

Model 265DS Differential

Series 2600T Pressure Transmitters

Engineered solutions for all applications



Selectable maximum operating pressure up to 41 MPa, 5,945 psi

Base accuracy

– ± 0.04 %

Span limits

– 0.05 ... 10,000 kPa; 0.2 in H₂O up to 1,450 psi

High-performance transmitter and smallest possible measuring ranges

Proven sensor technology together with state-of-the-art digital technology

– Large turndown ratio of up to 100:1

Comprehensive selection of sensors

– Optimized performance and stability

5-year stability

Flexible configuration options

– On device using control buttons in combination with LCD display, handheld terminal, or PC user interface

Various communication protocols available

– Enables integration into HART®, PROFIBUS PA, and FOUNDATION fieldbus platforms
– Upgrade options thanks to interchangeable electronics with automatic configuration

Full compliance with Pressure Equipment Directive (PED) category III

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1 Functional specifications

Measuring range and span limits

Sensor code	Upper range limit (URL)	Lower range limit (LRL)	Minimum span
A	1 kPa 10 mbar 4 in H ₂ O	-1 kPa -10 mbar -4 in H ₂ O	0.05 kPa 0.5 mbar 0.2 in H ₂ O
C	6 kPa 60 mbar 24 in H ₂ O	-6 kPa -60 mbar -24 in H ₂ O	0.2 kPa 2 mbar 0.8 in H ₂ O
F	40 kPa 400 mbar 160 in H ₂ O	-40 kPa -400 mbar -160 in H ₂ O	0.4 kPa 4 mbar 1.6 in H ₂ O
L	250 kPa 2,500 mbar 1,000 in H ₂ O	-250 kPa -2,500 mbar -1,000 in H ₂ O	2.5 kPa 25 mbar 10 in H ₂ O
N	2,000 kPa 20 bar 290 psi	-2,000 kPa -20 bar -290 psi	20 kPa 0.2 bar 2.9 psi
R	10,000 kPa 100 bar 1,450 psi	-10,000 kPa -100 bar -1,450 psi	100 kPa 1 bar 14.5 psi

Span limits

Maximum span = URL = Upper range limit

(Within the range limits, may be adjusted up to \pm upper range limit.)

Example (linear characteristic): -400 ... 400 mbar, but

Example (square root characteristic): 0 ... 400 mbar

To optimize performance characteristics, it is recommended that you select the transmitter sensor with the lowest turndown ratio.

Recommendation for square root function: At least 10 % of upper range limit (URL)

Zero suppression and elevation

The zero position and span can be set to any value within the range limits listed in the table if:

- Set span \geq minimum span

Damping

Adjustable time constant: 0 ... 60 s

This is in addition to the sensor response time.

Second sensor for absolute pressure measurement

Measuring range: 41 MPa, 410 bar, 5,945 psi

(0.6 MPa, 6 bar, 87 psi for sensor code A)

Warm-up period

According to technical data, ready for operation in \leq 2.5 s after switching on the transmitter, with minimum damping.

Insulation resistance

> 100 M Ω at 500 V DC (between terminals and ground)

2 Operating limits

2.1 Temperature limits in °C (°F)

	Ambient temperature range
Operating temperature	-40 ... 85 °C (-40 ... 185 °F)
LCD display	-20 ... 70 °C (-4 ... 158 °F)
Viton seals	-20 ... 85 °C (-4 ... 185 °F)
PTFE seals	-20 ... 85 °C (-4 ... 185 °F)

i Important

In the case of applications in potentially explosive atmospheres, the temperature range specified on the relevant certificate/approval must be observed.

	Process temperature range
Silicone oil	-40 ... 120 °C (-40 ... 248 °F) ¹⁾ For operating pressures \geq 10 kPa abs., 100 mbar abs., 1.45 psia
Carbon fluoride	-40 ... 120 °C (-40 ... 248 °F) ²⁾ For operating pressures \geq atmospheric pressure
Viton seals	-20 ... 120 °C (-4 ... 248 °F)
PTFE seals	-20 ... 85 °C (-4 ... 185 °F)

1) \leq 85 °C (185 °F) for operating pressures below 10 kPa, 100 mbar abs., 1.45 psia up to 3.5 kPa abs., 35 mbar abs., 0.5 psia

2) \leq 85 °C (185 °F) for operating pressures below atmospheric pressure up to 40 kPa abs., 400 mbar abs., 5.8 psia

	Storage temperature range
Storage temperature	-50 ... 85 °C (-58 ... 185 °F)
LCD display	-40 ... 85 °C (-40 ... 185 °F)

	Humidity during storage
Relative humidity	Up to 75 %

2.2 Pressure limits

Overpressure limits

(without damage to the transmitter)

Transmitter 265DS	Overpressure limits
Silicone oil for sensor code A	0.5 kPa abs., 5 mbar abs., 0.07 psia up to 0.6 MPa, 6 bar, 87 psi
Carbon fluoride for sensor code A	40 kPa abs., 400 mbar abs., 5.8 psia up to 0.6 MPa, 6 bar, 87 psi
Silicone oil for sensor code C ... R	0.5 kPa abs., 5 mbar abs., 0.07 psia up to 16 MPa, 160 bar, 2,320 psi, or 25 MPa, 250 bar, 3,625 psi, or 41 MPa, 410 bar, 5,945 psi depending on code variant selected
Carbon fluoride for sensor code C ... R	40 kPa abs., 400 mbar abs., 5.8 psia up to 16 MPa, 160 bar, 2,320 psi, or 25 MPa, 250 bar, 3,625 psi, or 41 MPa, 410 bar, 5,945 psi depending on code variant selected

Static pressure

The transmitter 265DS operates within the specifications with the following limits:

Transmitter 265DS	Static pressure
Silicone oil for sensor code A	3.5 kPa abs., 35 mbar abs., 0.5 psia up to 0.6 MPa, 6 bar, 87 psi
Carbon fluoride for sensor code A	40 kPa abs., 400 mbar abs., 5.8 psia up to 0.6 MPa, 6 bar, 87 psi
Silicone oil for sensor code C ... R	3.5 kPa abs., 35 mbar abs., 0.5 psia up to 16 MPa, 160 bar, 2,320 psi, or 25 MPa, 250 bar, 3,625 psi, or 41 MPa, 410 bar, 5,945 psi depending on code variant selected
Carbon fluoride for sensor code C ... R	40 kPa abs., 400 mbar abs., 5.8 psia up to 16 MPa, 160 bar, 2,320 psi, or 25 MPa, 250 bar, 3,625 psi, or 41 MPa, 410 bar, 5,945 psi depending on code variant selected

Test pressure

For pressure testing purposes, the transmitter 265DS can withstand a pressure test applied simultaneously at both sides of up to 1.5 times the nominal pressure (static pressure range) of the transmitter.

3 Environmental limits

Electromagnetic compatibility (EMC)

Conforms to the requirements and tests for EMC Directive 89/336/EC, as well as to EN 61000-6-3 concerning emitted interference and EN 61000-6-2 concerning interference immunity.

