

# Model 267CR Multivariable Model 269CR Multivariable with remote seals for mass flow

Measurement made easy

2600T Series Pressure  
Transmitters

Engineered solutions for all  
applications



## Selectable maximum working pressure

- Up to 41 MPa, 5945 psi

## Base accuracy

- $\pm 0.075\%$  /  $\pm 0.04\%$

## Span limits

- 1 ... 2000 kPa; 4 in H<sub>2</sub>O ... 290 psi differential pressure
- 2 ... 41 MPa; 290 ... 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

## Reduced process penetrations

- Less costs
- 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

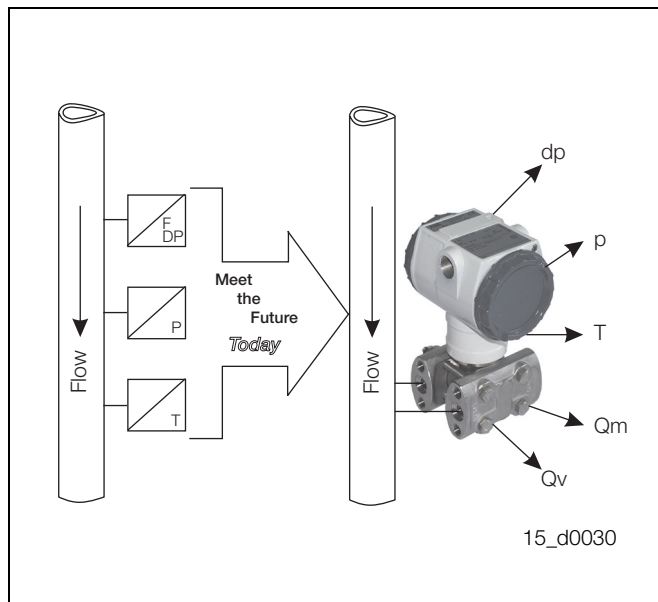
Due to its multisensor technology, the 267C./269C. permits measurement of three separate process variables simultaneously and provides dynamic calculation of fully compensated mass flowrate for steam and liquids respectively standard volume flow for gases. It measures differential pressure and absolute 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:

$$Q_m \approx \sqrt{dp \frac{\rho}{T}}$$



The dynamic mass flow compensation of 267C./269C. is based on the following formula (according to EN ISO 5167/AGA 3):

$$Q_m \approx C \cdot E_v \cdot Y_1 \cdot d^2 \sqrt{dp \cdot \rho}$$

$Q_m$  = mass flowrate  
 $C$  = discharge coefficient  
 $E_v$  = velocity of approach factor  
 $Y_1$  = gas expansion factor  
 $d$  = bore diameter  
 $dp$  = differential pressure  
 $\rho$  = fluid density

The following standards are used for flow calculation:

- AGA 3
- DIN EN ISO 5167

## 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:

$$Re = \frac{v \cdot D \cdot \rho}{\nu}$$

$v$  = velocity  
 $D$  = interior pipe diameter  
 $\rho$  = medium density  
 $\nu$  = 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:

$$Y_1 = 1 - (0.41 + 0.35 \cdot \beta^4) \frac{dp}{p \cdot \kappa}$$

For nozzles:

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

$\beta$  = ratio of diameters (Beta ratio)  
 $dp$  = differential pressure  
 $p$  = static pressure  
 $\kappa$  = 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.

**General Description**

Models detailed in this data sheet apply to those transmitters which include one or two remote seal(s) connected via a capillary tube to the transmitter sensor.

Mass/standard volume flow measurements can be performed with Model 267C./269C. To accomplish this, either two remote seals of same type and size or one remote seal (on the positive or negative side) and a standard threaded connection 1/4-18 NPT (flange) or 1/2-14 NPT (oval flange) can be used for the other side of the sensing element.

The following table indicates the standard remote seal types which may be combined with 267C./269C. transmitters.

All data and detailed information can be taken from remote seal data sheet SS/S265.

Model	Remote seal type	Size
S265W	Wafer Flush diaphragm	2 in / DN 50 3 in / DN 80
	Wafer extended diaphragm	2 in / DN 50 3 in / DN 80
S265F	Flanged Flush diaphragm	2 in / DN 50 3 in / DN 80
	Flanged extended diaphragm	2 in / DN 50 3 in / DN 80

The following technical data applies to equipment with identical remote seals on both sides.

## Functional Specifications

### Measuring range and span limits

#### Differential pressure sensors

Sensor code	Upper range limit (URL)	Lower range limit (LRL)	Minimum span							
			One remote seal (max. capillary tube length = 16 m)				Two remote seals of the same type (max. capillary tube length = 16 m)			
			Flush diaphragm		extended diaphragm		Flush diaphragm		extended diaphragm	
			DN50/2 in	DN80/2 in DN100/4 in	DN50/2 in	DN80/2 in DN100/4 in	DN50/2 in	DN80/2 in DN100/4 in	DN50/2 in	DN80/2 in DN100/4 in
<b>C</b>	6 kPa 60 mbar 24 in H <sub>2</sub> O	0	–	6 kPa 60 mbar 24 in H <sub>2</sub> O	–	6 kPa 60 mbar 24 in H <sub>2</sub> O	2 kPa 20 mbar 8 in H <sub>2</sub> O	1 kPa 10 mbar 4 in H <sub>2</sub> O	3 kPa 30 mbar 12 in H <sub>2</sub> O	1 kPa 10 mbar 4 in H <sub>2</sub> O
<b>F</b>	40 kPa 400 mbar 160 in H <sub>2</sub> O	0	10 kPa 100 mbar 40 in H <sub>2</sub> O	6 kPa 60 mbar 24 in H <sub>2</sub> O	16 kPa 160 mbar 64 in H <sub>2</sub> O	6 kPa 60 mbar 24 in H <sub>2</sub> O	3 kPa 30 mbar 12 in H <sub>2</sub> O	1.3 kPa 13.3 mbar 5.3 in H <sub>2</sub> O	3 kPa 30 mbar 12 in H <sub>2</sub> O	1.3 kPa 13.3 mbar 5.3 in H <sub>2</sub> O
<b>L</b>	250 kPa 2500 mbar 1000 in H <sub>2</sub> O	0	10 kPa 100 mbar 40 in H <sub>2</sub> O	6 kPa 60 mbar 24 in H <sub>2</sub> O	16 kPa 160 mbar 64 in H <sub>2</sub> O	6 kPa 60 mbar 24 in H <sub>2</sub> O	8.3 kPa 83 mbar 34 in H <sub>2</sub> O	8.3 kPa 83 mbar 34 in H <sub>2</sub> O	8.3 kPa 83 mbar 34 in H <sub>2</sub> O	8.3 kPa 83 mbar 34 in H <sub>2</sub> O
<b>N</b>	2000 kPa 20 bar 290 psi	0	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi	67 kPa 0.67 bar 9.7 psi

