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# Golden Rules Co.,Ltd

고성능 스마트형

## 일반형KC-8200T
## 방폭형LG200
## 온도전송기


The nation's development item, 100% domestic goods,Patent **NO.** 10-1606497

## Product introduction

## Description

KC-8200 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. This integrated temperature transmitter provides a flexible and reliable solution for any temperature measurement applications.

General Model : KC-8200
Ex-proof Model : LG200

### Main parameters

| | |
|---|---|
| Measuring range | -50 - 400℃ |
| Output signal | 4-20mA, 4-20mA+HART, 1-5VDC, Modbus-RTU/RS485 |
| Reference accuracy | ±0.5% URL |

### Field of application

Temperature measurement

### Measuring medium

The fluid which compatible with wetted parts

## Technical Specifications

### Measuring range and limit

| |
|---|
| -50-400℃, min measuring range 100℃ |
| Above measurement range can be replaced by ℉ or K units. 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, smallest calibratable span≤ \| URV-LRV \| ≤ upper range limit. |

### 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℃/year, whichever is greater@ under the checking condition |

### Reference accuracy

| Including linearity, hysteresis and repeatability. calibration temperature: 20℃ ± 5℃ | | | |
|---|---|---|---|
| Linear output accuracy | Typical | ±0.5% URL | Full scale |

### Ambient temperature effects(reference accuracy: 22℃)

| |
|---|
| ≤±0.005% URL/℃, temperature 22℃ |

### 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 | Type | Output |
|---|---|---|
| 4-20mA | Linearity | Two wire |
| 4-20mA+HART | Linearity | Two wire |
| 1-5VDC | Linearity | Three wire |
| Modbus-RTU/RS485 | Linearity | Four wire |

### Insulation resistance

| |
|---|
| ≥20M Ω@ reference, 100VDC |

### Power supply

| Items | Operating conditions |
|---|---|
| Standard | 10-30VDC |
| Power consumption | ≤500mW@24VDC, 20.8mA |

### Damping time

| |
|---|
| Total damping time constant: equal to the sum of damping time of amplifer and sensor capsule |
| Reaction time: ≤10s@ water flow 0.4m/s, outer diameter: 6mm |

## Technical Specifications

### Environment condition

| Items | Operational condition |
|---|---|
| Working temperature | -40-85℃, integrated LCD display: -20-70℃ |
| Storage temperature | -40-100℃, integrated LCD display: -20-70℃ |
| Working humidity | 0-95%RH |
| Proction class | Aluminum-alloy terminal, IP67 |

### Reaction time(Test standard: IEC60751, ≤10s@ water flow 0.4m/s)

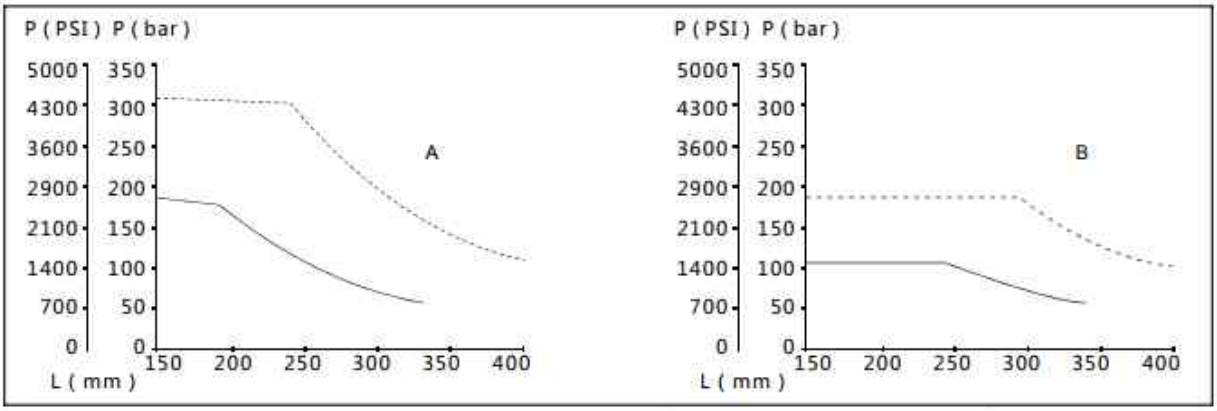
| Thermal protection tube | | | | |
|---|---|---|---|---|
| Outer diameter | Reaction time | Reducing pipe 5.3mm | Cone-shaped tube 6.6mm or 9mm | Straight tube |
| 10mm(wall thickness 1 mm) | t50<br>t90 | 7.5s<br>21s | 11s<br>37s | 18s<br>55s |
| 12mm(wall thickness 1 mm) | t50<br>t90 | 7.5s<br>21s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

