Measurement made easy

2600T Series Pressure Transmitters

Engineered solutions for all applications

Selectable maximum working pressure
— Up to 41 MPa, 5945 psi

Base accuracy
— ± 0.075 % / ± 0.04 %

Span limits
— 0.05 ... 2000 kPa; 0.2 in H₂O ... 290 psi
— 0.6 ... 41 MPa; 87 ... 5945 psi absolute pressure

Corrected mass flow measurement for gases, steam and fluids
— Dynamic correction of pressure and temperature changes

One transmitter replaces three separate transmitters
— Saving initial purchase costs

Reduced process penetrations
— Saves money and reduces the chance of leaks

Fewer transmitters, less wiring and fewer shut-off valves
— Reduce installation costs

Greater reliability
— Due to fewer devices and less wiring

Multiple communications protocol availability
— Provides integration into HART®, PROFIBUS PA and FOUNDATION fieldbus and Modbus platforms
— Upgrade options through interchangeable electronics with automatic configuration

Full compliance with PED category III
Introduction

Due to its multisensor technology, the 267C./269C. permits measurement of three separate process variables simultaneously and provides dynamic calculation of fully compensated mass flowrate for steam and liquids respectively standard volume flow for gases. It measures differential pressure and absolute pressure from a single sensor and process temperature from a standard Pt 100 Resistance Temperature Detector (RTD).

The flow calculation of this transmitter includes compensation of pressure and/or temperature as well as more complex variables such as discharge coefficient, thermal expansion, Reynolds number and compressibility factor.

The 267C./269C. includes flow equations for superheated steam, saturated steam, gases and liquids so that one model is all you need in your system.

The enhanced compensation approach of 267C./269C. provides much better accuracy than the “old approach” in which three different transmitters, differential pressure, absolute pressure and temperature, report their values to a DCS, PLC or flow computer. The calculation considers changes in temperature and pressure according to the following formula:

\[ Q_m = \frac{\Delta p \cdot d}{T} \]

Discharge coefficient

This is defined as the true flowrate divided by the theoretical flowrate and corrects the theoretical equation for the influence of velocity profile (Reynolds number), the assumption of no energy loss between taps and pressure tap location. It is dependent on the primary flow element, the diameter ratio (Beta ratio) and the Reynolds number. Reynolds number is in turn dependent on the viscosity, density and velocity of the medium as well as the pipe diameter per the following equation:

\[ Re = \frac{v \cdot D \cdot \rho}{\mu} \]

\[ v = \text{velocity} \]
\[ D = \text{interior pipe diameter} \]
\[ \rho = \text{medium density} \]
\[ \mu = \text{medium viscosity} \]

Dynamic compensation for discharge coefficient provides high accuracy for flow measurement with primary flow elements.

Gas expansion factor

This corrects for density differences between pressure taps due to expansion of compressible media. It does not apply for liquids which are essentially non-compressible. The gas expansion factor is dependent on the diameter ratio, the isentropic exponent, the differential pressure and the static pressure of the fluid according to the following equation:

For orifices:

\[ Y_1 = 1 - (0.41 + 0.35 \cdot \beta^4) \cdot \frac{\Delta p}{p} \]

For nozzles:

\[ Y_1 = \left[ \frac{2}{\kappa - 1} \left( 1 - \beta^4 \right) \right] \left( 1 - \left( \frac{\Delta p}{p} \right)^{\kappa - 1} \right) - 1 \]

\[ \beta = \text{ratio of diameters (Beta ratio)} \]
\[ \Delta p = \text{differential pressure} \]
\[ p = \text{static pressure} \]
\[ \kappa = \text{Isentropic exponent} \]

Velocity of approach factor

Is dependent on the Beta ratio as defined by the following equation:

\[ E_v = \frac{1}{\sqrt{1 - \beta^4}} \]

Beta ratio is dependent on bore diameter and pipe diameter which in turn are functions of temperature. The material of the process pipe and primary flow element expands or contracts with changes in temperature of the fluid being measured. The thermal expansion coefficients are dependent on the material of the pipe and flow element and are used for calculating the change in diameters. This ensures high flowrate accuracy during low and high temperature applications.
Medium density

This directly affects the flowrate calculation. The 267C./269C. compensates for density of media resulting from changes in temperature and/or pressure as follows:

- Gases as a function of p and T per the gas law equations. Calculation of the compressibility factors for natural gas is described in the American AGA 8 standard.
- Super-heated steam as function of p and T based on steam tables
- Saturated steam as function of p based on steam tables
- Liquids as a function of T

Mass flow calculation with the 267C./269C. will be configured for the following differential flow sensors:

- Orifice corner taps, ISO
- Orifice flange taps, ISO
- Orifice D and D/2 taps, ISO
- Orifice corner taps, ASME
- Orifice flange taps, ASME
- Orifice D and D/2 taps, ASME
- Orifice flange taps, AGA3
- Orifice 2.5D and 8D taps
- Small bore orifice, flange taps
- Small bore orifice, corner taps
- Nozzle ISA 1932
- Nozzle, long radius wall tap, ISO
- Nozzle, long radius wall tap, ASME
- Venturi, rough cast inlet, ISO
- Venturi, machined inlet, ISO
- Venturi, welded inlet, ISO
- Venturi, rough cast inlet, ASME
- Venturi, machined inlet, ASME
- Venturi, welded inlet, ASME
- Venturi, nozzle, ISO
- Area Averaging Meter
- Pitot tube, ISO 3966
- V-cone
- Wedge element
- Integral Orifice Assembly
- Density correction (unknown primary element)

Configuration of full functionality of 267C./269C. including all data necessary for mass flow compensation will use the PC-based tool SMART VISION with DTM MV 2600T.

Functional Specifications

Measuring range and span limits

<table>
<thead>
<tr>
<th>Differential pressure sensors</th>
<th>Sensor code</th>
<th>Upper range limit (URL)</th>
<th>Lower range limit (LRL)</th>
<th>Minimum span</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1 kPa</td>
<td>10 mbar</td>
<td>0</td>
<td>0.05 kPa</td>
</tr>
<tr>
<td></td>
<td>4 in H₂O</td>
<td>0.5 mbar</td>
<td>0.2 in H₂O</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>6 kPa</td>
<td>60 mbar</td>
<td>0</td>
<td>0.2 kPa</td>
</tr>
<tr>
<td></td>
<td>24 in H₂O</td>
<td>2 mbar</td>
<td>0.8 in H₂O</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>40 kPa</td>
<td>400 mbar</td>
<td>0</td>
<td>0.4 kPa</td>
</tr>
<tr>
<td></td>
<td>160 in H₂O</td>
<td>4 mbar</td>
<td>1.6 in H₂O</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>250 kPa</td>
<td>2500 mbar</td>
<td>0</td>
<td>2.5 kPa</td>
</tr>
<tr>
<td></td>
<td>1000 in H₂O</td>
<td>25 mbar</td>
<td>10 in H₂O</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>2000 kPa</td>
<td>20 bar</td>
<td>0</td>
<td>20 kPa</td>
</tr>
<tr>
<td></td>
<td>290 psi</td>
<td>2.0 bar</td>
<td>2.9 psi</td>
<td></td>
</tr>
</tbody>
</table>