Meets NAMUR recommendations.

Low Voltage Directive

Complies with 73/23/EC.

Pressure Equipment Directive (PED)

Instruments with a maximum operating pressure of 25 MPa, 250 bar, 3,625 psi, or 41 MPa, 410 bar, 5,945 psi, comply with Directive 97/23/EC Category III, module H.

Humidity

Relative humidity: Up to 100 %

Condensation, icing: Permissible

Vibration resistance

Acceleration up to 2 g at frequencies up to 1,000 Hz (according to IEC 60068-2-6).

Shock resistance (acc. to IEC 60068-2-27)

Acceleration: 50 g

Duration: 11 ms

Protection type (humid and dusty atmospheres)

The transmitter is dust and sand-tight, and is protected against immersion effects as defined by the following standards:

- IEC EN 60529 (1989) with IP 67 (with IP 68 on request)
- NEMA 4X
- JIS C0920

Protection type with plug connection: IP 65

4 Potentially explosive atmospheres

Transmitter with "Intrinsically safe EEx ia" type of explosion protection in accordance with Directive 94/9/EC (ATEX)

Transmitter with 4 ... 20 mA output signal and HART communication:

Designation: 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 "Intrinsically safe, EEx ib IIB/IIC" or "Intrinsically safe, EEx ia IIB/IIC" type of explosion protection, for connection to supply units with the following 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

Temperature class T4:

$U_i = 30 \text{ V}$

$I_i = 200 \text{ mA}$

$P_i = 0.8 \text{ W}$ for T4 where $T_a = -40 \dots 85 \text{ °C}$

$P_i = 1.0 \text{ W}$ for T4 where $T_a = -40 \dots 70 \text{ °C}$

For temperature class T6:

$P_i = 0.7 \text{ W}$ for T6 where $T_a = -40 \dots 40 \text{ °C}$

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

Effective internal inductance: $L_i \approx 0$

Fieldbus transmitter (PROFIBUS PA / FOUNDATION Fieldbus):

Designation: FISCO field device
II 1/2G Ex ia IIC T6 or T4
II 1/2D Ex iaD 20 T50 °C or T95 °C

Power supply and signal circuit with "Intrinsically safe" type of explosion protection, only for connection to supply units certified according to the FISCO concept and with the following maximum values:

$U_i = 17.5 \text{ V}$

$I_i = 500 \text{ mA}$

$P_i = 8.75 \text{ W}$

or connection to supply units or barriers with linear characteristics.

Maximum values:

$U_i = 24 \text{ V}$

$I_i = 250 \text{ mA}$

$P_i = 1.2 \text{ W}$

Effective internal inductance: $L_i = 10 \text{ } \mu\text{H}$,

Effective internal capacitance: $C_i = 5 \text{ nF}$

Permissible ambient temperature range depending on temperature class:

Temperature class	Lower limit of ambient temperature	Upper limit of ambient temperature
T4	-40 °C (-40 °F)	85 °C (185 °F)
T5, T6	-40 °C (-40 °F)	40 °C (104 °F)

Category 3 transmitter for use in "Zone 2" as defined by Directive 94/9/EC (ATEX)

Transmitter with 4 ... 20 mA output signal and HART communication:

Designation: 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 ±):

$U \leq 45 \text{ V}$

$I \leq 22.5 \text{ mA}$

Ambient temperature range:

Temperature class T4: $T_a = -40 \dots 85 \text{ °C}$

Temperature class T5 and T6: $T_a = -40 \dots 40 \text{ °C}$

Transmitter with "Flameproof EEx d" type of explosion protection in accordance with Directive 94/9/EC (ATEX)

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

Designation: II 1/2 G EEx d IIC T6

Operating conditions:

Ambient temperature range: $-40 \dots 75 \text{ °C}$

Transmitter with "Intrinsically safe EEx ia" type of explosion protection in accordance with Directive 94/9/EC (ATEX), or

"Flameproof EEx d" type of explosion protection in accordance with Directive 94/9/EC (ATEX), or

"Limited energy EEx nL" type of explosion protection in accordance with Directive 94/9/EC (ATEX) (alternative certification)

Transmitter with 4 ... 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 ... 75 °C

or

Identification: II 3 GD T50 °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 ... 20 mA output signal and HART communication:

Intrinsically safe protection

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 installation)

Permissible ambient temperature range depending on temperature class:

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

Fieldbus transmitter (PROFIBUS PA / FOUNDATION Fieldbus):

Intrinsically safe protection:

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 ... 20 mA output signal, HART communication, and fieldbus transmitter (PROFIBUS PA / FOUNDATION Fieldbus):

Explosion-proof protection:

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 installation)

Canadian Standards Association (CSA)

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

Explosion-proof protection:

Class I, Division 1, Groups B, C, D;
 Class II, Division 1, Groups E, F, G

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

Standards Association of Australia (SAA)

Transmitter with "Intrinsically safe EEx ia" and "Non-sparking EEx n" types of protection

Transmitter with 4 ... 20 mA output signal and HART communication:

Identification:

Ex ia IIC T4 ($P_i \leq 0.8 \text{ W}$, $T_a = 85 \text{ }^\circ\text{C}$)/T6 ($P_i \leq 0.7 \text{ W}$, $T_a = 40 \text{ }^\circ\text{C}$)
 Ex n IIC T4 ($T_a = 85 \text{ }^\circ\text{C}$)/T6 ($T_a = 40 \text{ }^\circ\text{C}$)
 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 $T_a = +85 \text{ }^\circ\text{C}$ or
 $P_i = 0.7 \text{ W}$ for T6 where $T_a = +40 \text{ }^\circ\text{C}$

Effective internal capacitance: $C_i = 52 \text{ nF}$

Effective internal inductance: $L_i \approx 0 \text{ mH}$

EEx n installation input parameters:

$U_i = 30 \text{ V}$

Transmitter with "Flameproof Ex d" type of explosion protection

Transmitter with 4 ... 20 mA output signal, 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

NEPSI (China)

Intrinsically safe protection

Transmitter with 4 ... 20 mA output signal and HART communication:

Identification: Ex ia IIC T4/T6

Permissible ambient temperature range depending on temperature class:

Temperature class	Ambient temperature	Pi
T4	-40 ... 85 °C (-40 ... 185 °F)	0.8
T4	-40 ... 70 °C (-40 ... 158 °F)	1.0
T6	-40 ... 40 °C (-40 ... 104 °F)	0.7

Supply and signal circuit for connection to supply units with the following maximum values:

U _{i max} = 30 V, I _{i max} = 200 mA			
Temperature class	P _{i max}	Max. internal parameters	
		C _i (nF)	L _i (µH)
T6	0.7	47	10
T4	0.8	47	10
T4	1.0	47	10

Fieldbus transmitter (PROFIBUS PA / FOUNDATION Fieldbus)

Identification: Ex ia IIB/IIC T4 ... T6

Permissible ambient temperature range depending on temperature class:

Temperature class	Ambient temperature
T4	-40 ... 85 °C (-40 ... 185 °F)
T5	-40 ... 50 °C (-40 ... 122 °F)
T6	-40 ... 40 °C (-40 ... 104 °F)

Supply and signal circuit for connection to supply units with the following maximum values:

Ex mark	Characteristic Supply unit	U _{i max} (V)	I _{i max} (mA)	P _{i max} (W)
Ex ia IIC T4 ... T6	Rectangular or trapezoidal	17.5	360	2.52
Ex ia IIB T4 ... T6	Rectangular or trapezoidal	17.5	380	5.32
Ex ia IIC T4 ... T6	Linear	24	250	1.2
C _{i max} (nF)		L _{i max} (µH)		
0		10		

Explosion-proof protection

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

Identification: Ex d IIC T6

Operating conditions

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

Overfill protection

Model 265DS as part of overfill protection on containers used for storing flammable or non-flammable liquids that are hazardous to water

Flammable liquids	Only in conjunction with EEx ia approval
Total pressure	Up to 4 MPa, 40 bar, 580 psi
Sensor code	C, F, or L
Filling liquid	Silicone oil
Process temperature limits	-40 ... 85 °C (-40 ... 185 °F)
Approval	Z-65.11-271

5 Electrical data and options

5.1 HART digital communication and 4 ... 20 mA output current

Power supply

The transmitter operates at voltages between 10.5 and 45 V DC with no load, and is protected against reverse polarity connection (additional load enables operation above 45 V DC).

With a backlit LCD display, the minimum voltage is 14 V DC.

In the case of the EEx ia version and other intrinsically safe, approved versions, the supply voltage must not exceed 30 V DC.

Ripple

Maximum permissible supply voltage ripple during communication: According to HART FSK "Physical Layer" specification rev. 8.1.

Load limitations

Total loop resistance with 4 ... 20 mA and HART:

$$R(k\Omega) = \frac{\text{Voltage supply} - \text{Minimum operating voltage (VDC)}}{22.5 \text{ mA}}$$



Important

A minimum resistance of 250 Ω is required for HART communication.

LCD display (optional)

19-segment alphanumeric display (two lines, six characters) with additional bar chart display; option of backlighting for customized display of:

- Output current in percent
- Output current in mA
- Freely selectable process variable

Diagnostic messages, alarms, measuring range upper limit violations, and changes to the configuration are also displayed.

Output signal

4 ... 20 mA two-wire output; linear output signal or square root output signal.

Additionally:

- Characteristic with exponents 3/2 or 5/2
 - Horizontal cylindrical container
 - Spherical vessel
 - Freely programmable characteristic with 20 reference points
- HART® communication provides digital process variables (% , mA, or engineering units) superimposed on the 4 ... 20 mA signal (protocol in accordance with Bell 202 FSK standard).

Output current limits (according to NAMUR standard)

Overload condition:

- Lower limit: 3.8 mA (can be configured up to 3.5 mA)
- Upper limit: 20.5 mA (can be configured up to 22.5 mA)

Alarm current

Minimum alarm current:	Can be configured from 3.5 ... 4 mA; default setting: 3.6 mA
Max. alarm current:	Can be configured from 20 ... 22.5 mA; default setting: 21 mA
Default setting:	Maximum alarm current

SIL: Functional safety (optional)

According to IEC 61 508/61 511

Device with certificate of conformity for use in safety-related applications, up to and including SIL 2.

5.2 PROFIBUS PA output

Model

Pressure transmitter conforming to Profile 3.0, Class A and B;
ID number 04C2 HEX

Power supply

The transmitter is operated at 10.2 ... 32 V DC (no polarity).
The supply voltage must not exceed 17.5 V DC when used in EEx ia zones.
Intrinsically safe installation in accordance with FISCO model.

Current consumption

Operating (quiescent): 11.7 mA
Fault current limiting: Maximum 17.3 mA

Output signal

Physical layer in accordance with IEC 1158-2/EN 61158-2;
transmission using Manchester II modulation at 31.25 kbit/sec.

Output interface

PROFIBUS PA communication according to PROFIBUS DP 50170
Part 2 / DIN 19245 Parts 1-3

Output cycle time

40 ms

Function blocks

2 standard analog input function blocks
1 transducer block
1 physical block

LCD display (optional)

19-segment alphanumeric display (two lines, six characters) with
additional bar chart display; option of backlighting.
Customized display:
Output value in percent or OUT (analog input)
Diagnostic messages, alarms, measuring range upper limit violations,
and changes to the configuration are also displayed.

Transmitter interference mode

Permanent self-diagnosis; potential errors indicated in diagnostic
parameters and in the status of process values.

5.3 FOUNDATION fieldbus output

Power supply

The transmitter is operated at 10.2 ... 32 V DC (no polarity).
The supply voltage must not exceed 17.5 V DC when used in EEx ia
zones.
Intrinsically safe installation in accordance with FISCO model.

Current consumption

Operating (quiescent): 11.7 mA
Fault current limiting: Maximum 17.3 mA

Output signal

Physical layer in accordance with IEC 1158-2/EN 61158-2;
transmission using Manchester II modulation at 31.25 kbit/sec.

Function blocks/execution time

2 standard analog input function blocks/maximum 25 ms
1 standard PID function block

Additional blocks

1 manufacturer-specific pressure with calibration transducer block
1 enhanced resource block

Number of link objects

10

Number of VCRs

16

Output interface

FOUNDATION fieldbus digital communication protocol in accordance
with standard H1; complies with specification V. 1.5.
FF registration no.: IT023600

LCD display (optional)

19-segment alphanumeric display (two lines, six characters) with
additional bar chart display; option of backlighting.
Customized display:
Output value in percent or OUT (analog input)
Diagnostic messages, alarms, measuring range upper limit violations,
and changes to the configuration are also displayed.

Transmitter interference mode

Permanent self-diagnosis; potential errors indicated in diagnostic
parameters and in the status of process values.

6 Measuring accuracy

Reference conditions acc. to IEC 60770

- Ambient temperature T_U = Constant, in range: 18 ... 30 °C (64 ... 86 °F)
- Relative humidity = Constant, in range: 30 ... 80 %
- Atmospheric pressure P_U = Constant, in range: 950 ... 1,060 mbar
- Position of measuring cell (isolating diaphragm areas): Vertical $\pm 1^\circ$
- Span based on zero position
- Isolating diaphragm material: Hastelloy C276™
- Filling liquid: Silicone oil
- Supply voltage: 24 V DC
- Load with HART: 250 Ω
- Transmitter not grounded
- Characteristic setting: Linear, 4 ... 20 mA

Unless otherwise specified:

- The reference conditions apply for the following performance characteristics.
- Errors are given as a percentage of the span value.

The accuracy of the measurement in relation to the upper range limit (URL) is affected by the turndown (TD); i.e., the ratio of the upper range limit (URL) to the set span (URL/span).

i Important

Select the transmitter sensor with the smallest possible turndown. This optimizes the accuracy of the measurement.

