

Product introduction

Description

Hygienic pressure transmitter



Vertical installation



Horizontal installation

Hygienic pressure transmitter, designed for food and pharmaceutical industry, is suitable for CIP/SIP cleaning and sterilization. Smart compact design, the welded process diaphragm medium parts is made of high quality stainless steel 316L, roughness $\leq 0.4\mu\text{m}$, filling fluid with hygiene standard in line with FDA certification, variety of international standard process connections are available.

Main parameters

| | |
|--------------------|--|
| Pressure types | Gauge pressure |
| Measuring range | 10kPa-3MPa, please refer to the ordering information chapter |
| Output signal | 4-20mA, 4-20mA+HART, customer |
| Reference accuracy | $\pm 0.2\%$ URL, $\pm 0.5\%$ URL |

Measuring medium

The fluids which compatible with wetted parts

Field of application

Pressure, level

Approvals



Technical specifications

Measuring range and limit

| Nominal value | Smallest calibratable span | Lower range limit (LRL) | Upper range limit (URL) | Overpressure limit * |
|--|----------------------------|---------------------------|---------------------------|----------------------|
| 40kPa | 10kPa | -40kPa | 40kPa | 1MPa |
| 250kPa | 25kPa | -100kPa | 250kPa | 4MPa |
| 1MPa | 100kPa | -100kPa | 1MPa | 6MPa |
| 3MPa | 300kPa | -100kPa | 3MPa | 15MPa |
| The unit of the measuring range above can be converted into kg/cm ² 、MPa and kPa. 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. | | | | |
| *Limit value of overpressure: depends on the pressure value of the parts with lowest pressure capacity | | | | |

Standard specifications and reference conditions

Test standard: GB/T28474 / IEC60770; Zero based-calibration span, Linear output, Silicon oil filling, 316L stainless steel isolated diaphragm, 4-20mA analog output

Power supply effects

When power supply voltage is within 10.5/16.5-55VDC, zero and span change should not more than ±0.005%URL/V

Performance specifications

The overall performance including but not limited to 【reference accuracy】 , 【environment temperature effects】 and other comprehensive error

Typical accuracy: ±0.2%URL

Stability: ±0.2% URL/ 1 year

Loading effects

Zero and span change should not be more than ± 0.05% URL/kΩ

Reference accuracy

Including linearity, hysteresis and repeatability. calibration temperature: 20℃ ± 5℃

| | | | |
|--|---------------|----------|---|
| Linear output accuracy | TD≤10 (Note1) | ±0.2%URL | Nominal value: 40kPa, 250kPa 1MPa, 3MPa |
| | Max value | ±0.5%URL | |
| The accuracy of square root output is 1.5 times of above linear reference output accuracy. | | | |
| Note 1: TD is Turn down, TD=URL/ URV-LRV | | | |

Mounting position effects

The effects do not exceed 1.67kPa (Measured after 180° rotation along with the vertical direction of the diaphragm), and can be corrected by zero clearing function.

Vibration effects

| | |
|----------------------|---|
| Vibration resistance | According to IEC60068-2-6 , 10g RMS (25-2000HZ) |
| Impact resistance | According to IEC60068-2-27 , 500g/1ms |

Ambient temperature effects(Typical)

| | |
|--|--------------|
| Within the range - 20-80℃ total impact | ±0.2%URL/10k |
|--|--------------|

Output signal

| Signal | Type | Output |
|-------------|-----------|----------|
| 4-20mA | Linearity | Two wire |
| 4-20mA+HART | Linearity | Two wire |

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Technical Specifications

Insulation resistance

≥ 20M Ω@ reference, 100VDC

Damping time

Total damping time constant: equal to the sum of damping time of amplifier and sensor capsule

Damping time of amplifier: 0-100S adjustable

Diaphragm capsule (isolated diaphragm and silicon oil filling) damping time: ≤0.2S

Startup after power off: ≤6S

Normal services after data recovery: ≤31S

Weight

Net weight: about 0.8kg (without mounting brackets and process connection accessory)

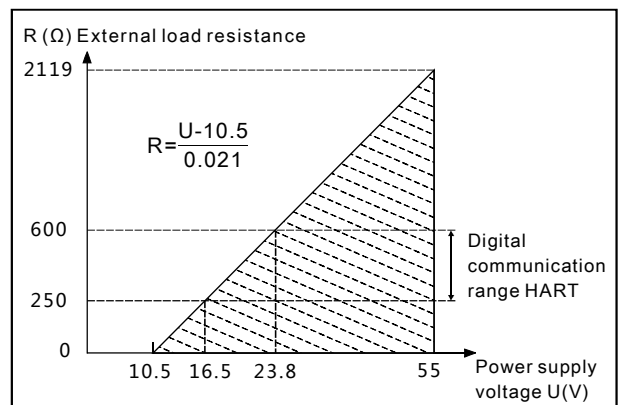
Environment condition

| Items | Operational condition |
|---------------------------------------|---|
| Working temperature | -40-85°C, integrated LCD display: -20-70°C |
| Storage temperature | -40-110°C, integrated LCD display: -40-85°C |
| Media temperature | Hygienic fluid filling: -10-125°C |
| | Silicon oil filling: -40-120°C |
| Working humidity | 0-95%RH |
| Protection class | IP67 |
| Dangerous condition | ExiallCT4(GYB16.1965X)* |
| *Please consult engineers for details | |