Absolute pressure sensors

<table>
<thead>
<tr>
<th>Sensor code</th>
<th>Upper range limit (URL)</th>
<th>Lower range limit (LRL)</th>
<th>Minimum span</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>600 kPa</td>
<td>0 abs</td>
<td>6 kPa</td>
</tr>
<tr>
<td></td>
<td>6 bar</td>
<td>0.06 bar</td>
<td>0.87 psi</td>
</tr>
<tr>
<td></td>
<td>87 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2000 kPa</td>
<td>0 abs</td>
<td>20 kPa</td>
</tr>
<tr>
<td></td>
<td>20 bar</td>
<td>0.2 bar</td>
<td>2.9 psi</td>
</tr>
<tr>
<td></td>
<td>290 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10000 kPa</td>
<td>0 abs</td>
<td>100 kPa</td>
</tr>
<tr>
<td></td>
<td>100 bar</td>
<td>1 bar</td>
<td>14.5 psi</td>
</tr>
<tr>
<td></td>
<td>1450 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>41000 kPa</td>
<td>0 abs</td>
<td>410 kPa</td>
</tr>
<tr>
<td></td>
<td>410 bar</td>
<td>4.1 bar</td>
<td>59.5 psi</td>
</tr>
<tr>
<td></td>
<td>5945 psi</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Span limits

Maximum span = URL = upper range limit
(with the flow measurement shut off, can be adjusted up to ± URL
within the measurement span.
Example: -400 ... +400 mbar)

In order to optimize performance characteristics, it is recommended to select the transmitter sensor providing the lowest turndown ratio.

Zero suppression and elevation

No suppression or elevation, but zero-based range if:
- calibrated span ≥ minimum span

Process temperature range

-50 °C to +650 °C (-58 °F to 1200 °F) with external four-wire RTD.

Damping

Adjustable time constant: 0 to 60 sec
This is in addition to sensor response time.

Warm-up period

Operation within specifications: ≤ 2.5 sec with minimal damping

Insulation resistance

> 100 MΩ at 1000 V DC (between terminals and ground)
Operating limits

Temperature limits °C (°F):

Ambient (operating temperature)

- Transmitter: -40 °C to +85 °C (-40 °F and +185 °F)
- LCD display: -20 °C to +70 °C (-4 °F and +158 °F)

Lower operating temperature for Viton and PTFE gaskets: -20 °C (-4 °F)

Note: For hazardous atmosphere applications, see the temperature range specified on the relevant certificate/approval.

Process

Lower limit
- Refer to the lower ambient temperature limits

Upper limit:
- Silicone oil: 120 °C (248 °F) for operating pressures ≥ 10 kPa abs, 100 mbar abs, 1.45 psia (1)
- Carbon fluoride: 120 °C (248 °F) for operating pressures ≥ atmospheric pressure (2)

(1) 85 °C (185 °F) for applications below 10 kPa abs, 100 mbar abs, 1.45 psia to 3.5 kPa abs, 35 mbar abs, 0.5 psia
(2) 85 °C (185 °F) for applications below atmospheric pressure up to 40 kPa abs, 400 mbar abs, 5.8 psia

Storage

Lower limit: -50 °C (-58 °F), -40 °C (-40 °F) for LCD displays
Upper limit: +85 °C (+185 °F)

Pressure limits

Overpressure limits (without damage to the transmitter)

Lower limit
- 0.5 kPa abs, 5 mbar abs, 0.07 psia for silicone oil
- 40 kPa abs, 400 mbar abs, 5.8 psia for carbon fluoride

Upper limit:
- 0.6 MPa, 6 bar, 87 psi for differential pressure sensor code A
- 2 MPa, 20 bar, 290 psi or 10 MPa, 100 bar, 1450 psi or 41 MPa, 410 bar, 5945 psi depending upon the selected code variant for sensor code C, F, L, N

Static pressure

The 267C/269C transmitter for mass/standard volume flow operates within specifications with the following limits:

Lower limit
- 3.5 kPa abs, 35 mbar abs, 0.5 psia for silicone oil
- 40 kPa abs, 400 mbar abs, 5.8 psia for carbon fluoride

Upper limit:
- 0.6 MPa, 6 bar, 87 psi for differential pressure sensor code A
- 2 MPa, 20 bar, 290 psi or 10 MPa, 100 bar, 1450 psi or 41 MPa, 410 bar, 5945 psi depending upon the selected code variant for sensor code C, F, L, N

Test pressure

For pressure testing purposes, the transmitter can withstand a pressure test applied simultaneously from both sides of up to 1.5 times the static pressure range of the transmitter.

Environmental limits

Electromagnetic compatibility (EMC)

Definition: Class 3
RFI suppression: Limit Class B
(according to EN 550011)
Meets NAMUR recommendations

Low voltage directive:
Meets 73/23/EC

Pressure equipment directive (PED)

Instruments with maximum working pressure 41 MPa, 410 bar, 5945 psi comply with 97/23/EC Category III module H.

Humidity

Relative humidity: up to 100%
Condensation, icing: permitted

Vibration resistance

Acceleration up to 2 g at frequencies up to 1000 Hz
(according to IEC 60068-2-26)

Shock resistance (according to IEC 60068-2-27)

Acceleration: 50 g
Duration: 11 ms

Wet and dust-laden atmospheres (protection type)

The transmitter is dust and sand-tight and protected against immersion effects as defined by IEC EN60529 (1989) to IP 67 (IP 68 on request) or by NEMA to 4X or by JIS to C0920.

Protection type with plugged connection: IP 65

Hazardous atmospheres

Transmitter of protection type "Intrinsically safe EEx ia" according to Directive 94/9/EC (ATEX)

For applications in explosive areas, the connected RTD must also have the respective Ex protection class as the transmitter.

Transmitter with 4 to 20 mA output signal and HART communication

Identification: II 1/2 GD T 50 °C EEx ia IIC T6
II 1/2 GD T 95 °C EEx ia IIC T4

Power supply and signal circuit with protection type Intrinsic Safety EEx ib IIB/IIC or EEx ia IIB/IIC for connection to supply units with maximum values:

II 1/2 GD T 50 °C EEx ia or ib IIC T6
II 1/2 GD T 95 °C EEx ia or ib IIC T4

For temperature class T4:

- U_i = 30 V
- I_i = 200 mA
- P_i = 0.8 W for T4 where Ta = -40 °C to +85 °C (-40 ° F to +185 °F)
- P_i = 1.0 W for T4 where Ta = -40 °C to +70 °C (-40 °F to +158 °F)

For temperature class T6:

- P_i = 0.7 W for T4 where Ta = -40 °C to +40 °C (-40 °F to +104 °F)

Effective internal capacitance: C_i ≤ 10 nF
Effective internal inductance: L_i = 0
Series 2600T Pressure Transmitters  
Model 267CS/269CS Multivariable

Fieldbus transmitters (PROFIBUS PA / FOUNDATION fieldbus)
Identification:  
II 1/2 GD T 50 °C EEx ia IIC T6  
II 1/2 GD T 95 °C EEx ia IIC T4

Power supply and signal circuit with protection type Intrinsic Safety EEx ia IIB/IIC or EEx ia IIB/IIC for connection to supply units with maximum values:

- II 1/2 GD T 50 °C EEx ia or IIB T 6  
  \( U_i = 17.5 \text{ V} \)  
  \( I_i = 360 \text{ mA} \)  
  \( P_i = 2.52 \text{ W} \)