#### Absolute pressure sensors

Sensor code	Upper range limit (URL)	Lower range limit (LRL)	Minimum span
<b>2</b>	2000 kPa 20 bar 290 psi	0 abs	20 kPa 0.2 bar 2.9 psi
<b>3</b>	10000 kPa 100 bar 1450 psi	0 abs	100 kPa 1 bar 14.5 psi
<b>4</b>	41000 kPa 410 bar 5945 psi	0 abs	410 kPa 4.1 bar 59.5 psi

#### Span limits

Maximum span = URL = upper range limit  
(with the flow measurement shut off, can be adjusted up to  $\pm$  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  $\geq$  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:  $\leq$  2.5 sec with minimal damping

#### Insulation resistance

> 100 M $\Omega$  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

Identification, density and process temperature application ranges for the various fill liquids in the capillary tube/remote seal.

Fill liquid (applications)	ID	Density at 20 °C (68 °F) in kg/m³	Process temperature °C (°F)
Silicone oil	IB	924	-30...+250 (-22...+482)
Carbon fluoride	L	1860	-30...+150 (-22...+302)
High-temperature oil	SH	1070	-10...+375 (+14...+707)
White oil	WB	849	-6...+200 (+21...+392)
Vacuum-proof	IC-V	1055	-30...+200 (-22...+392)

#### Storage

Lower limit: -50 °C (-58 °F), -40 °C (-40 °F) for LCD displays  
-6 °C (+21) with white oil  
Upper limit: +85 °C (+185 °F)

### Pressure limits

Data relating to maximum working pressure for the relevant remote seal can be found in the remote seal data sheet.

Fill liquid (applications)	ID	Pressure in mbar abs					
		20 °C (68 °F)	100 °C (212 °F)	150 °C (302 °F)	200 °C (392 °F)	250 °C (482 °F)	375 °C (707 °F)
Silicone oil	IB	> 500	> 500	> 500	> 750	> 1000	–
Carbon fluoride	L	> 1000	> 1000	> 1000	–	–	–
High-temp. oil	SH	> 500	> 500	> 500	> 750	> 1000	> 1000
White oil	WB	> 500	> 1000	> 1000	> 1000	> 1000	–
Vacuum-proof	IC-V	> 5	> 25	> 38	> 50	–	–

#### Overpressure limits (without damage to the transmitter)

The smaller value shall apply, depending upon the static pressure range of the transmitter or flange pressure level of the remote seal (refer to the remote seal data sheet).

#### Test pressure

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, or up to 1.5 times the flange pressure level, depending upon which value is lower.

## 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.

#### Transmitters 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:

$U_i = 30 \text{ V}$

$I_i = 200 \text{ mA}$

$P_i = 0.8 \text{ W}$  for T4 where  $T_a = -40 \text{ °C to } +85 \text{ °C}$  (-40 °F to +185 °F)

$P_i = 1.0 \text{ W}$  for T4 where  $T_a = -40 \text{ °C to } +70 \text{ °C}$  (-40 °F to +158 °F)

For temperature class T6:

$P_i = 0.7 \text{ W}$  for T4 where  $T_a = -40 \text{ °C to } +40 \text{ °C}$  (-40 °F to +104 °F)

Effective internal capacitance:  $C_i \leq 10 \text{ nF}$

Effective internal inductance:  $L_i \approx 0$

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 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  $U_i = 17.5 \text{ V}$   
II 1/2 GD T 95 °C EEx ia or ib IIC T4  $I_i = 360 \text{ mA}$   
 $P_i = 2.52 \text{ W}$

II 1/2 GD T 50 °C EEx ia or ib IIB T6  $U_i = 17.5 \text{ V}$   
II 1/2 GD T 95 °C EEx ia or ib IIB T4  $I_i = 380 \text{ mA}$   
 $P_i = 5.32 \text{ W}$

or connection to supply units or barriers with linear characteristics:  
Maximum values:

II 1/2 GD T 50 °C EEx ia or ib IIC T6  $U_i = 24 \text{ V}$   
II 1/2 GD T 95 °C EEx ia or ib IIC T4  $I_i = 250 \text{ mA}$   
 $P_i = 1.2 \text{ W}$

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

Maximum permissible ambient temperatures depending on the  
temperature class:

T4: -40 °C to +85 °C (-40 °F to +185 °F)  
T5, T6: -40 °C to +40 °C (-40 °F to +104 °F)

**Transmitter of category 3 for 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  $\pm$ ):  $U \leq 45 \text{ V}$   
 $I \leq 22.5 \text{ mA}$

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

Ambient temperature range:

Temperat. class T4  $T_a = -40 \text{ °C to } +85 \text{ °C (-40 °F to } +185 \text{ °F)}$   
Temperat. class T5 and T6  $T_a = -40 \text{ °C to } +40 \text{ °C (-40 °F to } +104 \text{ °F)}$

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

Transmitter with 4 to 20 mA output signal and HART communication and fieldbus transmitter (PROFIBUS PA/FOUNDATION fieldbus)

Identification: II 1/2 G EEx d IIC T6

Operating conditions:

Ambient temperature range: -40 °C to +75 °C (-40 °F to +167 °F)

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

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

**protection type "Limited energy equipment EEx nL" according to**  
**Directive 94/9/EC (ATEX) (alternate certification)**

Transmitter with 4 to 20 mA output signal and HART communication

Identification: II 1/2 GD T50 °C EEx ia IIC T6  
II 1/2 GD T95 °C EEx ia IIC T4;  
(refer to "EEx ia" for additional data)

or

Identification: II 1/2 GD T85 °C EEx d IIC T6

Ambient temperature range:

-40 °C to +75 °C (-40 °F to +167 °F)

or

Identification: II 3 GD T 50 °C EEx nL IIC T6  
II 3 GD T95 °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

Intrinsically Safe: Class I; Division 1; Groups A, B, C, D;

Class I; Zone 0; Group IIC; AEx ia IIC

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

Maximum permissible ambient temperatures depending on the  
temperature class:

$U_{\max} = 30 \text{ V}, C_i = 10.5 \text{ nF}, L_i = 10 \mu\text{H}$			
Ambient temperature	Temperature class	$I_{\max}$	$P_i$
-40 °C to +85 °C (-40 °F to +185 °F)	T4	200 mA	0.8 W
-40 °C to +70 °C (-40 °F to +158 °F)			1 W
-40 °C to +40 °C (-40 °F to +104 °F)	T5	25 mA	0.75 W
	T6		0.5 W

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, F, G

Transmitter with 4 to 20 mA output signal and HART communication and fieldbus transmitter (PROFIBUS PA/FOUNDATION fieldbus)

Explosion Proof: Class I, Division 1, Groups A, B, C, D;

Class II/III, Division 1, Groups E, F, G

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

**Canadian standard (CSA)**Transmitter with 4 to 20 mA output signal and HART communication and fieldbus transmitter (PROFIBUS PA/FOUNDATION fieldbus)

Explosion Proof: Class I, Division 1, Groups B, C, D;

Class II/III, Division 1, Groups E, F, G

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

**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<sub>i</sub> 0.8 W Ta = 85 °C) / T6 (P<sub>i</sub> 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<sub>i</sub> = 30 VI<sub>i</sub> = 200 mAP<sub>i</sub> = 0.8 W for T4 where Ta = +85 °C (+185 °F) orP<sub>i</sub> = 0.7 W for T4 where Ta = +40 °C (+104 °F)

Effective internal capacitance: Ci = 52 nF

Effective internal inductance: Li ≈ 0 mH

Ex n installation input parameters:

U<sub>i</sub> = 30 V**Transmitter with protection type "flameproof enclosure EEx d"**Transmitter with 4 to 20 mA output signal and HART communication and fieldbus transmitter (PROFIBUS PA/FOUNDATION fieldbus, Modbus)

Identification:

Zone 1: 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 EEx 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:

$$R(k\Omega) = \frac{\text{Supply voltage} - \text{minimum operating voltage (V DC)}}{22.5 \text{ mA}}$$

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 or

Output current in mA or

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 based on Bell 202 FSK standard).

**Output function**

Mass / standard volume flow calculations are performed according to the following:

$$Q_m \approx C \cdot E_v \cdot Y_1 \cdot d^2 \sqrt{dp \cdot \rho} \quad \text{For steam/fluid}$$

$$Q_n \approx C \cdot E_v \cdot Y_1 \cdot d^2 \sqrt{dp \cdot \rho} - \frac{1}{\rho_n} \quad \text{For gas}$$

where:

Q<sub>m</sub> = mass flowrate

Q<sub>n</sub> = standard flowrate

C = discharge coefficient

E<sub>v</sub> = velocity of approach factor

Y<sub>1</sub> = gas expansion factor

d = bore diameter

dp = differential pressure

ρ = fluid density

ρ<sub>n</sub> = 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.

Standard setting: 3.6 mA

Maximum alarm current: configurable from 20 to 22.5 mA

Standard setting: 21 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

Physical layer in compliance with IEC 1158-2/EN 61158-2 with transmission to Manchester II modulation, at 31.25 kbit/sec.

### 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.  
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.

## 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

Physical layer in compliance with IEC 1158-2/EN 61158-2 with transmission to Manchester II modulation, at 31.25 kbit/sec.

### 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.



## 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.

The threshold values and response times are dependent upon the type of remote seal and measuring point.  
Refer also to the remote seal data sheet.

When using devices with two remote seals, symmetrical arrangement should be selected (nominal size, capillary tube length, diaphragm material).

### Accuracy rating

Percentage of calibrated span including combined effects of linearity, hysteresis and reproducibility.  
For fieldbus versions SPAN refers to analog input function block outscale range.

Differential pressure sensor

267CR

– ± 0.075 % for turndown from 1:1 to 10:1

–  $\pm \left( 0.075 + 0.005 \times \frac{\text{URL}}{\text{Span}} - 0.05 \right) \%$  For turndown greater than 10:1

269CR

– ± 0.04 % for turndown from 1:1 to 10:1

–  $\pm \left( 0.04 + 0.005 \times \frac{\text{URL}}{\text{Span}} - 0.05 \right) \%$  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

267CR

± (0.04 % URL + 0.065 % span)

269CR

± (0.03 % URL + 0.05 % span)

Absolute pressure sensor

± (0.08 % URL + 0.08 % span)

Limited to ± (0.1 % URL + 0.1 % span) per the complete temperature range of 120 K (216 °F)

The entire temperature error results from the combination of the above influences on the transmitter with remote seal influences, in combination with the operating temperature.