Power supply

| Item | Operating conditions |
|-----------------------|--|
| Standard | 10.5-55VDC |
| HART protocol | 16.5-55VDC, communication load resistance 250Ω |
| Load resistance | 0-2119 Ω for working condition, 250-600Ω for HART protocol |
| Transmission distance | <1000m |
| Power consumption | ≤500mW@24VDC , 20.8mA |

Power supply and load requirements



Technical Specifications

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) 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 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.

Menu function

Transmission module type

| Output signal | Local control | Remote control |
|---------------|-----------------------|----------------|
| 4-20mA+HART | LCD/3 buttons on body | HART |
| 4-20mA | LCD/3 buttons on body | - |

LCD display unit

| Display mode | Details |
|--------------|--|
| PV | Process variable shows on main screen, percentage and progress bar shows on secondary screen |
| mA | Current shows on main screen, percentage and progress bar shows on secondary screen |
| % | Percentage shows on main screen, percentage and progress bar shows on secondary screen |

Unit

| Unit | Definition |
|---|--------------------------------|
| kPa | Kilopascal |
| MPa | Megapascals |
| bar | Bar |
| psi | Pounds per square inch |
| mmHg | Millimetre(s) of mercury@0°C |
| mmH2O | Millimeter of water@4°C |
| mH2O | Meter of water@4°C |
| inH2O | Inches of water@4°C |
| ftH2O | Feet of water@4°C |
| inHg | Inches of mercury@0°C |
| mHg | Meter mercury column@0°C |
| Torr | Torr |
| mbar | Millibar |
| g/cm2 | Gram per square centimeter |
| kg/cm2 | Kilogram per square centimeter |
| Pa | PA |
| atm | Standard atmospheric pressure |
| mm | Millimeter(Note1) |
| m | Meter(Note1) |
| Note1: length unit need mark medium density | |

Measuring menu set

| Mark | State |
|------|-------------------------|
| URV | Upper range value, 20mA |
| LRV | Lower range value, 4mA |

Damping time

| Units | Setting range |
|-------|---------------|
| S | 0-100 |

Analog output type

| Parameters | Output type |
|-------------------|-------------|
| mA LINER | Linearity |
| mA $\sqrt{\quad}$ | Square root |

Alarm signal

| Parameters | Alarm signal |
|------------|--------------|
| ALARM NO | None |
| ALARM H | 20.8mA |
| ALARM L | 3.8mA |

Fix output

| Parameters | Fix output value |
|------------|------------------|
| FIX/C NO | None |
| 3.8000 | 3.8000mA |
| 4.0000 | 4.0000mA |
| 8.0000 | 8.0000mA |
| 12.000 | 12.000mA |
| 16.000 | 16.000mA |
| 20.000 | 20.000mA |
| 20.800 | 20.800mA |

Quick menu

| Parameter | Instruction |
|-------------------------|---|
| PV=0 | Set current output to zero value, used to correct the error caused by static pressure and installation. |
| Zero adjustment | 4mA re-range with pressure |
| Span adjustment | 20mA re-range with pressure |
| Restore factory setting | Restore backup data when error |

Product selection instruction

Sensor select instruction

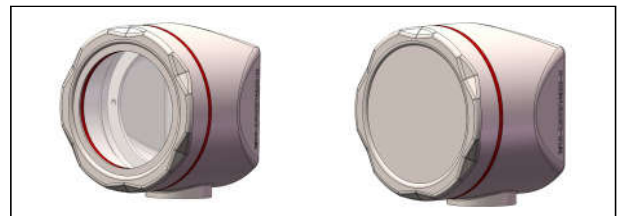
| Code | Nominal value | Description |
|---|---------------|--|
| D403G | 40kPa | Range -40kPa-40kPa, smallest calibratable span 10kPa |
| D254G | 250kPa | Range -100kPa-250kPa, smallest calibratable span 25kPa |
| D105G | 1MPa | Range -100kPa-1MPa, smallest calibratable span 100kPa |
| D305G | 3MPa | Range -100kPa-3MPa, smallest calibratable span 300kPa |
| 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 $\leq URV - LRV \leq$ maximum measuring range | | |

| Code | Position | Instruction |
|------|-------------|------------------------------|
| F | Sensor seal | Stainless steel welding seal |