Dynamic behavior (according to IEC 61298-1)

Devices with standard configurations and a turndown of up to 30:1, plus linear output characteristics.

Reaction time:	30 ms
Time constant (63 %)	150 ms (sensors F to R) 400 ms (sensor C) 1,000 ms (sensor A)

Measuring error (for terminal based conformity)

Percentage of set span, consisting of non-linearity, hysteresis, and non-reproducibility.

In the case of fieldbus devices, SPAN refers to the analog input function block output scale range.

Measuring error for differential pressure sensor

Turndown	Measuring error
1:1 to 10:1	± 0.04 %
>10:1	$\pm (0.04 + 0.005 \times TD - 0.05)$ %

Measuring error for absolute pressure sensor

	Measuring error
-	80 kPa, 800 mbar, 321 in H ₂ O
For sensor code A with absolute pressure sensor 0.6 kPa, 6 bar, 87 psi	1.2 kPa, 12 mbar, 4.8 in H ₂ O

7 Operating influences

Thermal change in ambient temperature on the zero signal and span (turndown up to 15:1), in relation to the set span

Differential pressure sensor:

Range	Maximum effect on zero signal and span
-10 ... 60 °C (14 ... 140 °F)	± (0.06 % x TD + 0.05 %)
-40 ... -10 °C (-40 ... 14 °F) and 60 ... 80 °C (140 ... 176 °F)	± (0.025 % / 10 K x TD + 0.03 % / 10 K)

Absolute pressure sensor

For the entire temperature range of 120 K

– Zero signal

For sensors C, F, L, N, R:

40 kPa, 400 mbar, 160 in H₂O

(absolute pressure sensor 41MPa, 410bar, 5,945 psi)

For sensor A:

0.6 kPa, 6 mbar, 2.4 in H₂O

(absolute pressure sensor 0.6 MPa, 6 bar, 87 psi)

– Span

For sensors C, F, L, N, R:

0.3 kPa, 3 bar, 43.5 psi

(absolute pressure sensor 41 MPa, 410 bar, 5,945 psi)

For sensor A:

4.5 kPa, 45 mbar, 18 in H₂O

(absolute pressure sensor 0.6 MPa, 6 bar, 87 psi)

Static pressure (zero signal errors may be calibrated out at operating pressure)

Measuring range	Sensor A	Sensor C, F, L, N	Sensor R
Zero signal	Up to 2 bar: 0.05 % URL	Up to 100 bar: 0.05 % URL	Up to 100 bar: 0.1 % URL
	> 2 bar: 0.05 % URL/bar	> 100 bar: 0.05 % URL/100 bar	> 100 bar: 0.1 % URL/100 bar
Span	Up to 2 bar: 0.05 % span	Up to 100 bar: 0.05 % span	Up to 100 bar: 0.1 % span
	> 2 bar: 0.05 % span/bar	> 100 bar: 0.05 % span/100 bar	> 100 bar: 0.1 % span/100 bar

Power supply

Within the specified limits for the voltage/load, the total effect is less than 0.001 % of the upper range limit per volt.

Load

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

Electromagnetic fields

Total effect: Less than 0.05 % of span between 80 and 1,000 MHz and at field strengths of up to 10 V/m, when tested with unshielded cables, and either with or without a display.

Installation position

Rotations in the plane of the diaphragm have a negligible effect. A tilt from the vertical causes a zero position shift of $\sin \alpha \times 0.35$ kPa (3.5 mbar, 1.4 in H₂O) of the upper range limit, which can be corrected using an appropriate zero position adjustment. There is no effect on the span.

Long-term stability

Sensor code C ... R:

± (0.05 x TD) % / year

± (0.15 x TD) % / 5 years

Sensor code A:

± (0.2 x TD) % / year

± (0.3 x TD) % / 5 years

Vibration effect

±0.10 % of upper range limit (according to IEC 61298-3)

Base accuracy (Total performance)

Temperature change in the range -10 ... 60 °C (14 ... 140 °F), up to 10 MPa, 100 bar, 1,450 psi static pressure (sensors C ... R):

± 0.13 % of the set span (TD 1:1)

The base accuracy (Total performance) includes the measurement deviation (non-linearity including hysteresis and non-reproducibility), the thermal change in the ambient temperature on the zero signal and span, as well as the effect of the static pressure on the zero signal and span.

$$E_{perf} = \sqrt{(E_{\Delta s1} + E_{\Delta s2})^2 + E_{Pstat1}^2 + E_{Pstat2}^2 + E_{lin}^2}$$

E_{perf} = Base accuracy

$E_{\Delta s1}$ = Effect of the ambient temperature on the zero signal

$E_{\Delta s2}$ = Effect of the ambient temperature on the span

E_{Pstat1} = Effect of the static pressure on the zero signal

E_{Pstat2} = Effect of the static pressure on the span

E_{lin} = Measuring error (for terminal-based conformity)

For differential pressure, selectable maximum operating pressure up to 41 MPa, 5,945 psi

8 Technical specification



Important

Refer to the ordering information to check the availability of different versions of the relevant model.

Materials

Isolating diaphragms ¹⁾	Hastelloy C276™; stainless steel (1.4435); Monel 400™; Tantal
Process flange, adapter, plugs, and drain/vent valves ¹⁾	Hastelloy C276™; stainless steel (1.4404); Monel 400™; Kynar (PVDF)
Sensor filling liquid	Silicone oil, inert filling (carbon fluoride)
Sensor housing	Stainless steel (316L/1.4404)
Mounting bracket	Stainless steel
Seals ¹⁾	Viton™ (FPM) color: Green; Buna (NBR) color: Black; EPDM color: Black; PTFE color: White (for sensors C, F, L, N, R) or PEP-coated Viton™ Color: Gray (for sensor A)
Screws and nuts	Stainless steel Class A4-70 screws and nuts to ISO 3506, in compliance with NACE MR0175 Class II
Electronics housing and cover	Barrel design <ul style="list-style-type: none"> Aluminium alloy with low copper content (< 0.1 %), baked epoxy finish Stainless steel (316L / 1.4404) DIN design <ul style="list-style-type: none"> Aluminium alloy with low copper content (< 0.1 %), baked epoxy finish
O-ring cover	Viton™
Local zero and span adjustments	Fiber glass-reinforced polycarbonate plastic (removable), no adjustment options for stainless steel housings
Name plate	Stainless steel (304/1.4301) or plastic data plate attached to the electronics housing

™ Hastelloy is a Cabot Corporation trademark.

™ Monel is an International Nickel Co. trademark.

™ Viton is a DuPont de Nemours trademark.