Note: The reaction time above don't include the reaction time of temperature transmitter.

### Mounting requirements

| | |
|---|---|
| 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 datas and process connection parameters(such as medium flow rate、process pressure and so on) before confirm the insertion length of the transmitter. | |

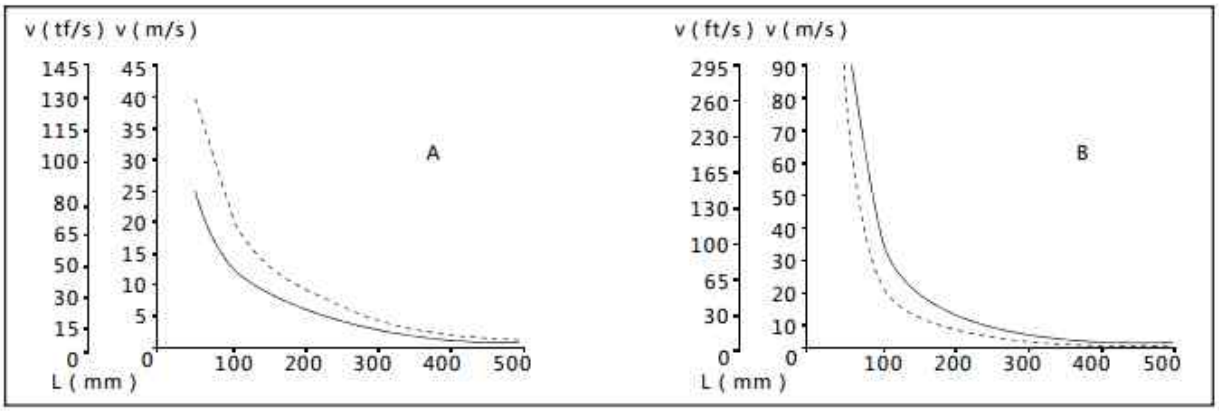
### Process pressure(The process pressure beared by thermal protection tube changes along with medium temperature, see chart below )




| | | | |
|---|---|---|---|
| ——— 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 |

## Technical Specifications

### Maximun medium flow rate(The maximun medium flow rate beared by thermal protection tube reduces with insertion length increases, 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)<br>(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 preformance within the limits of normal technical specifications.
(Note 2)Performance level B: Temporary reduction or loss of functionality or preformance, it can restore itself. The actual operating conditions, storage and data will not be changed.

## Product selection instruction

### Pressure sensor types

| Code | Nominal value | Deacription |
|---|---|---|
| R1 | Sensor types | PT100RTD |

### Transmission module

| Code | Items | Description |
|---|---|---|
| F | Output signal | 4-20mA two wire, power supply: 10-30VDC |
| H | | 4-20mA+HART two wire, power supply: 10.5/16.5-30VDC |
| 1 | | 1-5VDC Three wire, power supply:12-30VDC |
| R | | Modbus-RTU/RS485 Four wire, power supply:5/9-30VDC |
| C | Display | With LCD display |
| A | | Without display |