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)



Electrical connection

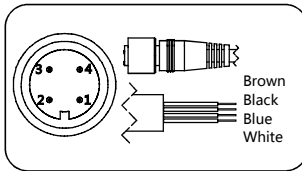
Aviation plug, M12*1, 4 pin(H2)

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

Product selection instruction

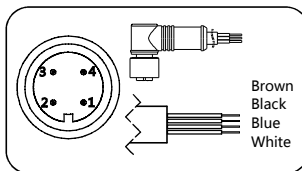
Electrical connection accessories

Aviation plug straighter(J1)



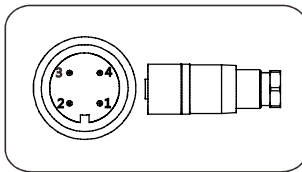
| Label | Two wires |
|---------|-----------|
| 1/Brown | Power+ |
| 2/White | |
| 3/Blue | |
| 4/Black | Power - |

Aviation plug elbow(J2)



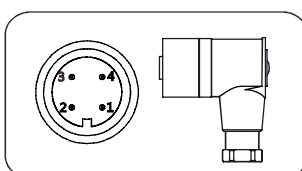
| Label | Two wires |
|---------|-----------|
| 1/Brown | Power+ |
| 2/White | |
| 3/Blue | |
| 4/Black | Power - |

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 - |

Transmission module

| Code | Items | Description |
|------|---------------|--|
| F | Output signal | 4-20mA two wire, power supply: 10.5-55VDC |
| H | | 4-20mA+HART two wire, power supply: 16.5-55VDC |
| A | Display | Without display |
| C | | With LCD display |

Display module (C)