For detailed information on additional influences on the remote seal: refer to the remote seal data sheet.

### 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

Capillary tube influences resulting from different installation heights are not included in the following information.

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 H<sub>2</sub>O) of URL which can be corrected with the zero adjustment. No effect on the span.

## Technical Specification

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

### Materials (without remote seal)

#### Process isolating diaphragms<sup>1)</sup>

Hastelloy C276™ stainless steel (1.4435); Monel 400™, Tantalum

#### Process flange, adapter, plugs and drain/vent valves for the minus-side (without remote seal)<sup>1)</sup>

Hastelloy C276™ stainless steel (1.4404); Monel 400™; Kynar (PVDF)

#### Blind flange (remote seal side)

Stainless steel

#### Sensor fill fluid

Silicone oil, inert fill (carbon fluoride)

#### Sensor housing

Stainless steel

#### Mounting bracket

Stainless steel

#### Gaskets<sup>1)</sup>

Viton™ (FPM), Perbunan (NBR), EPDM, PTFE

#### 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.

### Certificates (test, model, calibration, material traceability)

## Process connections

- Flange on compensating side: ¼-18 NPT on process axis, With adapter: ½-14 NPT on process axis; fixing threads 7/16-20 UNF

Refer to the remote seal data sheet for the process connection variants.

## 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 and remote seals)

Approximately 3.5 kg (8lb), add 1.5 kg (3.4lb) for stainless steel housing. Packaging adds 650 g

## Packaging

Carton

™ Hastelloy is a Cabot Corporation trademark

™ Monel is an International Nickel Co. trademark

™ Viton is a DuPont de Nemours trademark

<sup>1)</sup> 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:

4 mA	Zero point
20 mA	Upper range limit (URL)
Output	Square root
Damping	0.125 sec
Transmitter failure mode	21 mA
Optional LCD display	Specified flow

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:

Measure profile	Pressure
Engineering unit	mbar/bar
Output scale 0 %	Lower range limit (LRL)
Output scale 100 %	Upper range limit (URL)
Output	Square root
Upper alarm limit	Upper range limit (URL)
Upper warning limit	Upper range limit (URL)
Lower warning limit	Lower range limit (LRL)
Lower alarm limit	Lower range limit (LRL)
Limit hysteresis	0.5 % of output scale
PV filter	0.125 sec
Address	126

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 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:

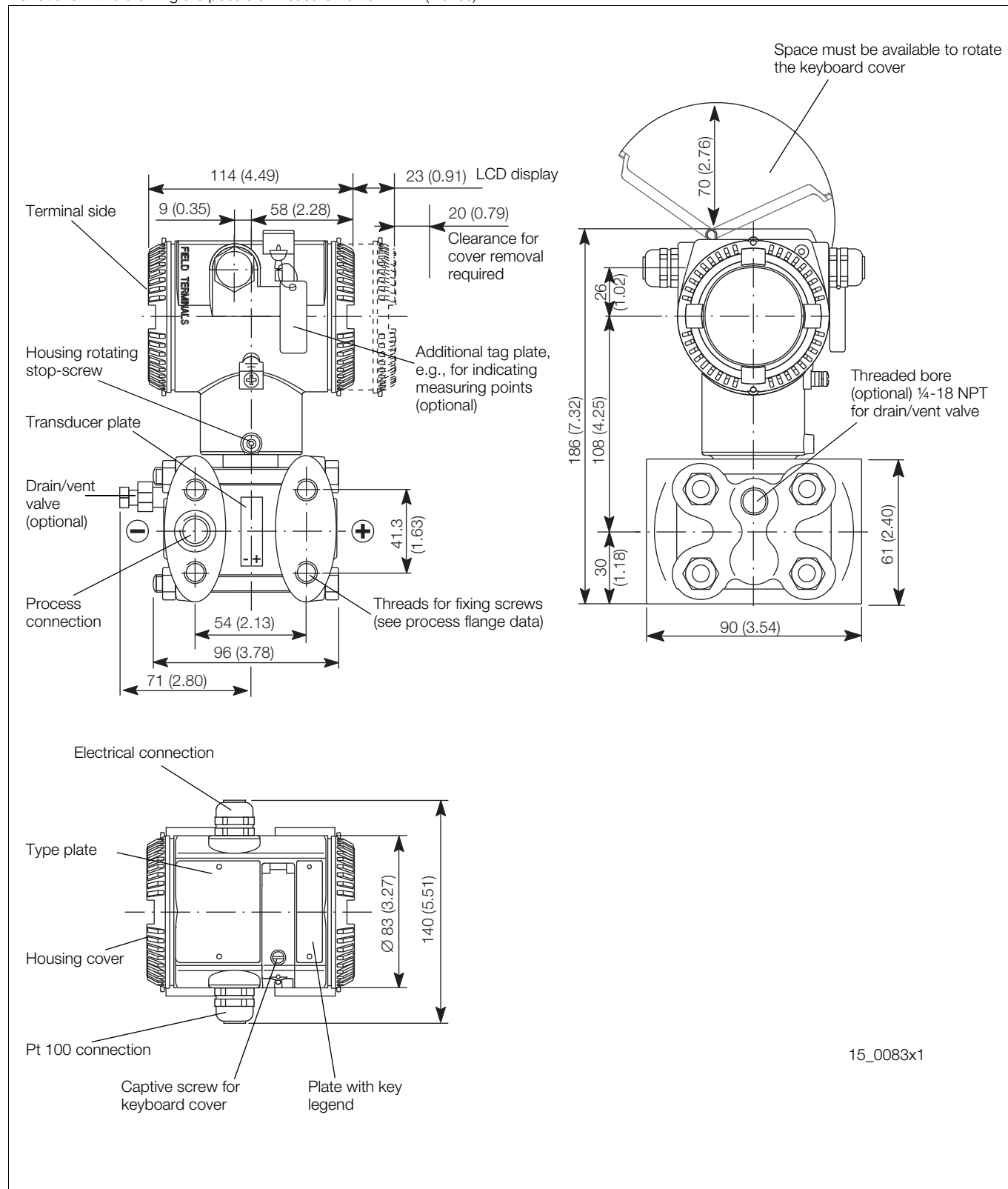
Measure profile	Pressure
Engineering unit	mbar/bar
Output scale 0 %	Lower range limit (LRL)
Output scale 100 %	Upper range limit (URL)
Output	Square root
Upper alarm limit	Upper range limit (URL)
Upper warning limit	Upper range limit (URL)
Lower warning limit	Lower range limit (LRL)
Lower alarm limit	Lower range limit (LRL)
Limit hysteresis	0.5 % of output scale
PV filter	0.125 sec
Address	not required