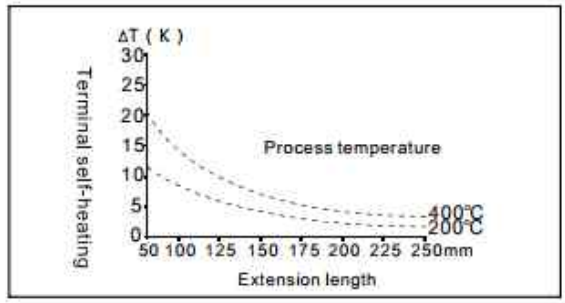
### Display module(C)

### Display module(C)

### Extension tube selection

| Code | Items | Description |
|---|---|---|
| Q1 | Specifications | None |
| Q2 | | Material: SUS304, length: 50mm, outer diameter: Φ12 |
| Q3 | | Material: SUS304, length: 100mm, outer diameter: Φ12 |
| Q4 | | Material: SUS304, length: 150mm, outer diameter: Φ12 |
| Q5 | | Material: SUS304, length: 200mm, outer diameter: Φ12 |

### Extension tube length




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

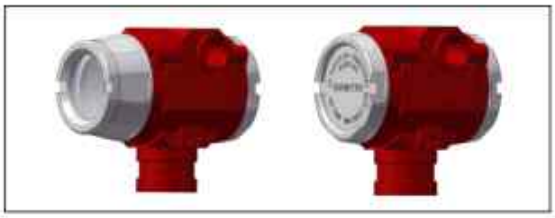
Terminal temperature= environment temperature+ terminal self-healting

### Electrical connection select instruction

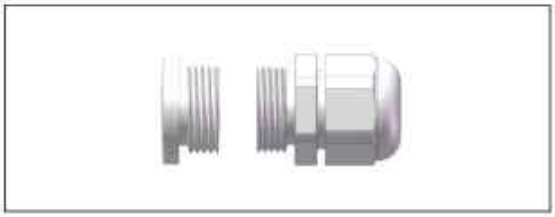
| Code | Item | Description |
|---|---|---|
| T1 | Electrical connection | Aluminum-alloy termimal,2 cable entry, M20*1.5(F), red body, white cover |
| R1 | Cable entry protector | Waterproof connector M20*1.5 one side, blind plug another side, PVC material, 6-8mm diameter cable only, IP67 |
| R2 | | Flame proof, 1/2 NPT(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67 |
| R3 | | Flame proof, M20X1.5(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67 |

## Product selection instruction

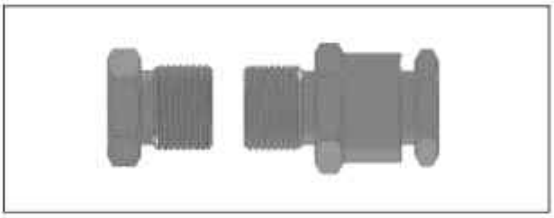
### Housing(T1)