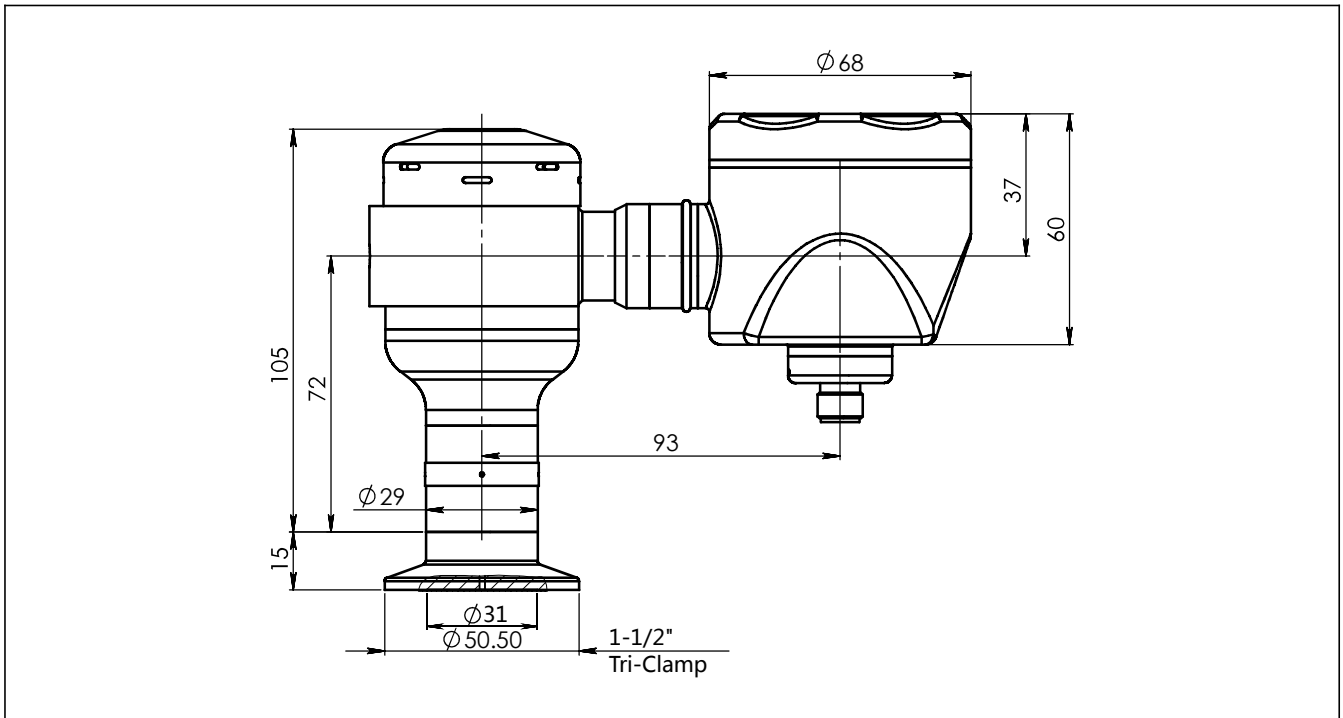


Process connection select instruction

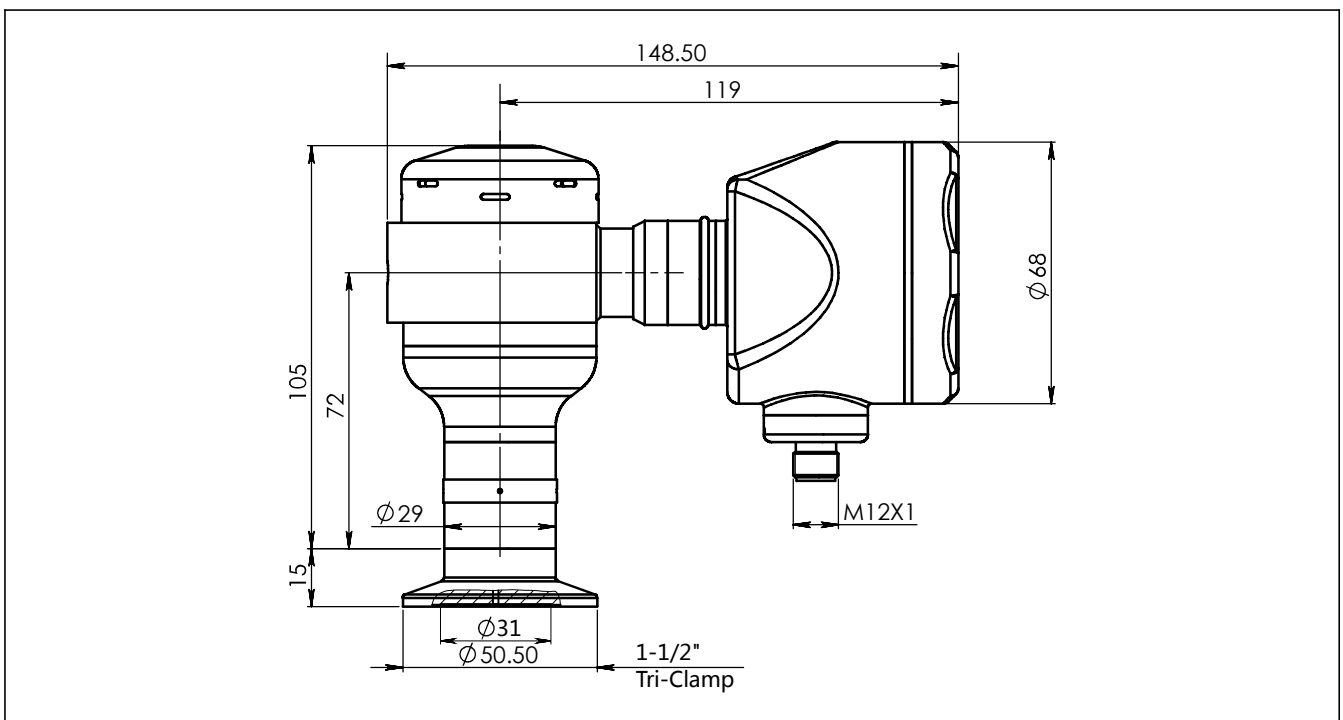
| Code | Items | Description |
|------|-----------------------------------|--|
| 6 | Process connection material | Stainless steel, SUS316 |
| NT | Connection type | Standard connection, medium temperature: -25-85℃ |
| F | Isolated filling fluid | Hygienic fluid filling, Neobee M-20, process temperature: -10-180℃ |
| S | | Silicon oil filling, process temperature: -45-205℃ |
| S | Isolated diaphragm material | SUS316L |
| H | | Hastelloy C |
| K01 | Process connection specifications | Tri-clamp 1-1/2" |
| K02 | | Tri-clamp 2" |
| K03 | | DIN32676 DN32 |
| K04 | | DIN32676 DN40 |
| K05 | | DIN32676 DN50 |
| K06 | | ISO2852 DN38 |
| K07 | | ISO2852 DN40 |
| K08 | | ISO2852 DN51 |
| K09 | | DIN11851 DN25 |
| K10 | | DIN11851 DN40 |
| K11 | | DIN11851 DN50 |
| K12 | | SMS DN1-1/2" |
| K13 | | SMS DN2" |
| K14 | | IDF DN1-1/2" |
| K15 | | IDF DN2" |
| K18 | | DRD |
| K20 | | Plug in tube flush hygienic clamp |

Product drawing and dimension

Standard drawing and dimension with display (C) / without display (A) vertical installation (F1) (unit:mm)