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.

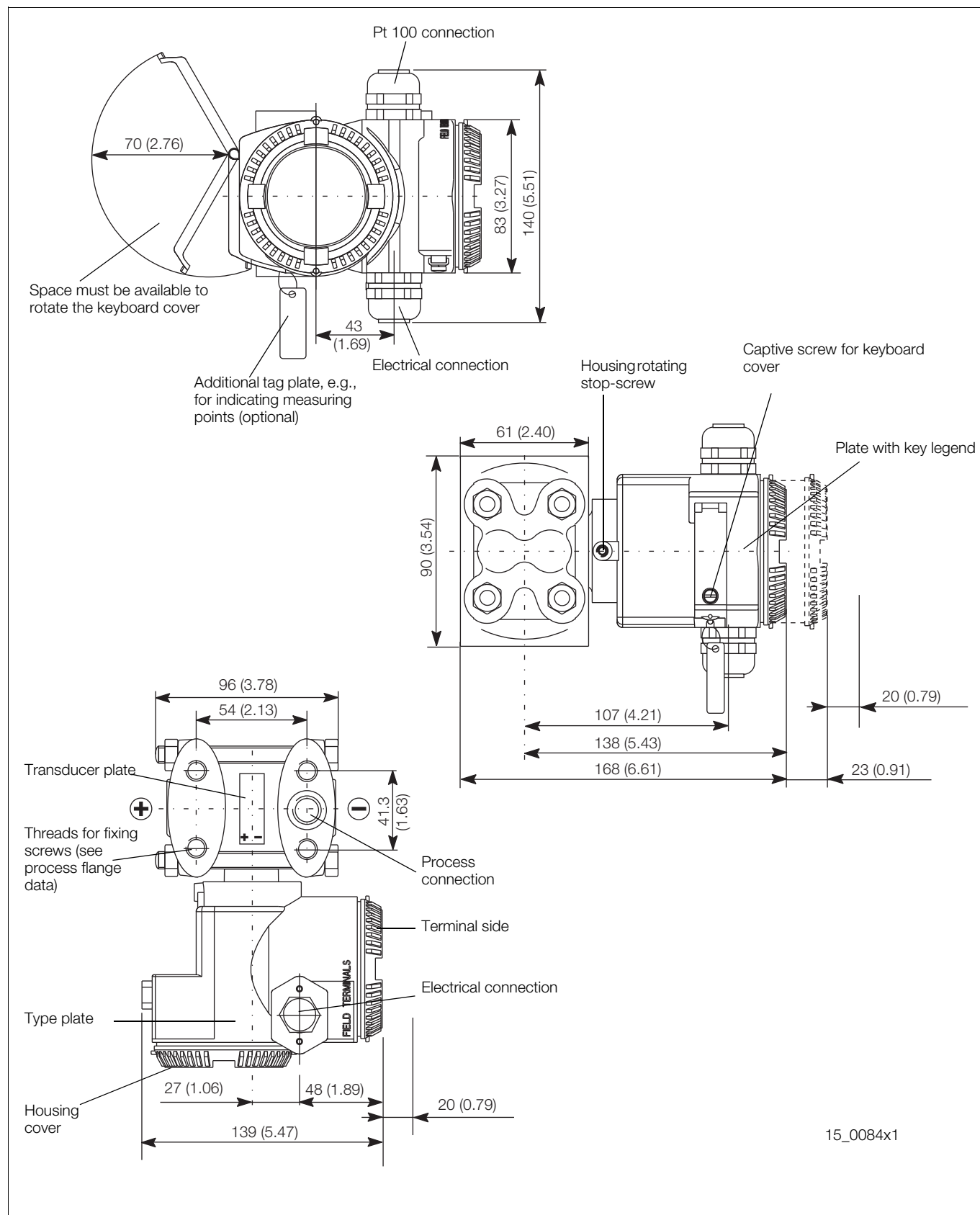
## Mounting Dimensions (not design data)