- II 1/2 GD T 50 °C EEx ia or IIB T 6  
  \( U_i = 17.5 \text{ V} \)  
  \( I_i = 380 \text{ mA} \)  
  \( P_i = 5.32 \text{ W} \)

- II 1/2 GD T 50 °C EEx ia or IIB T 6  
  \( U_i = 24 \text{ V} \)  
  \( I_i = 250 \text{ mA} \)  
  \( P_i = 1.2 \text{ W} \)

or connection to supply units or barriers with linear characteristics:

Maximum values:

- II 1/2 GD T 50 °C EEx ia or IIC T 6  
  \( U_i = 24 \text{ V} \)  
  \( I_i = 250 \text{ mA} \)  
  \( P_i = 1.2 \text{ W} \)

Effective internal inductance: \( L_i \leq 10 \mu\text{H} \),  
Effective internal capacitance: \( C_i \approx 0 \)

Maximum permissible ambient temperatures depending on the temperature class:

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>ambient temperature lower limit</th>
<th>ambient temperature upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>T4</td>
<td>-40 °C (-40 °F)</td>
<td>+85 °C (+185 °F)</td>
</tr>
<tr>
<td>T5, T6</td>
<td>-40 °C (-40 °F)</td>
<td>+104 °C (+200 °F)</td>
</tr>
</tbody>
</table>

Transmitter of category 3 for the application in "Zone 2" according to Directive 94/9/EC (ATEX)

Transmitter with 4 to 20 mA output signal and HART communication
Identification:  
II 3 GD T 50 °C EEx nL IIC T6  
II 3 GD T 95 °C EEx nL IIC T4

Operating conditions:
Supply and signal circuit  
(terminal signal ±): \( U \leq 45 \text{ V} \)  
\( I \leq 22.5 \text{ mA} \)

Connector for passive external temperature sensor:
Supply and signal circuit  
(terminal signal ±): \( U \leq 10.6 \text{ V} \)  
\( I \leq 1.5 \text{ mA} \)  
\( P \leq 4 \text{ mW} \)

Ambient temperature range:
Temperat. class T4  
\( \text{Ta} = -40 \degree \text{C to } +85 \degree \text{C} (-40 \degree \text{F to } +185 \degree \text{F}) \)
Temperat. class T5 and T6  
\( \text{Ta} = -40 \degree \text{C to } +40 \degree \text{C} (-40 \degree \text{F to } +104 \degree \text{F}) \)

Transmitter of protection type "Intrinsically safe EEx ia" according to Directive 94/9/EC (ATEX), or

Transmitter of protection type "Intrinsically safe EEx ia" according to Directive 94/9/EC (ATEX), or

Transmitter of protection type "flameproof enclosure EEx d" according to Directive 94/9/EC (ATEX), or

Transmitter of protection type "limited energy equipment EEx nL" according to Directive 94/9/EC (ATEX) (alternate certification)

Factory Mutual (FM)

Transmitter with 4 to 20 mA output signal and HART communication
Identification:
II 1/2 GD T 50 °C EEx ia IIC T6
II 1/2 GD T 95 °C EEx ia IIC T4;
(refer to "EEx ia" for additional data)

Identification:
II 1/2 GD T 85 °C EEx d IIC T6

Ambient temperature range:
\(-40 \degree \text{C to } +75 \degree \text{C} (-40 \degree \text{F to } +167 \degree \text{F}) \)

Identification:
II 3 GD T 50 °C EEx nL IIC T6
II 3 GD T 85 °C EEx nL IIC T4
(refer to "EEx nL" for additional data)

Canadian standard (CSA)

Transmitter with 4 to 20 mA output signal and HART communication
Identification:  
II 1/2 GD T 50 °C EEx ia IIC T6
II 1/2 GD T 95 °C EEx ia IIC T4;
(refer to "EEx ia" for additional data)

Identification:  
II 1/2 GD T 85 °C EEx d IIC T6

Ambient temperature range:
\(-40 \degree \text{C to } +75 \degree \text{C} (-40 \degree \text{F to } +167 \degree \text{F}) \)

Identification:  
II 3 GD T 50 °C EEx nL IIC T6
II 3 GD T 85 °C EEx nL IIC T4
(refer to "EEx nL" for additional data)

Factory Mutual (FM)

Transmitter with 4 to 20 mA output signal and HART communication
Identification:
II 3 GD T 50 °C EEx nL IIC T6
II 3 GD T 85 °C EEx nL IIC T4
(refer to "EEx nL" for additional data)

Maximum permissible ambient temperatures depending on the temperature class:

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Temperature class</th>
<th>( I_{\text{max}} )</th>
<th>( P_i )</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-40 \degree \text{C to } +85 \degree \text{C} (-40 \degree \text{F to } +185 \degree \text{F}) )</td>
<td>T4</td>
<td>200 mA</td>
<td>0.8 W</td>
</tr>
<tr>
<td>(-40 \degree \text{C to } +70 \degree \text{C} (-40 \degree \text{F to } +158 \degree \text{F}) )</td>
<td>T5</td>
<td>25 mA</td>
<td>0.75 W</td>
</tr>
<tr>
<td>(-40 \degree \text{C to } +40 \degree \text{C} (-40 \degree \text{F to } +104 \degree \text{F}) )</td>
<td>T6</td>
<td>25 mA</td>
<td>0.5 W</td>
</tr>
</tbody>
</table>

Fieldbus transmitters (PROFIBUS PA / FOUNDATION fieldbus)

Intrinsically Safe:  
Class I, II, and III; Division 1;  
Groups A, B, C, D, E, F, G;  
Class I; Zone 0; AEx ia Group IIC T6, T4;  
Non-incendive Class I, II, and III, Division 2;  
Groups A, B, C, D, E, F, G

Degree of protection: NEMA Type 4X (indoor or outdoor)

Transmitter with 4 to 20 mA output signal and HART communication
Identification:  
II 1/2 GD T 50 °C EEx ia IIC T6
II 1/2 GD T 95 °C EEx ia IIC T4;
(refer to "EEx ia" for additional data)

Identification:  
II 1/2 GD T 85 °C EEx d IIC T6

Ambient temperature range:
\(-40 \degree \text{C to } +75 \degree \text{C} (-40 \degree \text{F to } +167 \degree \text{F}) \)

Identification:  
II 3 GD T 50 °C EEx nL IIC T6
II 3 GD T 85 °C EEx nL IIC T4
(refer to "EEx nL" for additional data)

Canadian standard (CSA)

Transmitter with 4 to 20 mA output signal and HART communication
Identification:  
II 1/2 GD T 50 °C EEx ia IIC T6
II 1/2 GD T 95 °C EEx ia IIC T4;
(refer to "EEx ia" for additional data)

Identification:  
II 1/2 GD T 85 °C EEx d IIC T6

Ambient temperature range:
\(-40 \degree \text{C to } +75 \degree \text{C} (-40 \degree \text{F to } +167 \degree \text{F}) \)

Identification:  
II 3 GD T 50 °C EEx nL IIC T6
II 3 GD T 85 °C EEx nL IIC T4
(refer to "EEx nL" for additional data)
Series 2600T Pressure Transmitters
Model 267CS/269CS Multivariable