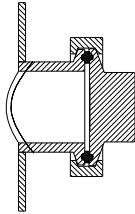
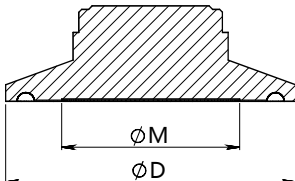
Standard drawing and dimension with display (C) / without display (A) horizontal installation (F2) (unit:mm)



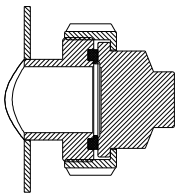
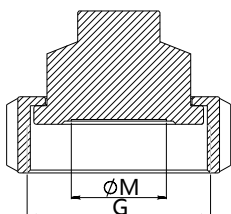
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Product drawing and dimension

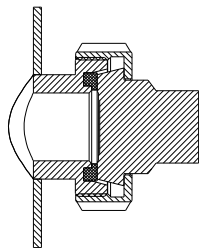
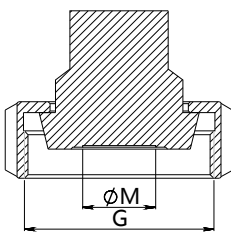
Process connection (K01-K08)(unit: mm)

| Installation Sketches  | | | |
|--|---------------|----------|---------------------|
| Dimension  | | | |
| Standard | Specification | Size(ΦD) | Diaphragm size (ΦM) |
| Tri-Clamp | 1-1/2" | 50.5 | 31 |
| Tri-Clamp | 2" | 64 | 42 |
| DIN32676 | DN32 | 50.5 | 31 |
| DIN32676 | DN40 | 50.5 | 31 |
| DIN32676 | DN50 | 64 | 42 |
| ISO2852 | DN38 | 50.5 | 31 |
| ISO2852 | DN40 | 64 | 42 |
| ISO2852 | DN51 | 64 | 42 |

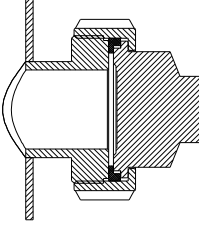
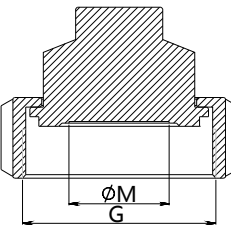
Process connection (K12-K13)(unit: mm)

| Installation Sketches  | | | |
|--|---------------|-----------|--------------------|
| Dimension  | | | |
| Standard | Specification | Size(G) | Diaphragm size(ΦM) |
| SMS | 1-1/2" | Rd 60*1/6 | 31 |
| SMS | 2" | Rd 70*1/6 | 42 |

Process connection (K09-K11)(unit: mm)

| Installation Sketches  | | | |
|--|---------------|-----------|--------------------|
| Dimension  | | | |
| Standard | Specification | Size(G) | Diaphragm size(ΦM) |
| DIN11851 | DN25 | Rd 52*1/6 | 20 |
| DIN11851 | DN40 | Rd 65*1/6 | 31 |
| DIN11851 | DN50 | Rd 78*1/6 | 42 |

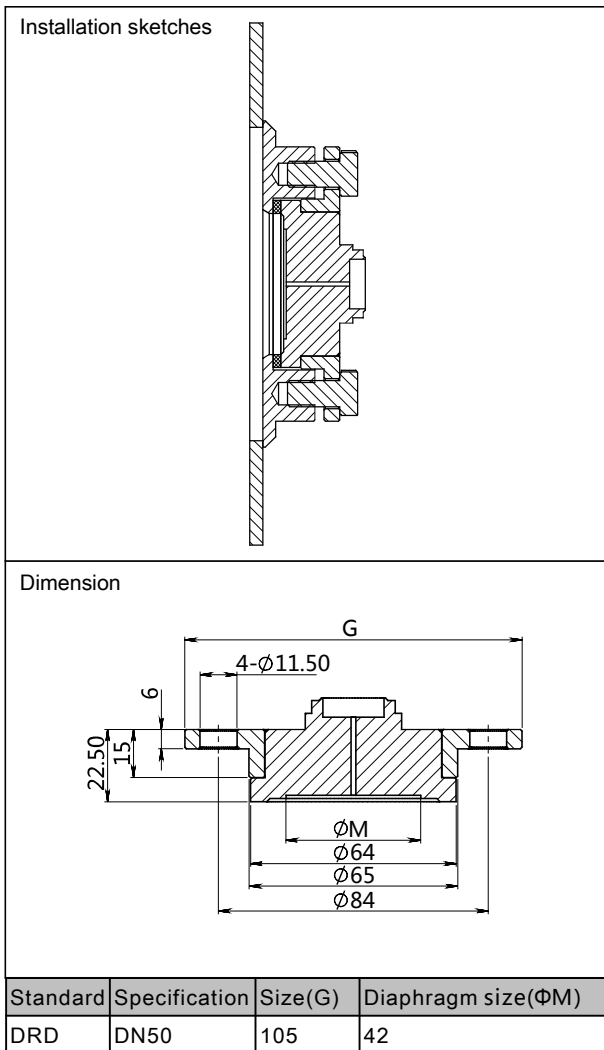
Process connection (K14-K15)(unit: mm)

| Installation Sketches  | | | |
|--|---------------|------------|--------------------|
| Dimension  | | | |
| Standard | Specification | Size(G) | Diaphragm size(ΦM) |
| IDF | 1-1/2" | IDF 1-1/2" | 31 |
| IDF | 2" | IDF 2" | 42 |