¹⁾ Transmitter wetted parts

Calibration

Standard:	0 to upper range limit (URL) for ambient temperature and atmospheric pressure
Optional:	To specified span

Optional accessories

Mounting bracket	For vertical and horizontal 60 mm (2") pipes or wall mounting
LCD display	Pluggable and rotatable design
Additional tag plate, e. g. for marking measuring points	Tag with wire (both stainless steel) attached to the transmitter, with a maximum of 30 characters including spaces
Lightning protection	Up to 4 kV <ul style="list-style-type: none"> Voltage pulses: 1.2 µs rise time; 50 µs delay time at half value Current pulses: 8 µs rise time; 20 µs delay time at half value Not available for devices with ATEX-EEx nL or PROFIBUS PA/FOUNDATION fieldbus featuring ATEX-EEx i or FM intrinsically safe designs.

Oil- and grease-free for oxygen applications

Preparation for hydrogen applications

Certificates (test, design, characteristics, material traceability)

Process connections

Flange:

1/4-18 NPT on the process axis; can be selected with 7/16-20 UNF fastening screw thread, DIN 19213 connection with M10 fastening screw thread for operating pressures of up to 16 MPa, 160 bar, 2,320 psi or M12 fastening screw thread for higher operating pressures of up to 41 MPa, 410 bar, 6,000 psi.

Adapter:

1/2-14 NPT on the process axis. Center distance between flanges: 54 mm (2.13 inch); 51, 54, or 57 mm (2.01, 2.13, or 2.24 inch) for adapter fittings.

Electrical connections

Two 1/2 - 14 NPT or M20 x 1.5 threaded bores for cable glands directly on housing, or plug connector

- HART: Straight or angled Harting Han 8D (8U) connector and one mating plug
- FOUNDATION Fieldbus / PROFIBUS PA; 7/8" plug / M12 x 1

Terminals

HART version: Four terminals for signal/external display, for wire cross sections of up to 2.5 mm² (14 AWG), and four connection points for testing and communication purposes.

Fieldbus versions: Two signal terminals (bus connection) for wire cross sections of up to 2.5 mm² (14 AWG).

Grounding

Internal and external ground terminals for wire cross sections of up to 4 mm² (12 AWG) are provided.

Installation position

The transmitter can be installed in any position. The electronics housing may be rotated 360°. A stop is provided to prevent overtravel.

Weight (without options)

Approximately 3.5 kg (7.72 lb); additional 1.5 kg (3.31 lb) for stainless steel housing

Packaging adds 0.65 kg (1.43 lb)

Packaging

Carton with dimensions of approx. 230 x 250 x 270 mm (9.06 x 9.84 x 10.63 inches).

9 Configuration

9.1 Transmitter with HART communication and 4 ... 20 mA output current

Standard configuration

Transmitters are calibrated at the factory to the customer's specified measuring range. The calibrated range and measuring point number are provided on the name plate. If this data has not been specified, the transmitter will be delivered with the following configuration:

4 mA	Zero position
20 mA	Upper range limit (URL)
Output	Linear
Damping	0.125 sec.
Transmitter failure mode	21 mA
Optional LCD display	0 ... 100 % linear

Any or all of the configurable parameters listed above - including the upper and lower range limit values - can easily be changed using a portable HART handheld communicator or a PC running the configuration software SMART VISION with DTM for 2600T. Data regarding flange type and material, O-ring materials, and type of filling liquid is stored in the device.

9.2 Transmitter with PROFIBUS PA communication

Transmitters are calibrated at the factory to the customer's specified measuring range. The calibrated range and measuring point number are provided on the name plate. If this data has not been specified, the transmitter will be delivered with the following configuration:

Measuring profile	Pressure
Engineering unit	mbar/bar
Output scale 0 %	Lower range limit (LRL)
Output scale 100 %	Upper range limit (URL)
Output	Linear
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)
Hysteresis limit value	0.5 % of output scale
PV filter	0.125 sec.
Address	126

Any or all of the configurable parameters listed above - including the upper and lower range limit values - can easily be changed using a PC running the configuration software SMART VISION with DTM for 2600T. Data regarding flange type and material, O-ring materials, and type of filling liquid is stored in the device.

9.3 Transmitter with FOUNDATION fieldbus communication

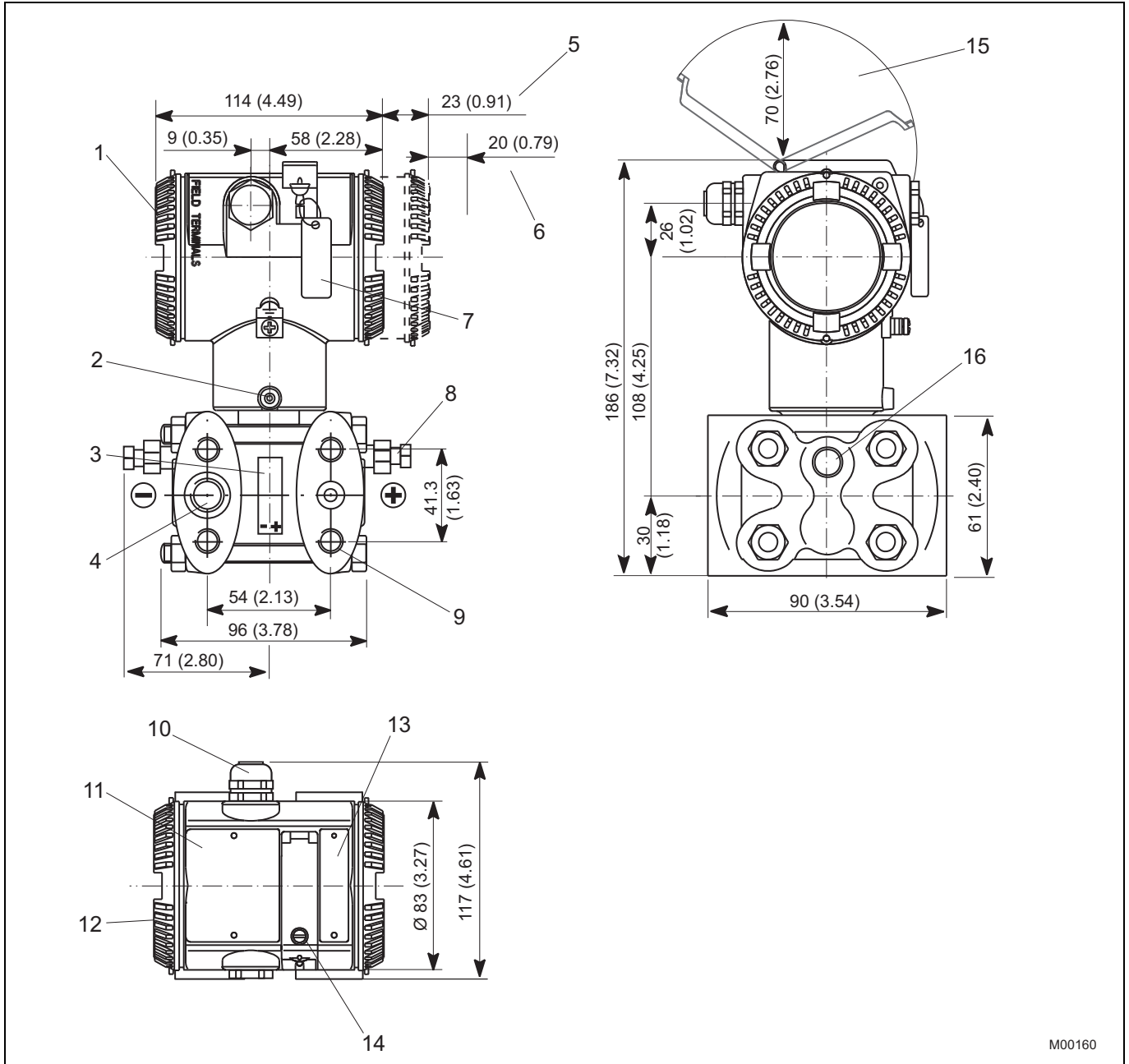
Transmitters are calibrated at the factory to the customer's specified measuring range. The calibrated range and measuring point number are provided on the name plate. If this data has not been specified, the transmitter will be delivered with the following configuration:

Measuring profile	Pressure
Engineering unit	mbar/bar
Output scale 0 %	Lower range limit (LRL)
Output scale 100 %	Upper range limit (URL)
Output	Linear
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)
Hysteresis limit value	0.5 % of output scale
PV filter	0.125 sec.
Address	Not required

Any or all of the configurable parameters listed above - including the upper and lower range limit values - can be changed using FOUNDATION Fieldbus compatible configuration tool. Data regarding flange type and material, O-ring materials, and type of filling liquid is stored in the device.

10 Mounting dimensions (not design data)

10.1 Transmitter with barrel housing

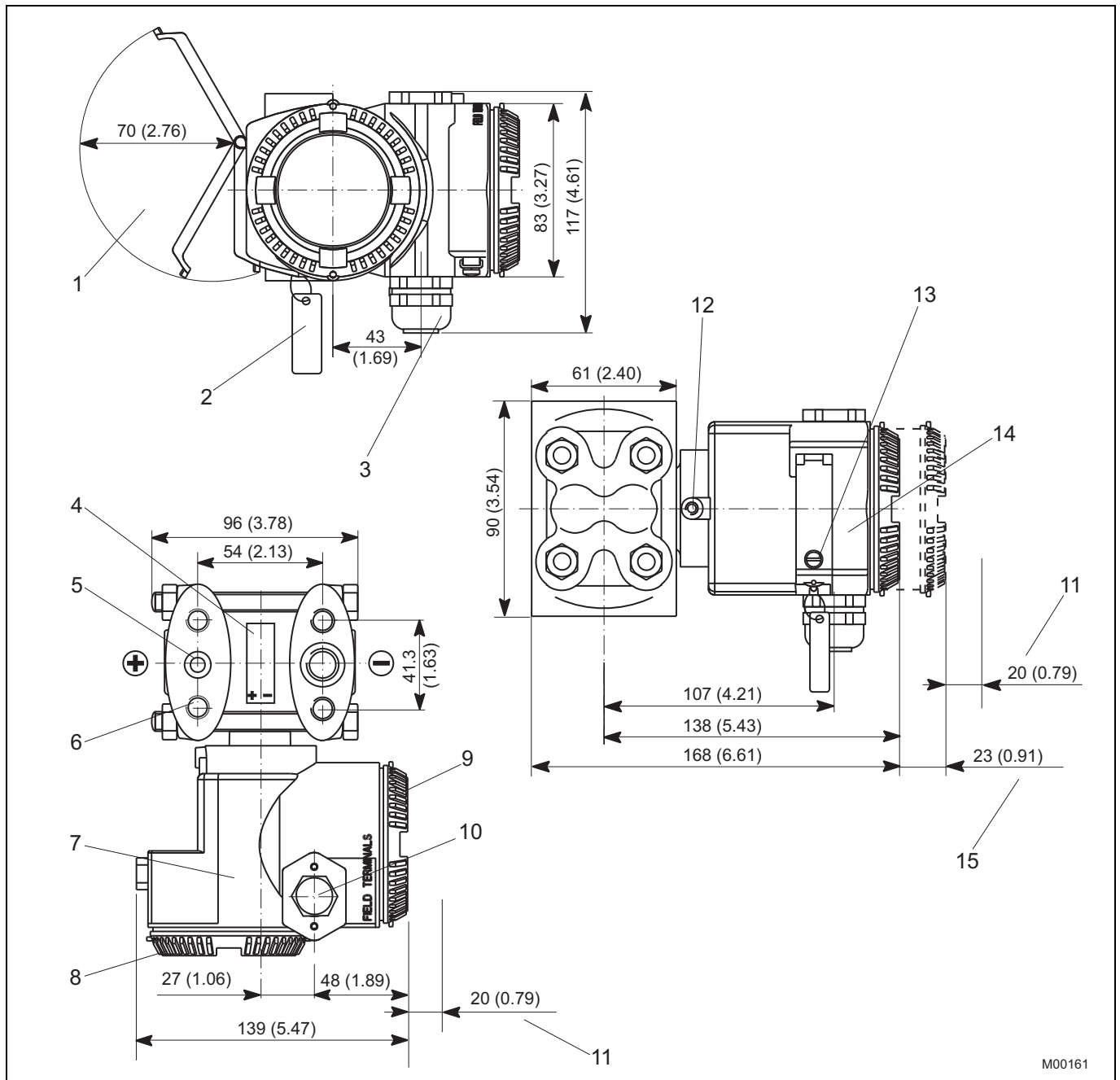


M00160

Fig. 1: Dimensions in mm (inches), deviations in the drawing are possible

- | | |
|---|---|
| 1 Terminal side | 10 Electrical connection |
| 2 Housing stop-screw | 11 Name plate |
| 3 Sensor plate | 12 Housing cover |
| 4 Process connection (conforms to IEC 61518) | 13 Plate with key legend, etc. |
| 5 With LCD display | 14 Captive fixing screw for keyboard cover |
| 6 Space for removing the cover required | 15 Space for rotating the keyboard cover required |
| 7 Additional tag plate, e. g. for marking measuring points (optional) | 16 Upper or lower threaded bore (optional); 1/4-18 NPT for drain/vent valve |
| 8 Drain/vent valve (optional) | |
| 9 Thread for fixing screws
(see "Process connections" data) | |

10.2 Transmitter with DIN housing



M00161

Fig. 2: Dimensions in mm (inches), deviations in the drawing are possible

- | | |
|---|--|
| 1 Space for rotating the keyboard cover required | 8 Housing cover |
| 2 Additional tag plate, e. g. for marking measuring points (optional) | 9 Terminal side |
| 3 Electrical connection | 10 Electrical connection (blind plug) |
| 4 Sensor plate | 11 Space for removing the cover required |
| 5 Process connection (conforms to IEC 61518) | 12 Housing stop-screw |
| 6 Thread for fixing screws
(see "Process connections" data) | 13 Captive fixing screw for keyboard cover |
| 7 Name plate | 14 Plate with key legend, etc. |
| | 15 With LCD display |