Standards Association of Australia (SAA)

Transmitter of protection type "Intrinsically safe Ex ia" and "Non-sparking material" Ex n

- Transmitter with 4 to 20 mA output signal and HART communication
- Identification: Ex ia IIC T4 (P = 0.8 W Ta = 85 °C) / T6 (P = 0.7 W Ta = 40 °C)
- Ex n IIC T4 (Ta = 85 °C) / T6 (Ta = 40 °C)
- IP 66

Intrinsically safe installation input parameters:
- \( U_i = 30 \text{ V} \)
- \( I_i = 200 \text{ mA} \)
- \( P_i = 0.8 \text{ W for T4 where Ta = +85 °C (+185 °F)} \) or
- \( P_i = 0.7 \text{ W for T4 where Ta = +40 °C (+104 °F)} \)

Effective internal capacitance: \( C_i = 52 \text{ nF} \)
Effective internal inductance: \( L_i \approx 0 \text{ mH} \)

Ex n installation input parameters:
- \( U_i = 30 \text{ V} \)

Transmitter with protection type "flameproof enclosure Ex d"

- Transmitter with 4 to 20 mA output signal and HART communication
- Identification: Ex d IIC T6 (Tamb +75 °C) IP66/IP67
- Zone A21: Ex tD A21 T85 (Tamb +75 °C) IP66/IP67

Electrical Data and Options

HART digital communication and 4 to 20 mA output

Power supply
- The transmitter operates from 10.5 to 45 V DC with no load and is protected against reverse polarity connection (additional load allows operations over 45 V DC).
- Minimum power supply is 14 V DC with backlit display.
- For Ex ia and other intrinsically safe approval power supply must not exceed 30 V DC.

Ripple
- Maximum permissible voltage ripple of power supply during communication:
  - 7 Vss at \( f = 50 \) to 100 Hz
  - 1 Vss at \( f = 100 \) to 200 Hz
  - 0.2 Vss at \( f = 200 \) to 300 Hz

Load limitations
- Total loop resistance at 4 to 20 mA and HART:
  \[ R_{(4-20\text{~mA})} = \frac{\text{Supply voltage} - \text{minimum operating voltage (V DC)}}{22.5 \text{ mA}} \]
- A minimum of 250 Ω is required for HART communication.

LCD display (optional)
- 19-segment alphanumeric display (2-line, 6-character) with additional bar chart display, optionally with back illumination.
- User-specific display:
  - Output current in percent
  - Output current in mA
  - Freely-selectable process variable
- Diagnostic messages, alarms, measuring range infringements and changes to the configuration are also displayed.

Output signal
- Two-wire 4 to 20 mA, related to mass / standard volume flow, full compensation of all pressure (p) and temperature (T) effects.
- HART® communication provides digital process variables (% mA or engineering units) superimposed on the 4 to 20 mA signal (protocol according to Bell 202 FSK standard).

Output function
- Mass / standard volume flow calculations are performed according to the following:
  \[ Q_m = \frac{C \cdot E_v \cdot Y_1 \cdot \frac{d^2}{dp} \cdot \rho}{\rho_n} \]  
  For steam/fluid
  \[ Q_n = \frac{C \cdot E_v \cdot Y_1 \cdot \frac{d^2}{dp} \cdot \rho}{\rho_n} - \frac{1}{\rho_n} \]  
  For gas

where:
- \( Q_m \) = mass flowrate
- \( Q_n \) = standard flowrate
- \( C \) = discharge coefficient
- \( E_v \) = velocity of approach factor
- \( Y_1 \) = gas expansion factor
- \( d \) = bore diameter
- \( dp \) = differential pressure
- \( \rho \) = fluid density
- \( \rho_n \) = standard density

Output current limits (according to NAMUR standard)
- Overload condition
  - Lower limit: 3.8 mA (configurable down to 3.6 mA)
  - Upper limit: 20.5 mA (configurable up to 22.5 mA)

Alarm current
- Minimum alarm current: configurable from 3.6 to 4 mA.
- Maximum alarm current: configurable from 20 to 22.5 mA.
- Standard setting: maximum alarm current

SIL – functional safety (optional) according to IEC 61508/61511
- Device with certificate of conformity for use in safety-relevant applications, including SIL 2.
### PROFIBUS PA output

**Type of appliance**
Pressure transmitter in conformance with Profile 3.0, Class A and B; ID number 062D HEX

**Power supply**
The transmitter is driven with 10.2 to 32 V DC (no polarity). The power supply must not exceed 17.5 V DC when used in EEx ia zones. Intrinsic safety installation according to FISCO model.

**Current consumption**
- Operating (quiescent): 11.7 mA
- Fault current limiting: 17.3 mA max.

**Output signal**

**Output interface**
PROFIBUS PA communication according to PROFIBUS DP50170 Part 2/DIN 19245 Part 1-3

**Output cycle time**
100 ms

**Function blocks**
- 3 standard analog input function blocks
- 2 transducer blocks
- 1 multi variable function block
- 1 physical block

**LCD display (optional)**
- 19-segment alphanumeric display (2-line, 6-character) with additional bar chart display, optionally with back illumination
- Output value in percent or OUT (input flow)
- Diagnostic messages, alarms, measuring range infringements and changes to the configuration are also displayed

**Transmitter failure mode**
Permanent self-diagnostic; possible errors indicated in diagnostic parameters and in the status of process values.

### FOUNDATION fieldbus output

**Power supply**
The transmitter is driven with 10.2 to 32 V DC (no polarity). The power supply must not exceed 17.5 V DC when used in EEx ia zones. Intrinsic safety installation according to FISCO model.

**Current consumption**
- Operating (quiescent): 11.7 mA
- Fault current limiting: 17.3 mA max.

**Output signal**

**Function blocks/execution time**
- 3 standard analog input function blocks (each 80 ms)
- 1 multi variable function block (100 ms)
- 1 standard PID function block (100 ms)

**Additional blocks**
- 1 custom pressure with calibration transducer block
- 1 standard resource block
- 1 custom temperature with calibration transducer block

**Number of link objects**
10

**Number of VCRs**
16

**Output interface**
FOUNDATION fieldbus digital communication protocol to standard H1, compliant with specification V. 1.5; FF registration No. IT023700.

**LCD display (optional)**
- 19-segment alphanumeric display (2-line, 6-character) with additional bar chart display, optionally with back illumination
- User-specific display:
  - Output value in percent or OUT (input flow)
  - Diagnostic messages, alarms, measuring range infringements and changes to the configuration are also displayed

**Transmitter failure mode**
Permanent self-diagnostic; possible errors indicated in diagnostic parameters and in the status of process values.
Series 2600T Pressure Transmitters
Model 267CS/269CS Multivariable

Measuring accuracy
Reference conditions according to IEC 60770 apply: ambient temperature of 20 °C (68 °F), relative humidity of 65 %, atmospheric pressure of 1013 hPa (1013 mbar), mounting position with vertical diaphragm and zero-based range for transmitter with isolating diaphragms in Hastelloy and silicone oil fill. Measurement range with HART digital trim values equal to 4 to 20 mA span end points.

Unless otherwise specified, errors are quoted as % of span.

The accuracy related to the Upper Range Limits (URL) is affected by the actual turndown (TD) as a ratio between Upper Range Limit (URL) and calibrated span (URL/span).