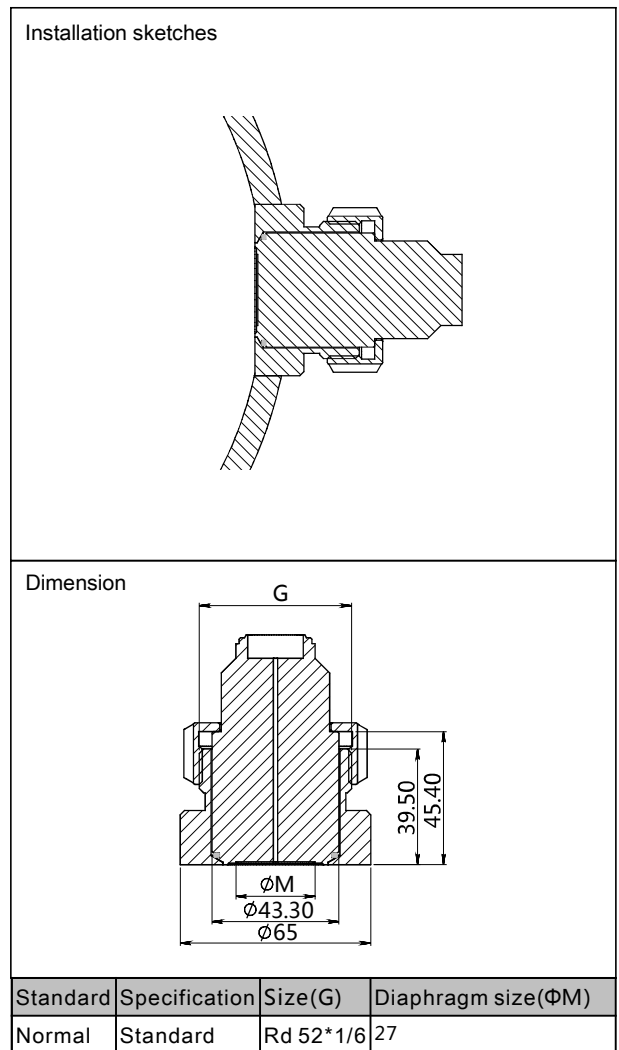
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Product drawing and dimension

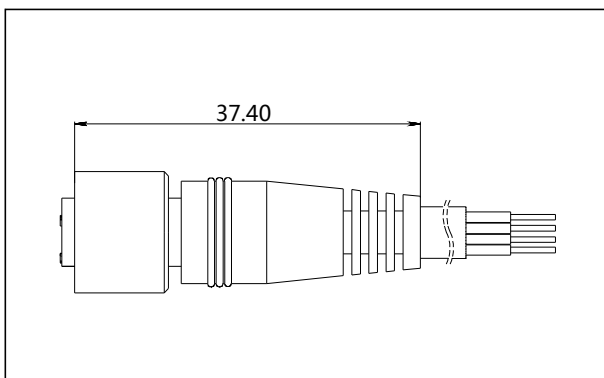
Process connection (K18) (unit: mm)



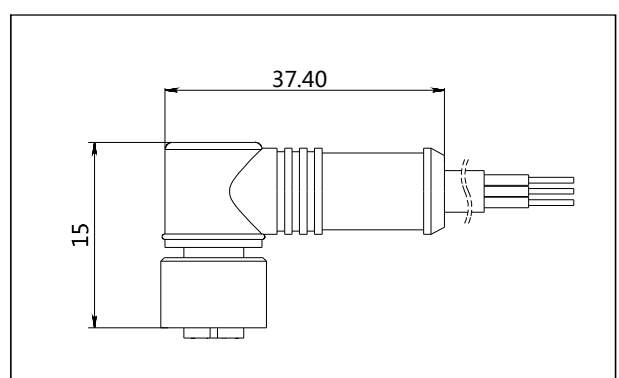
Process connection (K20) (unit: mm)



Aviation female plug straighter(J1) (unit: mm)