10.3 Mounting options with bracket

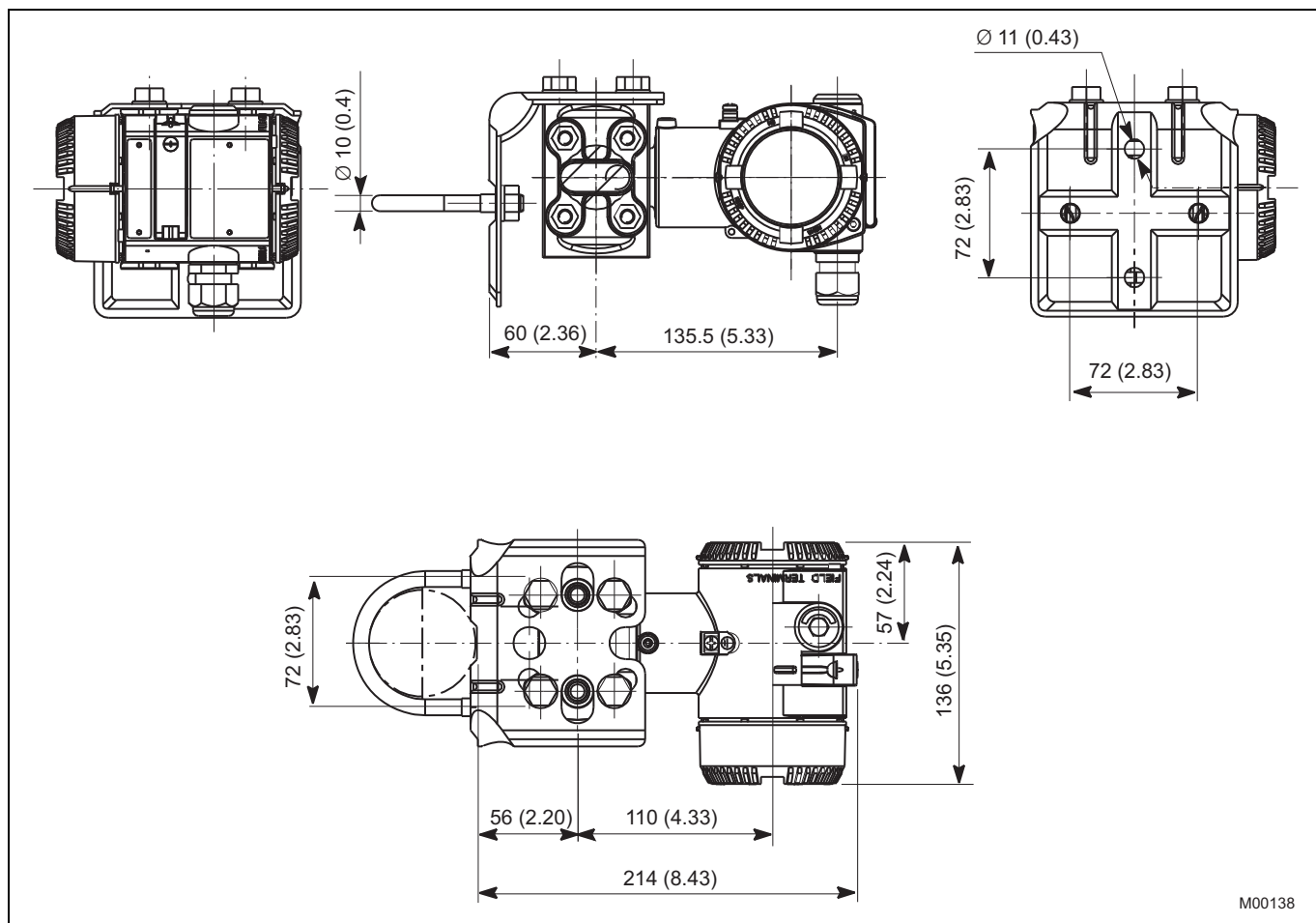


Fig. 3: Dimensions in mm (inches), deviations in the drawing are possible

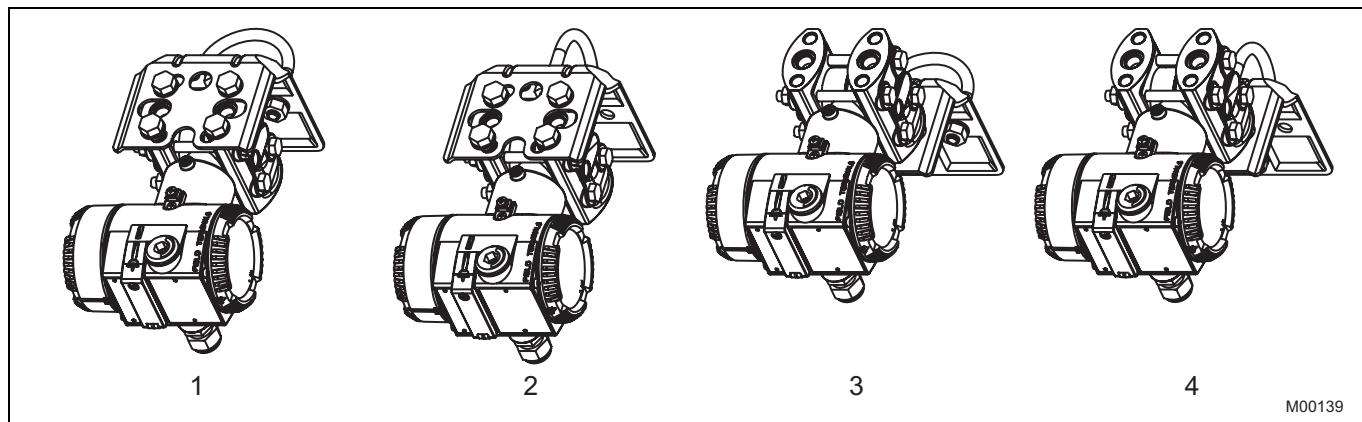


Fig. 4: Deviations in the drawing are possible

- 1 Vertical pipe mounting
- 2 Horizontal pipe mounting
- 3 Vertical pipe mounting and transmitter above the mounting bracket
- 4 Horizontal pipe mounting and transmitter above the mounting bracket