### Standard cable entry adaptor (R1)



### Flame-proof cable entry adaptor (R2/R3)



### Process connection select instruction

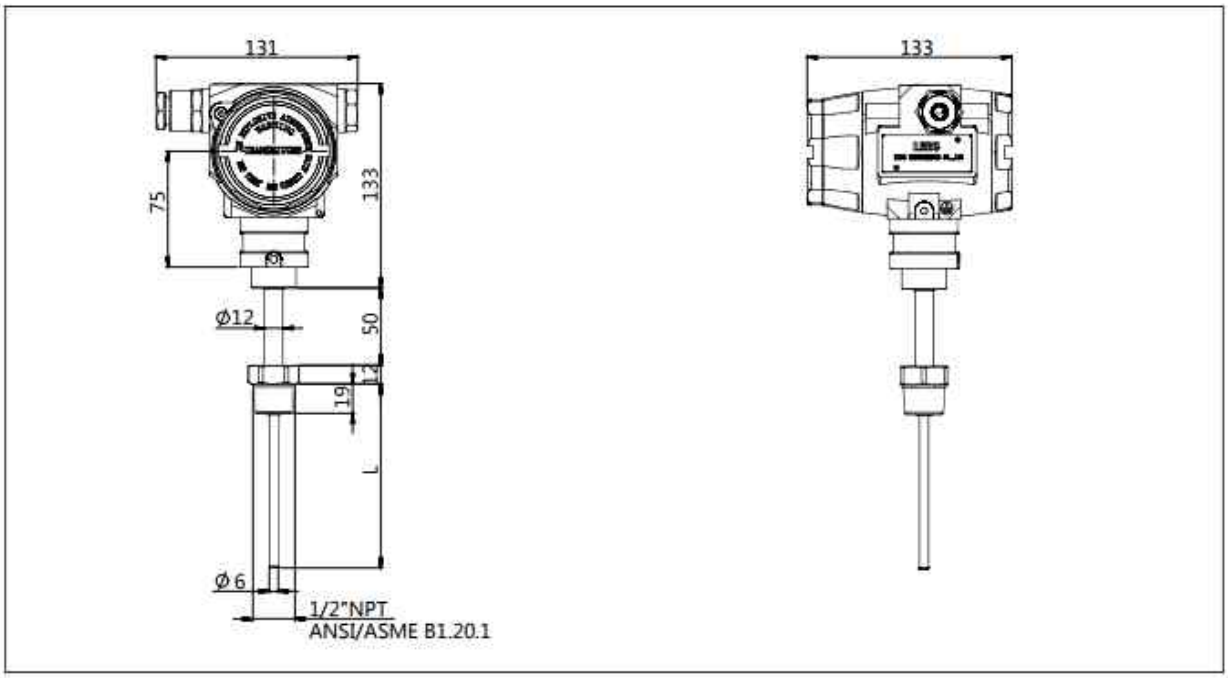
| Code | Items | Description |
|---|---|---|
| G | Mounting type | Fixed process connection mounting |
| H | Material | Movable process connection mounting |
| 4 | | SUS304 |
| 6 | Process connection specifications | SUS316 |
| M01 | | M20*1.5(M),GB/T192-2003 |
| G01 | | G1/2(M), EN837 |
| R01 | | G1/2-14NPT, ANSI/ASME B1.20.1 |
| H01 | | Flange HG/T20592-2009 DN50PN10-PN40 |
| H02 | | Flange HG/T20592-2009 DN50PN10-PN40 |