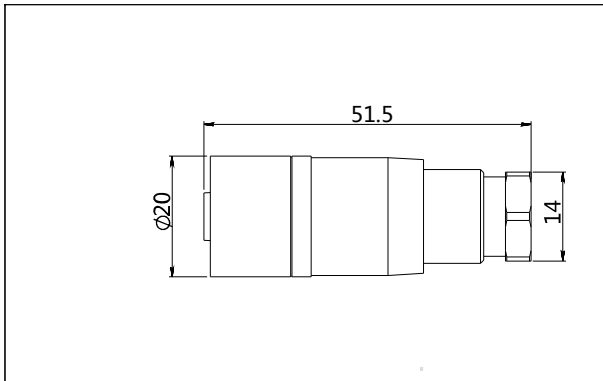
Aviation female plug elbow(J2) (unit: mm)



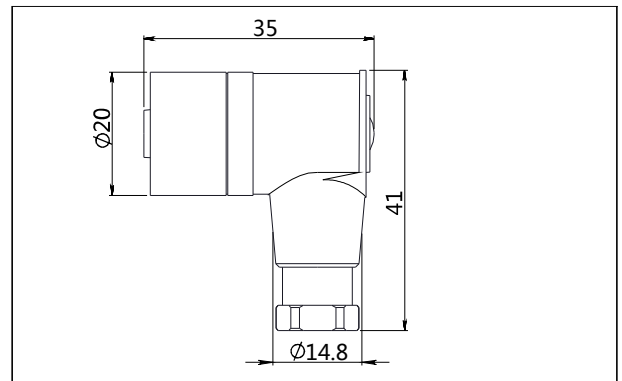
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Product drawing and dimension

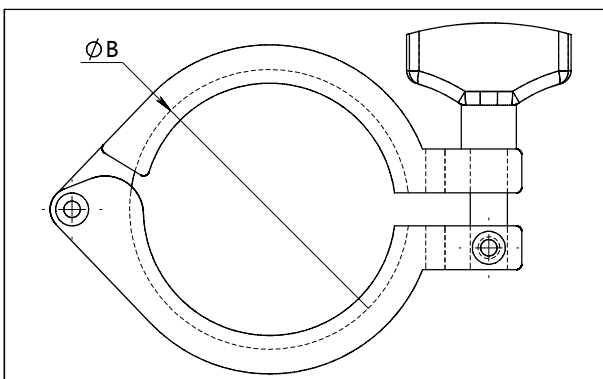
Aviation female plug straighter(J4) (unit: mm)



Aviation female plug elbow(J5) (unit: mm)

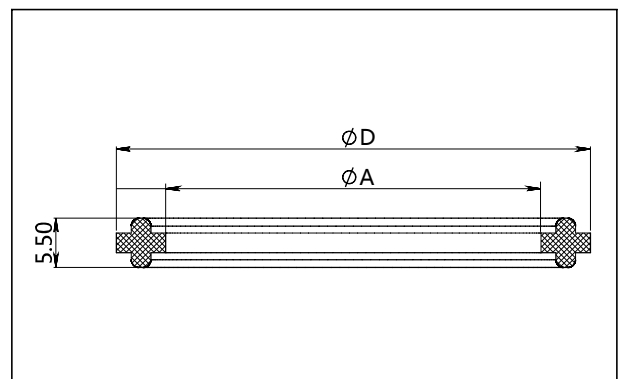


Clamp(G1-G2)(unit: mm)



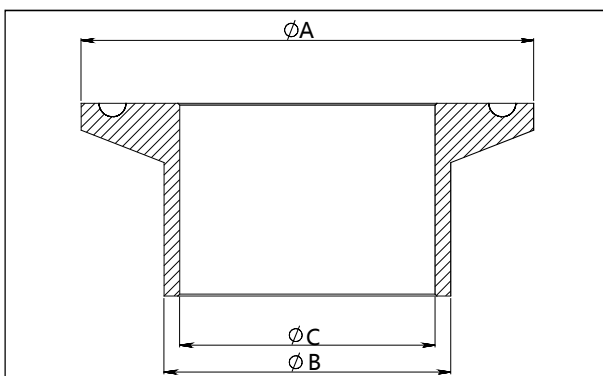
| Standard | Specification | Dimension(ΦB) |
|-----------|---------------|---------------|
| Tri-Clamp | 1-1/2" | 53.9 |
| Tri-Clamp | 2" | 67.4 |

Sealing gasket (M1-M2) (unit: mm)