In order to optimize performance characteristics, it is recommended to select the transmitter sensor providing the lowest turndown ratio.

Dynamic behavior (according to IEC 61298-1)
Devices with standard configuration and turndown to 30:1
- Dead time: 30 ms
- Time constant (63.2 % of total step change)
  - Sensors F to N: 150 ms
  - Sensor C: 400 ms
  - Sensor A: 1000 ms

Accuracy rating
Percentage of calibrated span including combined effects of linearity, hysteresis and reproducibility.

For fieldbus versions SPAN refers to analog input function block oustcale range.

Differential pressure sensor
267CS
- ± 0.075 % for turndown from 1:1 to 10:1
- \( \pm \left( 0.075 + 0.005 \times \frac{URL}{Span} - 0.05 \right) \% \) For turndown greater than 10:1

269CS
- ± 0.04 % for turndown from 1:1 to 10:1
- \( \pm \left( 0.04 + 0.005 \times \frac{URL}{Span} - 0.05 \right) \% \) For turndown greater than 10:1

Absolute pressure sensor
0.1 % of the URL of the absolute pressure sensor

Process temperature measurement (Pt 100)
± 0.3 °C (0.54 °F)

The accuracy of the mass or standard volume flow is not only influenced by the accuracy of the dp, p and T measurement; rather it depends upon the primary device used (discharge coefficient), the pressure and temperature range to be compensated, as well as other parameters.

Typical applications reflect an accuracy of 0.7 % to 0.9 %.

Operating influences
Ambient temperature
(turndown to 15:1)
Per 20 K change between the limits of
-20 °C to +65 °C (-4 °F to +149 °F)

Differential pressure sensor
267CS
\( \pm \left( 0.04 \% \right. \text{URL} + 0.065 \% \text{span} \)

269CS
\( \pm \left( 0.03 \% \right. \text{URL} + 0.05 \% \text{span} \)

Absolute pressure sensor
\( \pm \left( 0.08 \% \right. \text{URL} + 0.08 \% \text{span} \)
Limited to \( \pm \left( 0.1 \% \right. \text{URL} + 0.1 \% \text{span} \) per the complete temperature range of 120 K (216 °F)

Static pressure
(zero errors can be calibrated out at line pressure)

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>Sensor A</th>
<th>Sensors C, F, L, N</th>
</tr>
</thead>
<tbody>
<tr>
<td>On zero</td>
<td>to 2 bar: 0.05 % URL</td>
<td>to 100 bar: 0.05 % URL</td>
</tr>
<tr>
<td></td>
<td>&gt; 2 bar: 0.05 % URL/bar</td>
<td>&gt; 100 bar: 0.05 % URL/100 bar</td>
</tr>
<tr>
<td>On span</td>
<td>to 2 bar: 0.05 % span</td>
<td>to 100 bar: 0.05 % span</td>
</tr>
<tr>
<td></td>
<td>&gt; 2 bar: 0.05 % span/bar</td>
<td>&gt; 100 bar: 0.05 % span/100 bar</td>
</tr>
</tbody>
</table>

Power supply
Within the specified limits for the voltage/load the total influence is less than 0.001 % of URL per volt.

Load
Within the specified load/voltage limits, the total effect is negligible.

Electromagnetic fields
Total effect: less than 0.05 % of span from 80 to 1000 MHz and for field strengths up to 10 V/m when tested with unshielded conduit, with or without meter.

Common-mode interference
No effect from 250 Veff (50 Hz) or 50 V DC

Installation position
Rotations in the plane of the transmitter diaphragm have negligible effect. A tilt from vertical causes a zero shift of \( \sin \alpha \times 0.35 \text{kPa} \) (3.5 mbar, 1.4 in H₂O) of URL which can be corrected with the zero adjustment. No effect on the span.

Stability
\( \pm 0.15 \% \) of URL over a sixty-month period

Vibration effect
\( \pm 0.10 \% \) of URL (according to IEC 61298-3)
Series 2600T Pressure Transmitters
Model 267CS/269CS Multivariable

Technical Specification
(Refer to ordering information sheets for variant availability related to the specific model)

Materials

Process isolating diaphragms
- Hastelloy C276™ stainless steel (1.4435); Monel 400™, Tantalum

Process flange, adapter, plugs and drain/vent valves
- Hastelloy C276™ stainless steel (1.4404); Monel 400™; Kynar (PVDF)

Sensor fill fluid
- Silicone oil, inert fill (carbon fluoride)

Sensor housing
- Stainless steel

Mounting bracket
- Stainless steel

Gaskets
- Viton™ (FPM), Perbunan (NBR), EPDM, PTFE (for sensor C, F, L, N) or FEP coated Viton™ (for sensor A)

Bolts and nuts
- Stainless steel, bolts and nuts Class A4-70 according to ISO 3506, conforming to NACE MR0175 Class II

Electronics housing and cover
- Barrel version
  - Aluminum alloy with low copper content, baked epoxy finish
  - Stainless steel

- DIN version
  - Aluminum alloy with low copper content, baked epoxy finish

Covers O-ring
- Viton™

Local control keys
- Fiberglass-reinforced polycarbonate plastic (removable), no local control keys for stainless steel housings.

Type plate
- Stainless steel (316) or plastic data plate attached to the electronics housing

Calibration
- Standard: at maximum span, zero-based range, ambient temperature and pressure
- Optional: at specified range and ambient conditions

Optional accessories

Mounting bracket
- For vertical and horizontal 60 mm (2 in) pipes or wall mounting

LCD display
- Plug-in and rotatable

Additional tag plate
- Tag with wire (both stainless steel) attached to the transmitter, with a maximum of 30 characters including spaces.

Cleanliness level for oxygen application

Preparation for hydrogen application

Certificates (test, model, calibration, material traceability)

Process connections
- Flange: ¼-18 NPT on the process axis, selectable with fixing threads 7/16-20 UNF or DIN 19213 connection with M10 threading for operating pressures up to 10 MPa, 100 bar, 1450 psi or M12 threading for higher operating pressures up to 41 MPa, 410 bar, 5945 psi
- Adapter: ½-14 NPT on process axis
- Center distance between flanges: 54 mm (2.13 in); 51, 54 or 57 mm (2.01, 2.13 or 2.24 in) as per adapter fittings

Electrical connections
- Two ½-14 NPT or M20 x 1.5 threaded bores for cable glands, direct on housing, or plug connector
- HART: straight or angle Harting Han connector and one plug
- FOUNDATION fieldbus/PROFIBUS PA: plug 7/8 in / M12 x 1

Terminal blocks
- HART version: four terminals for signal/external display plus four terminals for RTD connection wiring up to 2.5 mm² (14 AWG) and four connection points for test and communication purposes.
- Fieldbus versions: two terminals for signal (bus connection) plus four terminals for RTD connection wiring up to 2.5 mm² (14 AWG)

Ground
- Internal and external 4 mm² (12 AWG) ground termination points are provided.

Installation position
- The transmitter can be mounted in any position.
- The electronics housing may be rotated 360°. A positive stop prevents over-travel.