### Insertion probe select instruction

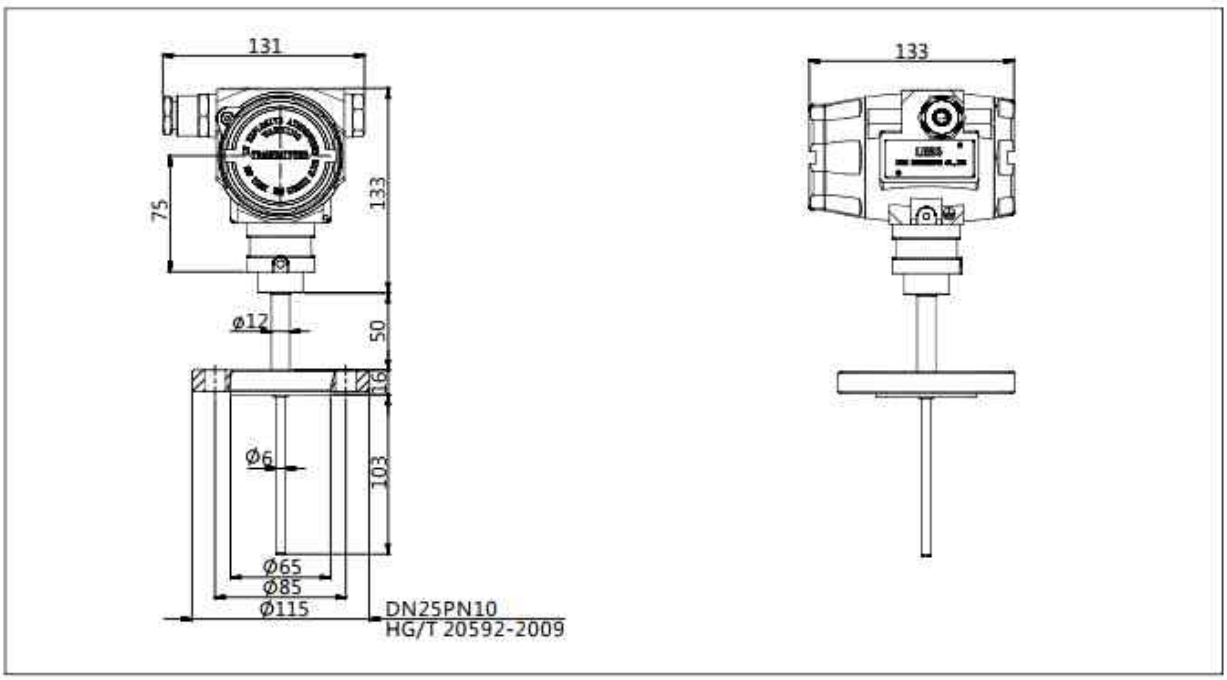
| Code | Items | Description |
|---|---|---|
| D1 | Outer diameter | Diameter: 6mm, probe material is same as process connection material |
| D2 | | Diameter: 8mm, probe material is same as process connection material |
| D3 | | Diameter: 10mm, probe material is same as process connection material |
| 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: 80mm=L0080, the minimum gap is 50mm of customized insertion length. Default insertion length includes thread specifications |

## Product drawing and dimension

### Drawing and dimension (thread) with display( C ) ( unit:mm)



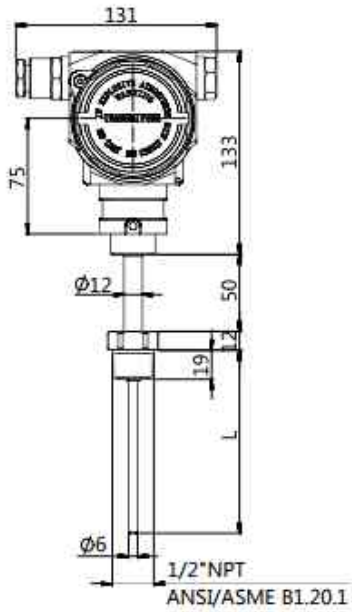

### Drawing and dimension (flange) with display(C) (unit: mm)

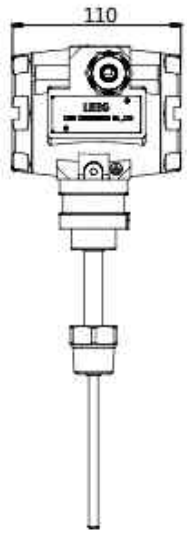



**Disclaimer: all the data used in the product description is not legally binding. Relevant technical details may be changed due to further improve**