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

Welding adaptor(Z1-Z1)(unit : mm)



| 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 | SMP858-TSF | Monosilicon gauge pressure transmitter(Double diaphragm structure) | * |
| Sensor | Separator | - | Detailed specifications as following | |
| | Pressure range code | D403G | Nominal value(URL): 40kPa | * |
| | | D254G | Nominal value(URL): 250kPa | * |
| | | D105G | Nominal value(URL): 1MPa | * |
| | | D305G | Nominal value(URL): 3MPa | |
| | Sensor seal | F | Stainless steel welding seal | * |
| 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 | H | 4-20mA+HART two wire, power supply: 16.5-55VDC | * |
| | | F | 4-20mA two wire, power supply: 10.5-55VDC | |
| | Display | C | LCD display | * |
| | | A | Without LCD display | |
| Process connection | Separator | - | Detailed specifications as following | |
| | Process connection material | 6 | Stainless steel SUS316 | * |
| | Connection type | NT | Standard connection, process temperature -25~85℃ | * |
| | Isolated filling fluid | F | Hygienic fluid filling, Neobee M-20, process temperature: -10~180℃ (FDA approved) | |
| | | S | Silicon oil, process temperature: -45~205℃ | * |
| | Isolated diaphragm material | S | SUS316L | * |
| | | H | Hastelloy C | |
| | Process connection specifications | K01 | Tri-clamp 1-1/2", max measuring range: 2MPa | * |
| | | K02 | Tri-clamp 2", max measuring range: 2MPa | |
| | | K03 | DIN32676 DN32, max measuring range: 1.6MPa | |
| | | K04 | DIN32676 DN40, max measuring range: 1.6MPa | |
| | | K05 | DIN32676 DN50, max measuring range: 1.6MPa | |
| | | K06 | ISO2852 DN38, max measuring range: 4MPa | |

Ordering information chapter

| | | | | |
|---|---------------------------------|--------------------|---|---|
| | | K07 | ISO2852 DN40, max measuring range 4MPa | |
| | | K08 | ISO2852 DN51, max measuring range 2.5MPa | |
| | | K09 | DIN11851 DN25, max measuring range 2.5MPa | |
| | | K10 | DIN11851 DN40, max measuring range 2.5MPa | |
| | | K11 | DIN11851 DN50, max measuring range 2.5MPa | |
| | | K12 | SMS DN1-1/2", max measuring range 2.5MPa | |
| | | K13 | SMS DN2", max measuring range 2.5MPa | |
| | | K14 | IDF DN1-1/2", max measuring range: 2MPa | |
| | | K15 | IDF DN2", max measuring range: 2MPa | |
| | | K18 | DRD, max measuring range: 2.5MPa | |
| | | K20 | Plug in tube flush hygienic clamp, max measuring range: 2MPa | |
| | | Additional options | Separator | - |
| | 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 cable, 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, material: silicon rubber, process temperature range: -60-200°C (Approved by FDA) | * |
| | | /M2 | 2" sealing gasket, material: silicon rubber, process temperature range: -60-200°C (Approved by FDA) | |
| | | /Z1 | Welding adapter for 1-1/2" tri-clamp (Accord with regulation 74-06 of 3A certificate) | * |
| | | /Z2 | Welding adapter for 2" tri-clamp (Accord with regulation 74-06 of 3A certificate) | |
| | Calibration report | /Q1 | Calibration report provided by our company | * |
| | Approvals (multiple) | /I1 | Intrinsic safety certificate, ExialICT4, NEPSI (Please consult engineers for details) | |
| | | /F3 | CE certificate (Please consult engineers for details) | |
| | | /H1 | 3-A certificate (Please consult engineers for details) | * |
| | Wetted parts treatment | /G1 | Ungrease treatment | |
| | | /G2 | Electropolishing treatment | |
| Note1: The process connections accord with regulation 74-06 of 3A certificate | | | | |

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 | P(no specific settings) |
| Alarm signal | Alam | 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 value |
| 20mA Upper range value | URV | According to the order value |
| Process unit | U | According to the order |

Approvals

Factory certificate

| | |
|---------------------------|---|
| Certificate organization | Intertek |
| Quality management system | ISO9001-2008 |
| Scope of certification | Design and production of pressure transmitter |
| Registration number | 110804039 |

CE

| | |
|--------------------------|------------------------------------|
| Certificate organization | ISET |
| License scope | SMP858 series pressure transmitter |
| Mark | CE |
| EMC instruction | 2014/30/EU |
| Standard | EN61326-1: 2013 |
| Registration number | IT051353LG161207 |

Intrinsic safety certificate

| | |
|--|---|
| Certification organization name | NEPSI |
| License scope | SMP858 series pressure transmitter |
| Explosion-proof mark | ExialICT4 |
| Ambient temperature | -40-+60°C |
| Medium maximum temperature | +120°C |
| Registration number | GYB16.1965X |
| Intrinsically safe parameter description | Maximum input voltage: 28VDC |
| | Maximum input current: 100mA |
| | Maximum input power: 0.7w |
| | Maximum internal equivalent parameters Ci(uF): 0 |
| | Maximum internal equivalent parameters Li(mH): 0.01 |