Weight (without options)
- Approximately 3.5 kg (8 lb), add 1.5 kg (3.4 lb) for stainless steel housing. Packaging adds 650 g

Packaging
- Carton approx. 230 x 250 x 270 mm (9 x 10 x 11 in)

™ Hastelloy is a Cabot Corporation trademark
™ Monel is an International Nickel Co. trademark
™ Viton is a DuPont de Nemours trademark

1) Wetted transmitter parts
### Configuration

#### Transmitter with HART communication and 4 to 20 mA output current

**Standard configuration**

Transmitters are factory calibrated to the customer’s specified range. Calibrated range and measuring point number are stamped on the type plate. If this data has not been specified, the transmitter will be delivered configured as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 mA Zero point</td>
<td></td>
</tr>
<tr>
<td>20 mA Upper range limit (URL)</td>
<td></td>
</tr>
<tr>
<td>Damping</td>
<td>0.125 sec</td>
</tr>
<tr>
<td>Transmitter failure mode</td>
<td>21 mA</td>
</tr>
<tr>
<td>Optional LCD display</td>
<td>Specified flow</td>
</tr>
</tbody>
</table>

Any or all the above configurable parameters, including lower range value and upper range value can be easily changed by a PC running the configuration software SMART VISION with DTM MV2600. Data regarding flange type and material, O-rings and filling liquid is stored in the device.

#### Transmitter with PROFIBUS PA communication

Transmitters are factory calibrated to the customer’s specified range. Calibrated range and measuring point number are stamped on the type plate. If this data has not been specified, the transmitter will be delivered configured as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure profile</td>
<td>Pressure</td>
</tr>
<tr>
<td>Engineering unit</td>
<td>mbar/bar</td>
</tr>
<tr>
<td>Output scale 0 %</td>
<td>Lower range limit (LRL)</td>
</tr>
<tr>
<td>Output scale 100 %</td>
<td>Upper range limit (URL)</td>
</tr>
<tr>
<td>Output</td>
<td>Square root</td>
</tr>
<tr>
<td>Upper alarm limit</td>
<td>Upper range limit (URL)</td>
</tr>
<tr>
<td>Upper warning limit</td>
<td>Upper range limit (URL)</td>
</tr>
<tr>
<td>Lower warning limit</td>
<td>Lower range limit (LRL)</td>
</tr>
<tr>
<td>Lower alarm limit</td>
<td>Lower range limit (LRL)</td>
</tr>
<tr>
<td>Limit hysteresis</td>
<td>0.5 % of output scale</td>
</tr>
<tr>
<td>PV filter</td>
<td>0.125 sec</td>
</tr>
<tr>
<td>Address</td>
<td>not required</td>
</tr>
</tbody>
</table>

Any or all the above configurable parameters, including lower range value and upper range value can be changed by any FOUNDATION fieldbus-compatible configurator. The device-specific DMA is required for changing the flow measurement. Data regarding flange type and material, O-rings and filling liquid is stored in the device.

### Transmitter with FOUNDATION fieldbus communication

Transmitters are factory calibrated to the customer’s specified range. Calibrated range and measuring point number are stamped on the type plate. If this data has not been specified, the transmitter will be delivered configured as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure profile</td>
<td>Pressure</td>
</tr>
<tr>
<td>Engineering unit</td>
<td>mbar/bar</td>
</tr>
<tr>
<td>Output scale 0 %</td>
<td>Lower range limit (LRL)</td>
</tr>
<tr>
<td>Output scale 100 %</td>
<td>Upper range limit (URL)</td>
</tr>
<tr>
<td>Output</td>
<td>Square root</td>
</tr>
<tr>
<td>Upper alarm limit</td>
<td>Upper range limit (URL)</td>
</tr>
<tr>
<td>Upper warning limit</td>
<td>Upper range limit (URL)</td>
</tr>
<tr>
<td>Lower warning limit</td>
<td>Lower range limit (LRL)</td>
</tr>
<tr>
<td>Lower alarm limit</td>
<td>Lower range limit (LRL)</td>
</tr>
<tr>
<td>Limit hysteresis</td>
<td>0.5 % of output scale</td>
</tr>
<tr>
<td>PV filter</td>
<td>0.125 sec</td>
</tr>
<tr>
<td>Address</td>
<td>not required</td>
</tr>
</tbody>
</table>

Any or all the above configurable parameters, including lower range value and upper range value can be easily changed by a PC running the configuration software SMART VISION with DTM MV2600. Data regarding flange type and material, O-rings and filling liquid is stored in the device.
Mounting Dimensions (not design data)

Transmitter with barrel housing

Deviations in the drawing are possible. Measurements in mm (inches)
Transmitter with DIN housing

Deviations in the drawing are possible. Measurements in mm (inches)

- Space must be available to rotate the keyboard cover.
- Additional tag plate, e.g., for indicating measuring points (optional).
- Housing rotating stop-screw.
- Captive screw for keyboard cover.
- Transducer plate.
- Process connection.
- Threads for fixing screws (see process flange data).
- Type plate.
- Electrical connection.
- Terminal side.
- Pt 100 connection.
- Housing cover.
- Clearance for cover removal required.
Mounting options with bracket

Deviations in the drawing are possible. Measurements in mm (inches)
Electrical connections

Standard terminal block

Fieldbus plug connector

<table>
<thead>
<tr>
<th>Number</th>
<th>FOUNDATION Fieldbus</th>
<th>PROFIBUS PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FF-</td>
<td>PA+</td>
</tr>
<tr>
<td>2</td>
<td>FF+</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Shield</td>
<td>PA shield</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
<td></td>
</tr>
</tbody>
</table>

Mating plug (socket) not supplied

Harting Han 8D (8U) connector
### Ordering Information

<table>
<thead>
<tr>
<th>Multivariable transmitter, for mass flow</th>
<th>Variant digit No.</th>
<th>Catalog No.</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>267CS - Base accuracy: 0.075 %</td>
<td>1-6</td>
<td>267CS-</td>
<td></td>
</tr>
<tr>
<td>269CS - Base accuracy: 0.04 %</td>
<td>8-11</td>
<td>269CS-</td>
<td></td>
</tr>
</tbody>
</table>

#### Sensor - Span limits

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Span Limits</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kPa</td>
<td>10 mbar</td>
<td>A</td>
</tr>
<tr>
<td>6 kPa</td>
<td>60 mbar</td>
<td>C</td>
</tr>
<tr>
<td>40 kPa</td>
<td>400 mbar</td>
<td>F</td>
</tr>
<tr>
<td>250 kPa</td>
<td>2500 mbar</td>
<td>L</td>
</tr>
<tr>
<td>2000 kPa</td>
<td>20 bar</td>
<td>N</td>
</tr>
<tr>
<td>100 kPa</td>
<td>1000 mbar</td>
<td>Y</td>
</tr>
</tbody>
</table>

#### Static pressure

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Span Limits</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 0.6 MPa</td>
<td>0 ... 6 bar</td>
<td>1) 1</td>
</tr>
<tr>
<td>0 ... 2 MPa</td>
<td>0 ... 20 bar</td>
<td>2) 2</td>
</tr>
<tr>
<td>0 ... 10 MPa</td>
<td>0 ... 100 bar</td>
<td>2) 3</td>
</tr>
<tr>
<td>0 ... 41 MPa</td>
<td>0 ... 410 bar</td>
<td>2) 4</td>
</tr>
</tbody>
</table>