### Transmitter with barrel housing – without remote seal

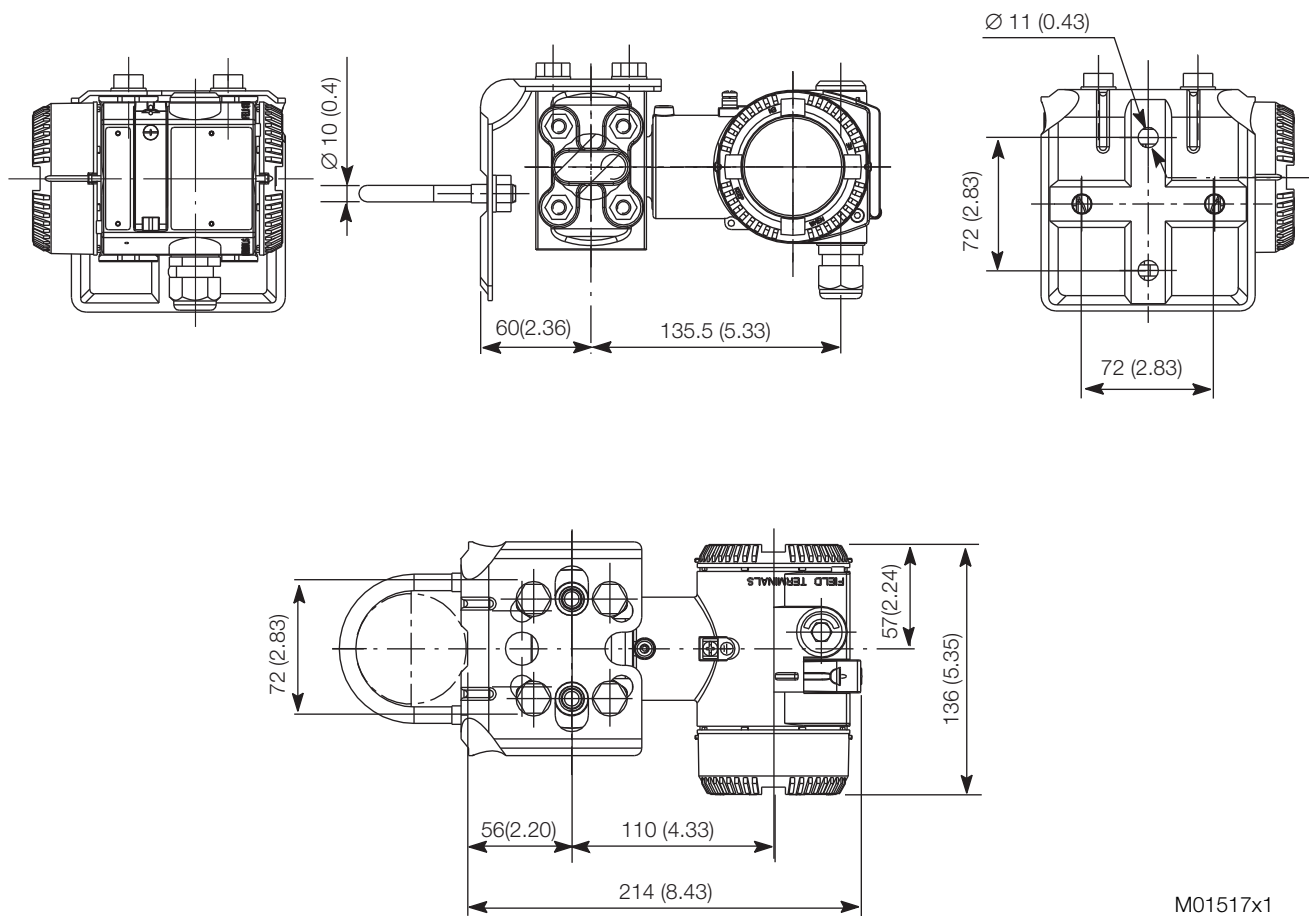
Deviations in the drawing are possible. Measurements in mm (inches)



## Transmitter with DIN housing – without remote seal



## Mounting options with bracket



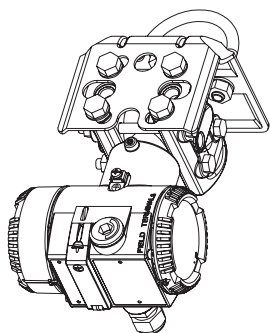
M01517x1

Vertical pipe mounting

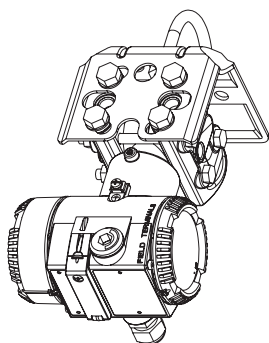
Horizontal pipe mounting

Vertical pipe mounting and transmitter above the mounting bracket

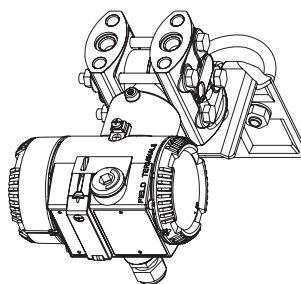
Horizontal pipe mounting and transmitter above the mounting bracket



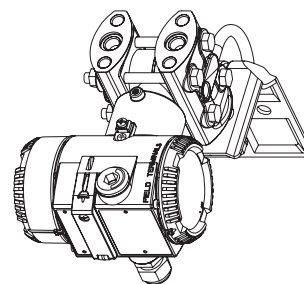
M01518x1



M01519x1



M01520x1



M01521x1

Electrical connections

Standard terminal block

Test sockets for 4 to 20 mA  
(not with fieldbusfieldbus  
transmitters)

Grounding/potential  
equalizing terminal

Output signal/power supply

Cable entry

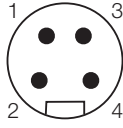
Pt 100 cable entry

Connection for Pt 100

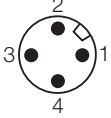
Screw terminals for leads with 0.5  
to 2.5 mm² cross-section

**Fieldbus plug connector**

7/8 in connector



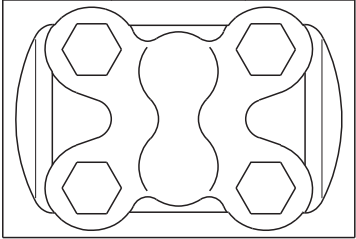
M12 x 1 connector



15\_0066x1

Pin (male) assignment		
Number	FOUNDATION fieldbus	PROFIBUS PA
1	FF-	PA+
2	FF+	Ground
3	Shield	PA-
4	Ground	Shield