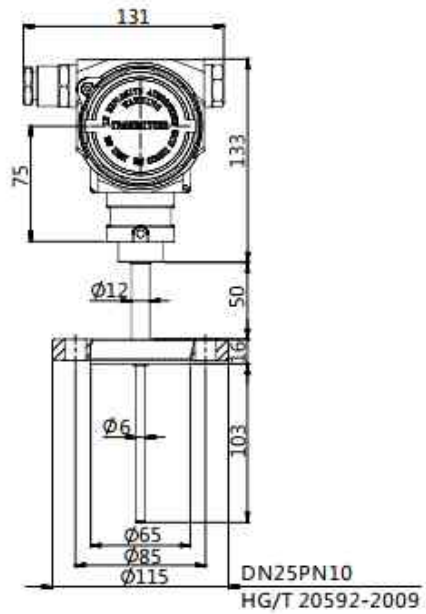
## Product drawing and dimension

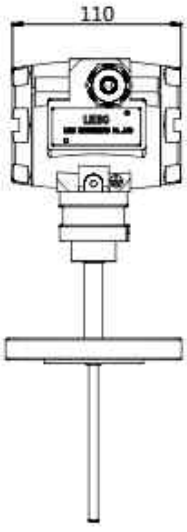
### Drawing and dimension (thread) without display (A) (unit:mm)



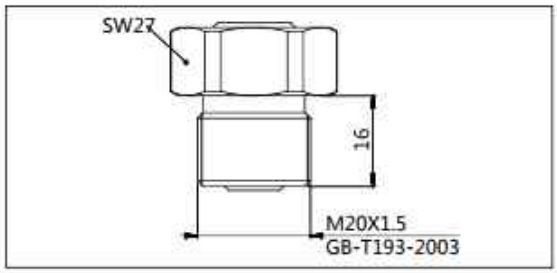

### Drawing and dimension (flange) without display (A) (unit:mm)



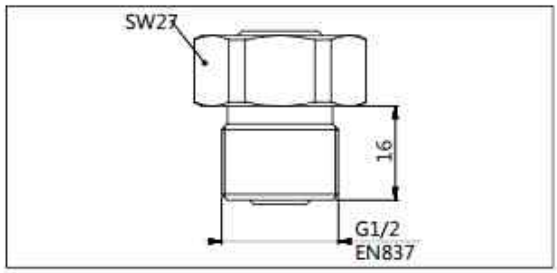



## Product drawing and dimension

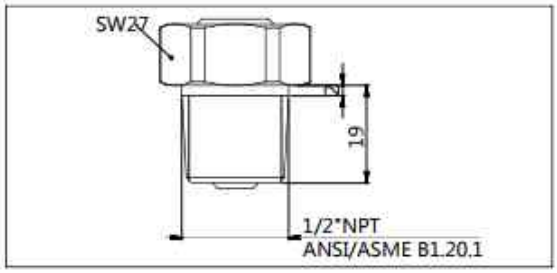
### Process connection(M01) (unit: mm)



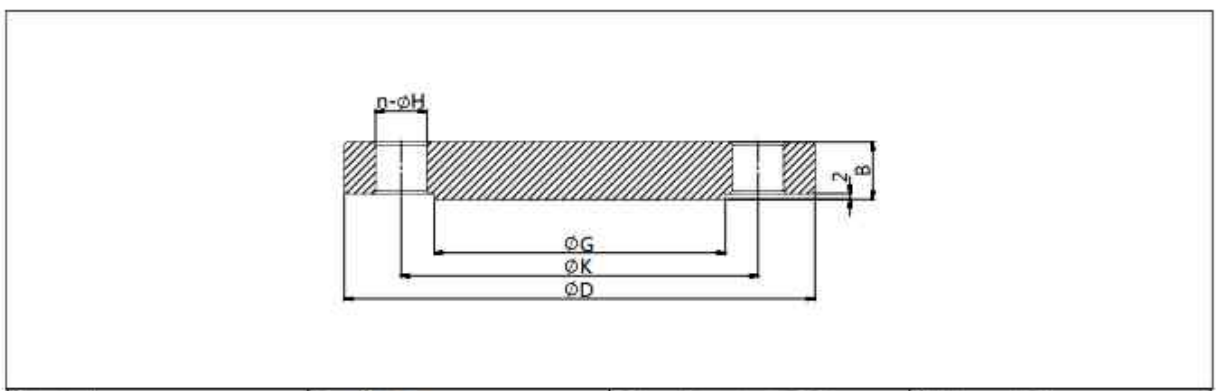

### Process connection(G01) (unit: mm)




### Process connection(R01) (unit: mm)




### Process connection(H01-H02) (unit: mm)




| Standard | Specification | Outer diameter ( ΦD ) | Thickness ( B ) |
|---|---|---|---|
| HG/T20592-2009 | DN50PN10-PN40 | 165 | 20 |
| HG/T20592-2009 | DN25PN10-PN40 | 115 | 16 |
| Hole circle(ΦK) | Raised-face diameter(ΦG) | Hole diameter(ΦH) | Number(n) |
| 125 | 102 | 18 | 4 |
| 85 | 68 | 14 | 4 |