#### Diaphragm material / Fill fluid

<table>
<thead>
<tr>
<th>Material</th>
<th>Fill fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>AISI 316L SST (1.4435)</td>
<td>Silicone oil</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>Silicone oil</td>
</tr>
<tr>
<td>Monel 400</td>
<td>Silicone oil</td>
</tr>
<tr>
<td>Monel 400 gold plated</td>
<td>Silicone oil</td>
</tr>
<tr>
<td>Tantalum</td>
<td>Silicone oil</td>
</tr>
<tr>
<td>AISI 316L SST (1.4435)</td>
<td>Inert fluid</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>Inert fluid</td>
</tr>
<tr>
<td>Monel 400</td>
<td>Inert fluid</td>
</tr>
<tr>
<td>Monel 400 gold plated</td>
<td>Inert fluid</td>
</tr>
<tr>
<td>Tantalum</td>
<td>Inert fluid</td>
</tr>
</tbody>
</table>

#### Process connection material / Process connection

<table>
<thead>
<tr>
<th>Material</th>
<th>Process Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>AISI 316L SST (1.4404 / 1.4408)</td>
<td>1/4-18 NPT-f direct</td>
</tr>
<tr>
<td>AISI 316L SST (1.4404 / 1.4408)</td>
<td>1/4-18 NPT-f direct (DIN 19213)</td>
</tr>
<tr>
<td>AISI 316L SST (1.4404 / 1.4408)</td>
<td>1/2-14 NPT-f through adapter</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>1/4-18 NPT-f direct</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>1/4-18 NPT-f direct (DIN 19213)</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>1/2-14 NPT-f through adapter</td>
</tr>
<tr>
<td>Monel 400</td>
<td>1/4-18 NPT-f direct</td>
</tr>
<tr>
<td>Monel 400</td>
<td>1/4-18 NPT-f direct (DIN 19213)</td>
</tr>
<tr>
<td>Monel 400</td>
<td>1/2-14 NPT-f through adapter</td>
</tr>
<tr>
<td>Kynar (PVDF)</td>
<td>(axial) 1/4-18 NPT-f direct (max. 1 MPa)</td>
</tr>
<tr>
<td>AISI 316L SST (1.4404 / 1.4408)</td>
<td>(vertical) 1/4-18 NPT-f direct</td>
</tr>
</tbody>
</table>

#### Bolts / Gaskets

<table>
<thead>
<tr>
<th>Material</th>
<th>Process Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>AISI 316L SST (NACE - non exposed)</td>
<td>Viton</td>
</tr>
<tr>
<td>AISI 316L SST (NACE - non exposed)</td>
<td>PTFE (Max. 10 MPa)</td>
</tr>
<tr>
<td>AISI 316L SST (NACE - non exposed)</td>
<td>EPDM</td>
</tr>
<tr>
<td>AISI 316L SST (NACE - non exposed)</td>
<td>Perbunan</td>
</tr>
<tr>
<td>AISI 316L SST</td>
<td>FEP (Only available with Kynar [PVDF] process connection)</td>
</tr>
</tbody>
</table>

1) Only with Sensor code A
2) Not with sensor code A
3) Suitable for oxygen applications
4) Suitable for oxygen applications / Not with Process Connection Kynar (PVDF)
5) Not with Process Connection Kynar (PVDF)
### Ordering Information, continued

<table>
<thead>
<tr>
<th>Multivariable transmitter, for mass flow</th>
<th>Variant digit No.</th>
<th>1-6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>267CS</strong></td>
<td>Base accuracy: 0.075 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>267CS-</td>
</tr>
<tr>
<td><strong>269CS</strong></td>
<td>Base accuracy: 0.04 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>269CS-</td>
</tr>
</tbody>
</table>

#### Electronic housing

<table>
<thead>
<tr>
<th>Material</th>
<th>Electrical connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium Alloy (Barrel type)</td>
<td>1/2-14 NPT</td>
</tr>
<tr>
<td>Aluminium Alloy (Barrel type)</td>
<td>M20 x 1.5</td>
</tr>
<tr>
<td>Aluminium Alloy (Barrel type)</td>
<td>Harting Han connector</td>
</tr>
<tr>
<td>Aluminium Alloy (Barrel type)</td>
<td>Fieldbus connector</td>
</tr>
<tr>
<td>AISI 316L SST (Barrel type)</td>
<td>1/2-14 NPT</td>
</tr>
<tr>
<td>AISI 316L SST (Barrel type)</td>
<td>M20 x 1.5</td>
</tr>
<tr>
<td>Aluminium Alloy (DIN type)</td>
<td>M20 x 1.5</td>
</tr>
<tr>
<td>Aluminium Alloy (DIN type)</td>
<td>Harting Han connector</td>
</tr>
<tr>
<td>Aluminium Alloy (DIN type)</td>
<td>Fieldbus connector</td>
</tr>
</tbody>
</table>

#### Output

<table>
<thead>
<tr>
<th>Output</th>
<th>Additional options</th>
</tr>
</thead>
<tbody>
<tr>
<td>HART digital communication and 4 ... 20 mA</td>
<td>(Additional options not requested)</td>
</tr>
<tr>
<td>PROFIBUS PA</td>
<td>(Additional options not requested)</td>
</tr>
<tr>
<td>FOUNDATION fieldbus</td>
<td>(Additional options not requested)</td>
</tr>
<tr>
<td>Modbus RS 485</td>
<td>(Additional options not requested)</td>
</tr>
<tr>
<td>Modbus RS 232</td>
<td>(Additional options not requested)</td>
</tr>
</tbody>
</table>

#### Additional Ordering Information

<table>
<thead>
<tr>
<th>Vent valve material / Position</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>AISI 316L SST (1.4404)</td>
<td>On process axis</td>
</tr>
<tr>
<td>AISI 316L SST (1.4404)</td>
<td>On flanges side top</td>
</tr>
<tr>
<td>AISI 316L SST (1.4404)</td>
<td>On flanges side bottom</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>On process axis</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>On flanges side top</td>
</tr>
<tr>
<td>Hastelloy C-276</td>
<td>On flanges side bottom</td>
</tr>
<tr>
<td>Monel 400</td>
<td>On process axis</td>
</tr>
<tr>
<td>Monel 400</td>
<td>On flanges side top</td>
</tr>
<tr>
<td>Monel 400</td>
<td>On flanges side bottom</td>
</tr>
</tbody>
</table>

---

6) Not available with FM, CSA  
7) Not available with EEx nL, EEx d, FM, CSA (select connector type with additional ordering code)  
8) Not available with EEx nL, EEx d, FM- / CSA- / NEPSI-Explosion Proof (select connector type with additional ordering code)  
9) Additional options to be ordered by additional ordering code  
10) Additional options not requested / Not available for electrical connection with connector