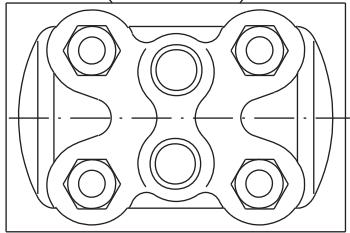
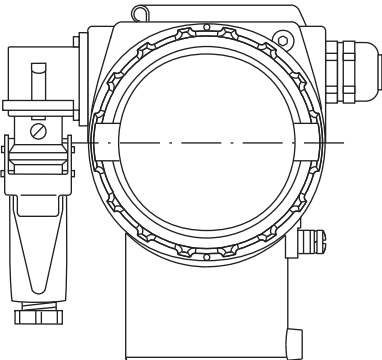
Mating plug (socket) not supplied



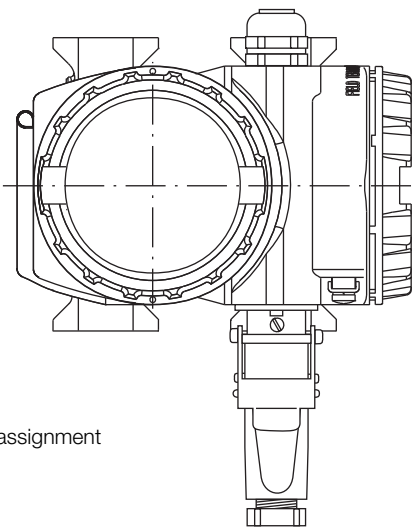
M01450x1

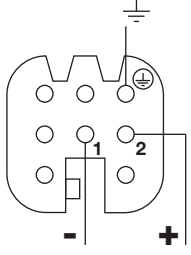
Harting Han 8D (8U) connector

**DIN housing**



**Barrel housing**





Harting Han 8D (8U) pin assignment  
(socket view)

15\_0079x1

## Ordering Information

Multivariable transmitter, for mass flow			Variant digit No.	1- 6	7	8	9	10	11	Code			
267CR	Base accuracy: 0.075 %		Catalog No.	267CR-									
269CR	Base accuracy: 0.04 %		Catalog No.	269CR-									
Sensor - Span limits					C F L N Y								
6 kPa	60 mbar	24 in. H <sub>2</sub> O (45 mm Hg)											
40 kPa	400 mbar	160 in. H <sub>2</sub> O (300 Hg)											
250 kPa	2500 mbar	1000 in. H <sub>2</sub> O (1875 Hg)											
2000 kPa	20 bar	290 psi											
100 kPa	1000 mbar	400 in. H <sub>2</sub> O											
Static pressure													
0 ... 2 MPa	0 ... 20 bar	0 ... 290 psi		2									
0 ... 10 MPa	0 ... 100 bar	0 ... 1450 psi		3									
0 ... 41 MPa	0 ... 410 bar	0 ... 5945 psi		4									
Diaphragm material / Fill fluid													
AISI 316L SST (1.4435)	Silicone oil	NACE		S									
Hastelloy C-276	Silicone oil	NACE		K									
Monel 400	Silicone oil	NACE		M									
Monel 400 gold plated	Silicone oil	NACE		V									
Tantalum	Silicone oil	NACE		T									
AISI 316L SST (1.4435)	Inert fluid	NACE		A									
Hastelloy C-276	Inert fluid	NACE		F									
Monel 400	Inert fluid	NACE		C									
Monel 400 gold plated	Inert fluid	NACE		Y									
Tantalum	Inert fluid	NACE		D									
With remote seal	Silicone oil			R									
With remote seal	Inert fluid			2									
Process connection material / Process connection													
AISI 316L SST (1.4404 / 1.4408)	1/4-18 NPT-f direct	NACE	1)	A									
AISI 316L SST (1.4404 / 1.4408)	1/2-14 NPT-f through adapter	NACE	1)	B									
Hastelloy C-276	1/4-18 NPT-f direct	NACE	1)	D									
Hastelloy C-276	1/2-14 NPT-f through adapter	NACE	1)	E									
Monel 400	1/4-18 NPT-f direct	NACE	1)	G									
Monel 400	1/2-14 NPT-f through adapter	NACE	1)	H									
AISI 316L SST (1.4404 / 1.4408)	With two remote Seals		2)	R									
Bolts / Gaskets													
AISI 316L SST (NACE - non exposed)	Viton			3									
AISI 316L SST (NACE - non exposed)	PTFE (Max. 10 MPa)			4									
AISI 316L SST (NACE - non exposed)	EPDM			5									
AISI 316L SST (NACE - non exposed)	Perbunan			6									
AISI 316L SST (NACE - non exposed)	With two remote seals			R									

Continued on next page

- 1) Only available with Diaphragm material / Fill fluid code R, 2  
2) Not available with Diaphragm material / Fill fluid code R, 2