## Ordering informaition chapter

| Item | Parameters | Code | Instruction | (*) fast delivery available |
|---|---|---|---|---|
| | General Model | KC-8200 | Integrated thermal resistance temperature transmitter | |
| | Ex-proof Model | LG200-WRT | Integrated thermal resistance temperature transmitter | |
| Senser | Separator | - | Detailed specifications as following | |
| | Temp' range code | R1 | RT100RTD | * |
| Electrical connetion | Separator | - | Detailed specifications as following | |
| | Electrical connetion | T1 | Aluminum-alloy termimal,2cable entry, M20*1.5(F), red body, white cover | |
| | Cable entry protection | R1 | Waterproof connector M20*1.5 one side, blind plug another side, PVC material, 6-8mm diameter cable only, IP67 | * |
| | | R2 | Flame proof, 1/2 NPT(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67 | * |
| | | R3 | Flame proof, M20X1.5(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67 | |
| Output | Separator | - | Detailed specifications as following | |
| | Output signal | F | 4-20mA two wire, power supply: 10-30VDC | * |
| | | H | 4-20mA+HART two wire, power supply: 10.5/16.5-30VDC | |
| | | 1 | 1-5VDC Three wire, power supply:12-30VDC | |
| | | R | Modbus-RTU/RS485 Four wire, power supply:5/9-30VDC | |
| | Display | C | With LCD display | * |
| | | A | Without display | |
| Extension pipe | Separator | - | Detailed specifications as following | |
| | Extension pipe length | Q1 | None(suitable temperature: -40℃-85℃) | |
| | | Q2 | Material: SUS304, length: 50mm, outer diameter: Φ12 | * |
| | | Q3 | Material: SUS304, length: 100mm, outer diameter: Φ12 | |
| | | Q4 | Material: SUS304, length: 150mm, outer diameter: Φ12 | |
| | | Q5 | Material: SUS304, 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, ANSI/ASME B1.20.1 | * |
| | | H01 | Flange HG/T20592-2009 DN50PN10 | * |
| | | H02 | Flange HG/20592-2009DN25PN10 | * |
| Insertion probe | Separator | - | Detailed specifications as following | |
| | Outer diameter | D1 | Diameter: 6mm, probe material is same as process connection material | * |

## Ordering information chapter

| | | | | |
|---|---|---|---|---|
| | | 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 | |
| | Insertion length | LXXXX | Customized insertion length: 0 < LXXXX< 3000mm, samples: 80mm=L0080, 150mm=L0150 | |
| Additional options | Separator | - | Detailed specifications as following | |
| | Calibration report | /Q1 | Calibration report provided by our company | |
| | Approvals | /E1 | Flame proof certificate, ExdIICT6, NEPSI | |
| | Wetted parts treatment | /G1 | Ungrease treatment | |
| | | /G1 | Electropolishing 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 |

## Flame proof certificate

| | |
|---|---|
| Certification organization | NEPSI |
| License scope | LG200-W series temperature transmitter |
| Explosion-proof mark | ExdIICT6 |
| Working environmental temperature | -25-+60℃ |
| Registration number | GYB16.1254X |

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• GOLDEN RULES

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질량유량계 & 계측기
전문 제조 기업

대리점

Certified in accordance with
KC Q ISO 9001 : 2015
KC Q ISO 14001 : 2015

(주)골든룰