Continued on next page
## Additional ordering information

<table>
<thead>
<tr>
<th>267CS, 269CS</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explosion protection</strong></td>
<td></td>
</tr>
<tr>
<td>ATEX Group II Category 1/2 GD - Intrinsic Safety EEx ia</td>
<td>E1</td>
</tr>
<tr>
<td>ATEX Group II Category 1/2 G - Flameproof EEx d</td>
<td>E2</td>
</tr>
<tr>
<td>ATEX Group II Category 3 GD - Type of Protection N EEx nL Energy Limited</td>
<td>E3</td>
</tr>
<tr>
<td>IECEx ia Ga / Gb, IECEx iaD 20</td>
<td>E8</td>
</tr>
<tr>
<td>IECEx d</td>
<td>E9</td>
</tr>
<tr>
<td>ATEX II 1/2 GD EEx ia + ATEX II 1/2 GD EEx d + ATEX EEx nL</td>
<td>EW</td>
</tr>
<tr>
<td>Factory Mutual (FM) - Intrinsically Safe</td>
<td>EA</td>
</tr>
<tr>
<td>Factory Mutual (FM) - Explosion-proof</td>
<td>11 EB</td>
</tr>
<tr>
<td>Canadian Standard Association - Explosion Protection</td>
<td>EE</td>
</tr>
<tr>
<td>Canadian Standard Association - Explosion Protection (Canada &amp; USA)</td>
<td>EM</td>
</tr>
<tr>
<td>NEPSI Ex ia II C T4/T6</td>
<td>EY</td>
</tr>
<tr>
<td>NEPSI Ex d II C T6</td>
<td>EZ</td>
</tr>
<tr>
<td>GOST Russia - EEx ia</td>
<td>W1</td>
</tr>
<tr>
<td>GOST Russia - EEx d</td>
<td>W2</td>
</tr>
<tr>
<td>GOST Kazakhstan - EEx ia</td>
<td>W3</td>
</tr>
<tr>
<td>GOST Kazakhstan - EEx d</td>
<td>W4</td>
</tr>
<tr>
<td>GOST Ukraine - EEx ia</td>
<td>WA</td>
</tr>
<tr>
<td>GOST Ukraine - EEx d</td>
<td>WB</td>
</tr>
<tr>
<td>GOST Belarus - EEx ia</td>
<td>WG</td>
</tr>
<tr>
<td>GOST Belarus - EEx d</td>
<td>WL</td>
</tr>
<tr>
<td>SAA Ex d IIC T6 and Ex td A21 IP 66 T85 °C</td>
<td>X1</td>
</tr>
</tbody>
</table>

### Integrated digital display (LCD)

- With integrated LCD display: L1
- With integrated LCD display (backlit): L2

### Mounting bracket shape / Material

- For pipe mounting: AISI 304 SST (1.4301) B2
- For wall mounting: AISI 304 SST (1.4301) B4

### Operating manual

- German: M1
- French: M4
- English: M5
- Russian: MB

### Label and Tag Language

- German: Stainless steel 12 T1
- German and English: Plastic 13 TA

### Additional tag plate

- Stainless steel (laser printed): I1

### Applications

- Oil- and grease-free, for oxygen applications (O₂) 14 P1
  - (Pmax = 12 MPa / 120 bar / 1740 psi, Tmax = 60 °C / 140 °F)
- Hydrogen Application (H₂) (Fluid Film) P2

### Housing Accessories

- Integral mount manifold (Price adder just for assembling, not for manifold) A1
- Four-wire add-on unit: Power supply 24 V UC / Output signal 0 ... 20 mA A4
- Four-wire add-on unit: Power supply 24 V UC / Output signal 4 ... 20 mA A6
- Four-wire add-on unit: Power supply 230 V AC / Output signal 0 ... 20 mA A5
- Four-wire add-on unit: Power supply 230 V AC / Output signal 4 ... 20 mA A7
- Plug upside welded A8
- Plug bottom welded A9

---

11) Only with Electrical Connection 1/2-14 NPT and Stainless Steel Tag Plate
12) Not available with DIN Electronic Housing code J, K, W
13) Not available with Factory Mutual - Explosion Proof
14) Only available with inert fill and with Viton gasket

Continued on next page
## Additional Ordering Information

<table>
<thead>
<tr>
<th>267CS, 269CS</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
<td></td>
</tr>
<tr>
<td>Fieldbus 7/8 in. (without mating plug, recommended for FOUNDATION fieldbus)</td>
<td>U1</td>
</tr>
<tr>
<td>Fieldbus M12 x 1 (without mating plug, recommended for PROFIBUS PA)</td>
<td>U2</td>
</tr>
<tr>
<td>Harting Han 8D (8U) - Straight entry</td>
<td>U3</td>
</tr>
<tr>
<td>Harting Han 8D (8U) - Angle entry</td>
<td>U4</td>
</tr>
<tr>
<td>Harting Han 7D</td>
<td>U5</td>
</tr>
<tr>
<td>Harting Han 8D (8U) - For four-wire add-on unit</td>
<td>U6</td>
</tr>
<tr>
<td>Harting Han 7D - For four-wire add-on Unit</td>
<td>U7</td>
</tr>
</tbody>
</table>

**Material Traceability**
- Certificate of compliance with the order 2.1 acc. EN 10204 for process wetted parts | H1 |
- Inspection certificate 3.1 acc. EN 10204 of process wetted parts | H3 |
- Test report 2.2 acc. EN 10204 of the pressure bearing and process wetted parts | H4 |

**Certificates**
- Inspection certificate 3.1 acc. EN 10204 of calibration | C1 |
- Inspection certificate 3.1 acc. EN 10204 of cleanliness stage | C3 |
- Inspection certificate 3.1 acc. EN 10204 of helium leakage test of the sensor module | C4 |
- Inspection certificate 3.1 acc. EN 10204 of pressure test | C5 |
- Declaration of compliance with the order 2.1 acc. EN 10204 for instrument design | C6 |
- Calibration record | CB |
- Separate calibration record | CC |
- SIL2 - Declaration of Conformity | CL |
- GOST Russia - Without Explosion Protection | WC |
- GOST Kazakhstan - Without Explosion Protection | WD |
- GOST Ukraine - Without Explosion Protection | WE |
- GOST Belarus - Without Explosion Protection | WF |

15) Minor parts with factory certificate acc. EN 10204
Standard delivery items (changes possible by an additional ordering code)

- Adapters supplied singly
- Plugs for process axis (no drain/vent valves)
- General purpose (no Ex application)
- No display, no mounting bracket
- English-language manual and labels
- Type plate material: barrel electronics housing code A, B, E, G, S, T – stainless steel
  DIN electronics housing code J, K, W – plastic
- Configuration with kPa and °C units
- No test, inspection or material certificates

Important remark for all models
The selection of suitable wetted parts and filling fluid for compatibility with the process media is a customers responsibility, if not otherwise notified before manufacturing.

NACE compliance information
1. The materials of constructions comply with metallurgical recommendations of NACE MR0175/ISO 15156 for sour oil field production environments. As specific environmental limits may apply to certain materials, please consult latest standard for further details. Materials AISI 316 / AISI 316L, Hastelloy C-276, Monel 400 also conform to NACE MR0103 for sour refining environments.

2. NACE MR0175 addresses bolting requirements in two classes:
   - Exposed bolts: bolts directly exposed to the sour environment or buried, encapsulated or anyway not exposed to atmosphere
   - Non exposed bolts: the bolting must not be directly exposed to sour environments, and must be directly exposed to the atmosphere at all times.

267CS, 269CS bolting identified by “NACE” are in compliance to the requirements of NACE MR0175 when considered “non exposed bolting”

Trademarks
TM Hastelloy is a trademark of Cabot Corporation
TM Monel is a trademark of International Nickel Corporation
TM Viton is a trademark of DuPont Dow Elastomers