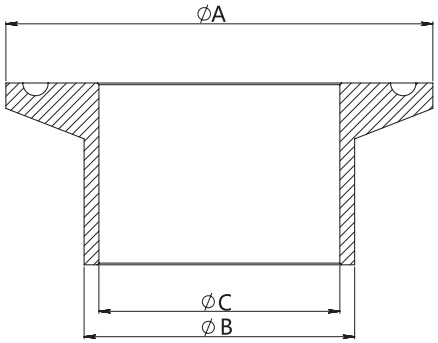

| Standard | Specification | Size(ΦB) |
|---|---|---|
| Tri-Clamp | 1-1/2" | 53.9 |
| Tri-Clamp | 2" | 67.4 |

Sealing gasket(M1-M2)




| Standard | Specification | Size(ΦD) | Size(ΦA) |
|---|---|---|---|
| Tri-Clamp | 1-1/2" | 50.5 | 35 |
| Tri-Clamp | 2" | 64 | 47.8 |

Welding adapter (Z1-Z2)




| Standard | Specification | Size(ΦA) | Size(ΦB) | Size(ΦC) |
|---|---|---|---|---|
| Tri-Clamp | 1-1/2" | 50.5 | 38 | 35.6 |
| Tri-Clamp | 2" | 64 | 51 | 48.6 |

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## ORDERING INFORMATION CHAPTER

| Item | Parameters | Code | Instruction | (*) Fast delivery available |
|---|---|---|---|---|
| | Model | LG200-FRF | Integrated thermal resistance temperature transmitter | |
| **Sensor** | **Separator** | **-** | **Detailed specifications as following** | |
| | Pressure range code | R1 | PT100 RTD | * |
| **Electrical connection** | **Separator** | **-** | **Detailed specifications as following** | |
| | Electrical connection | F1 | Stainless steel terminal, aviation plug M12*1 (4 pin) (H2), IP67, vertical mounting | * |
| | | F2 | Stainless steel terminal, aviation plug M12*1 (4 pin) (H2), IP67, horizontal mounting | * |
| | Cable entry protector | R0 | None | |
| **Output** | **Separator** | **-** | **Detailed specifications as following** | |
| | Output signal | F | 4-20mA two wire, power supply: 10-30VDC | * |
| | Display | C | With LCD display | * |
| | | A | Without display | |
| **Extension pipe** | **Separator** | **-** | **Detailed specifications as following** | |
| | Extension pipe length | Q1 | None(suitable temperature: -40°C-85°C) | |
| | | Q2 | Material: SUS316, length: 50mm, outer diameter: Φ12 | * |
| | | Q3 | Material: SUS316, length: 100mm, outer diameter: Φ12 | |
| | | Q4 | Material: SUS316, length: 150mm, outer diameter: Φ12 | |
| | | Q5 | Material: SUS316, length: 200mm, outer diameter: Φ12 | |
| **Process connection** | **Separator** | **-** | **Detailed specifications as following** | |
| | Mounting type | G | Fixed process connection mounting | * |
| | | H | Movable process connection mounting | |
| | Material | 4 | SUS304 | * |
| | | 6 | SUS316 | |
| | Specification | M01 | M20*1.5(M),GB/T192-2003 | * |
| | | G01 | G1/2(M), EN837 | * |
| | | R01 | 1/2-14NPT(M), ANSI/ASME B1.20.1 | * |
| | | K01 | Tri-Clamp 1-1/2" | * |
| | | K02 | Tri-Clamp 2" | * |
| Insertion probe | Separator | - | Detailed specifications as following | |
| | Outer diameter | D1 | Diameter: 6mm, probe material is same as process connection material | * |
| | | D2 | Diameter: 8mm, probe material is same as process connection material | * |
| | | D3 | Diameter: 10mm, probe material is same as process connection material | * |
| | | D4 | Diameter: 12mm, probe material is same as process connection material | |
| | | D5 | Diameter: 16mm, material: SUS304 | |
| | Insertion length | LXXXX | Customized insertion length: 0 < LXXXX< 3000mm, samples: 80mm=L0080, 150mm=L0150 | |

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| Additional options | Separator | - | Detailed specifications as following | |
|---|---|---|---|---|
| | Electrical connection accessory | /J1 | Aviation female plug (straighter) with 2m cable, 4 pin, M12*1, IP67 | |
| | | /J2 | Aviation female plug (elbow) with 2m cable, 4 pin, M12*1, IP67 | |
| | | /J4 | Aviation female plug (straighter) without able, 4 pin, M12*1, IP67 | * |
| | | /J5 | Aviation female plug (elbow) without cable, 4 pin, M12*1, IP67 | |
| | Process connection accessory | /G1 | 1.5" tri-clamp | * |
| | | /G2 | 2" tri-clamp | |
| | | /M1 | 1.5" sealing gasket, silicone rubber, process temperature: -60-200°C | * |
| | | /M2 | 2" sealing gasket, silicone rubber, process temperature: -60-200°C | |
| | | /Z1 | Welding adapter, Tri-Clamp1-1/2" | * |
| | | /Z2 | Welding adapter, Tri-Clamp2" | |
| | Calibration report | /Q1 | Calibration report provided by our company | |
| | Wetted parts treatment | /G1 | Ungrease treatment | |

## FACTORY SETTINGS AND PARAMETERS

| Item | Menu mark | Factory setting value |
|---|---|---|
| Tag position | None | 0(No specific settings) |
| Analog output type | mA | Liner (No specific settings) |
| Display mode | DISP | PV(No specific settings) |
| Alarm signal | ALARM | No(No specific settings) |

| Item | Menu mark | Factory setting value |
|---|---|---|
| Damping value | DAMP | 0(No specific settings) |
| 4mA Lower range value | LRV | According to the order |
| 20mA Upper range value | URV | According to the order |
| Process unit | U | According to the order |

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The information provided herein is to the best of our knowledge true and accurate, it is provided for guidance only. All specifications are subject to change without prior notification.

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