## Ordering Information, continued

Multivariable transmitter, for mass flow		Variant digit No.	1 - 6	9	10	11	12	13	Code			
<b>267CR</b>	<b>Base accuracy: 0.075 %</b>	Catalog No.	<b>267CR-</b>									
<b>269CR</b>	<b>Base accuracy: 0.04 %</b>	Catalog No.	<b>269CR-</b>									
<b>Electronic housing material</b>		<b>Electrical connection</b>										
Aluminium Alloy (Barrel type)		1/2-14 NPT							A			
Aluminium Alloy (Barrel type)		M20 x 1.5				3)			B			
Aluminium Alloy (Barrel type)		Harting Han connector				4)			E			
Aluminium Alloy (Barrel type)		Fieldbus connector				5)			G			
AISI 316L SST (Barrel type)		1/2-14 NPT							S			
AISI 316L SST (Barrel type)		M20 x 1.5				3)			T			
Aluminium Alloy (DIN type)		M20 x 1.5				3)			J			
Aluminium Alloy (DIN type)		Harting Han connector				4)			K			
Aluminium Alloy (DIN type)		Fieldbus connector				5)			W			
<b>Output</b>		<b>Additional options</b>										
HART digital communication and 4 ... 20 mA		(Additional options not requested)				7)			H			
HART digital communication and 4 ... 20 mA		(Additional options to be ordered by additional ordering code)				6)			1			
PROFIBUS PA		(Additional options not requested)				7)			P			
PROFIBUS PA		(Additional options to be ordered by additional ordering code)				6)			2			
FOUNDATION fieldbus		(Additional options not requested)				7)			F			
FOUNDATION fieldbus		(Additional options to be ordered by additional ordering code)				6)			3			
Modbus RS 485		(Additional options not requested)				7)			M			
Modbus RS 485		(Additional options to be ordered by additional ordering code)				6)			5			
Modbus RS 232		(Additional options not requested)				7)			N			
Modbus RS 232		(Additional options to be ordered by additional ordering code)				6)			6			

To select the obligatory Remote Seals, add their ordering codes acc. to Data Sheet SS/S265 to the Catalog No. after the optional ordering codes

Additional ordering information										Code			
<b>267CR , 269CR</b>													
<b>Vent valve material / Position</b>													
AISI 316L SST (1.4404)	On process axis	NACE								V1			
AISI 316L SST (1.4404)	On flanges side top	NACE								V2			
AISI 316L SST (1.4404)	On flanges side bottom	NACE								V3			
Hastelloy C-276	On process axis	NACE								V4			
Hastelloy C-276	On flanges side top	NACE								V5			
Hastelloy C-276	On flanges side bottom	NACE								V6			
Monel 400	On process axis	NACE								V7			
Monel 400	On flanges side top	NACE								V8			
Monel 400	On flanges side bottom	NACE								V9			

Continued on next page

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

## Additional ordering information

267CR , 269CR		Code		
<b>Explosion protection</b>				
ATEX Group II Category 1/2 GD - Intrinsic Safety EEx ia		E1		
ATEX Group II Category 1/2 G - Flameproof EEx d		E2		
ATEX Group II Category 3 GD - Type of Protection N EEx nL Energy Limited		E3		
IECEX ia Ga / Gb, IECEX iaD 20		E8		
IECEX d		E9		
ATEX II 1/2 GD EEx ia + ATEX II 1/2 GD EEx d + ATEX EEx nL		EW		
Factory Mutual (FM) - Intrinsically Safe		EA		
Factory Mutual (FM) - Explosion-proof	8)	EB		
Canadian Standard Association - Explosion Proof		EE		
Canadian Standard Association - Explosion Proof (Canada & USA)		EM		
NEPSI Ex ia II C T4/T6		EY		
NEPSI Ex d II C T6		EZ		
GOST Russia - EEx ia		W1		
GOST Russia - EEx d		W2		
GOST Kazakhstan - EEx ia		W3		
GOST Kazakhstan - EEx d		W4		
GOST Ukraine - EEx ia		WA		
GOST Ukraine - EEx d		WB		
GOST Belarus - EEx ia		WG		
GOST Belarus - EEx d		WL		
SAA Ex d IIC T6 and Ex td A21 IP 66 T85 °C		X1		
<b>Integrated digital display (LCD)</b>				
With integrated LCD display		L1		
With integrated LCD display (backlit)		L2		
<b>Mounting bracket shape / Material</b>				
For pipe mounting	AISI 304 SST (1.4301)	B2		
For wall mounting	AISI 304 SST (1.4301)	B4		
<b>Operating manual</b>				
German		M1		
French		M4		
English		M5		
Russian		MB		
<b>Label and Tag Language</b>				
German (stainless steel)	9)	T1		
German and English (plastic)	10)	TA		
<b>Additional tag plate</b>				
Stainless steel		I1		
<b>Housing Accessories</b>				
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		

Continued on next page

8) Only with Electrical Connection 1/2-14 NPT and Stainless Steel Tag Plate

9) Not available with DIN Electronic Housing code J, K, W

10) Not available with Factory Mutual - Explosion Proof

## Additional ordering information

267CR , 269CR	Code			
<b>Connector Type</b>				
Fieldbus 7/8 in. (without mating plug, recommended for FOUNDATION fieldbus)	U1			
Fieldbus M12 x 1 (without mating plug, recommended for PROFIBUS PA)	U2			
Harting Han 8D (8U) - Straight entry	U3			
Harting Han 8D (8U) - Angle entry	U4			
Harting Han 7D	U5			
Harting Han 8D (8U) - For four-wire add-on unit	U6			
Harting Han 7D - For four-wire add-on Unit	U7			
<b>Material traceability</b>				
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 with analysis certificates as material verification	H3			
Test report 2.2 acc. EN 10204 of the pressure bearing and process wetted parts	H4			
<b>Certificates</b>				
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			

11) Minor parts with factory certificate acc. EN 10204

## Standard delivery items (changes possible by an additional ordering code)

- Adapters supplied singly
- Plugs for the connection flange with one-side remote seal connection (no drain/vent valve)
- 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

- 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.
- 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.

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

### Trademarks

- <sup>TM</sup> Hastelloy is a trademark of Cabot Corporation
- <sup>TM</sup> Monel is a trademark of International Nickel Corporation
- <sup>TM</sup> Viton is a trademark of DuPont Dow Elastomers

# Contact us

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