11 Electrical connections

11.1 Standard terminal strip

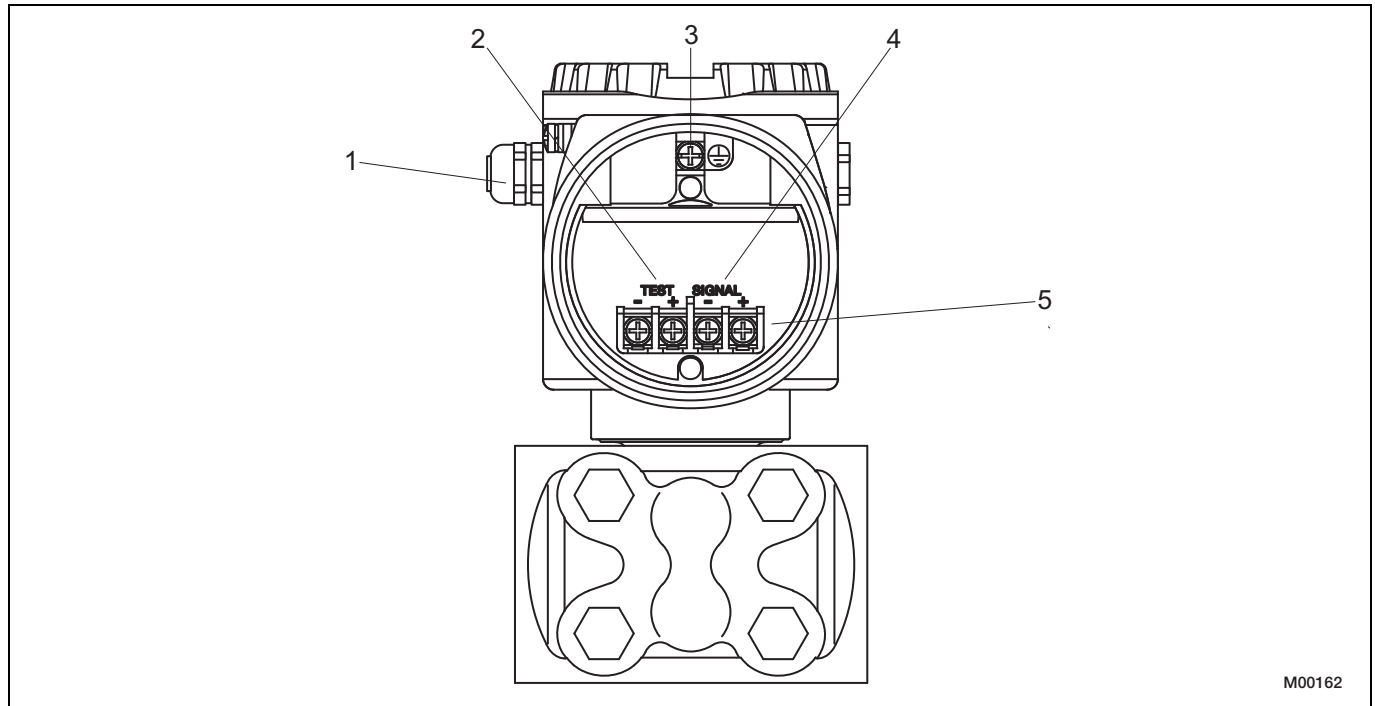


Fig. 5

- | | |
|---|---|
| 1 Cable entry | 4 Output signal / power supply |
| 2 Test terminals for 4 ... 20 mA (not with fieldbus transmitters) | 5 Screw terminals for leads with cross section of 0.5 ... 2.5 mm ² (AWG 20 ... AWG 14) |
| 3 Ground/equipotential bonding terminal | |

11.2 Fieldbus plug connector



Fig. 6

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

Mating plug (socket) not supplied

11.3 Harting Han 8D (8U) plug connector

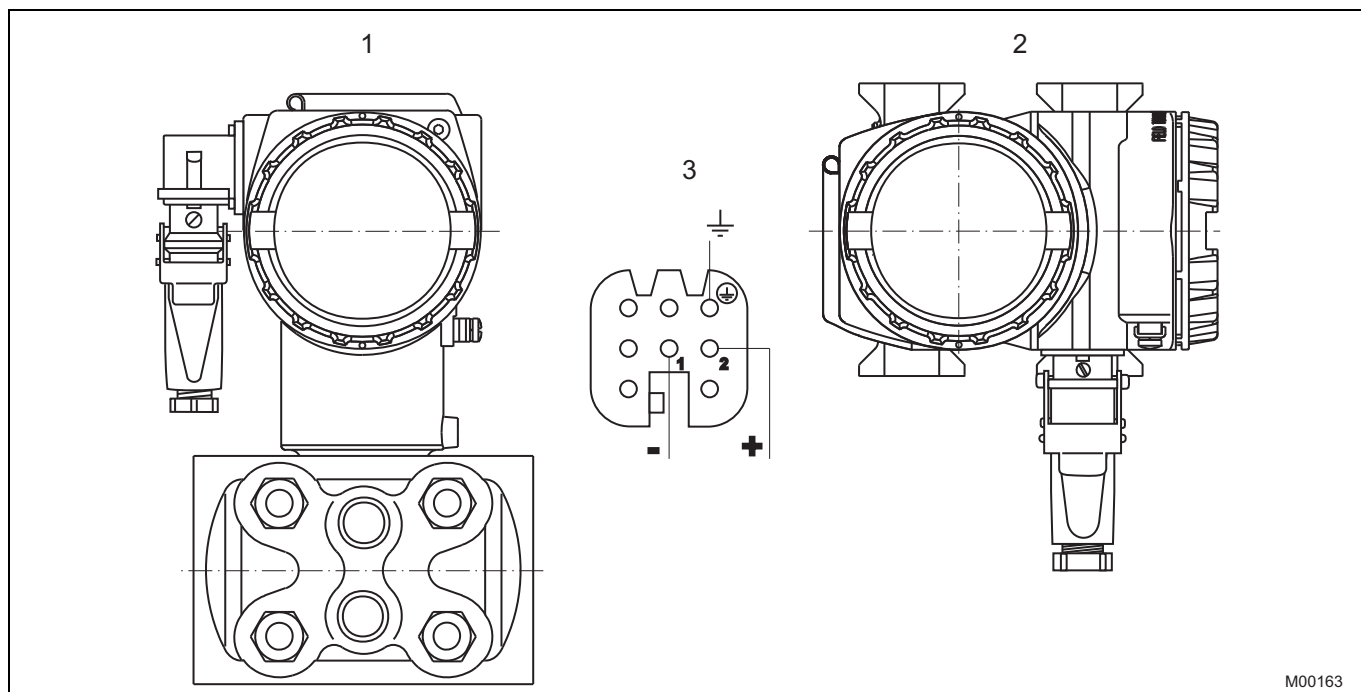


Fig. 7

- 1 Barrel housing
- 2 DIN housing

- 3 Harting Han 8D (8U) socket insert for mating plug supplied (view of sockets)

For differential pressure, selectable maximum operating pressure up to 41 MPa, 5,945 psi

12 Ordering information

Variant digit No.	Main Catalog No.										Additional Catalog No.	
	1 - 5	6	7	8	9	10	11	12	XX			
Differential Pressure Transmitter, Static Pressure up to 41 MPa / 410 bar / 5945 psi, Base Accuracy 0.04 %	265DS	X	X	X	X	X	X	X	X	X	X	XX
Sensor - Span Limits												
0.05 ... 1 kPa / 0.5 ... 10 mbar / 0.2 ... 4 in. H2O		A										
0.2 ... 6 kPa / 2 ... 60 mbar / 0.8 ... 24 in. H2O		C										
0.4 ... 40 kPa / 4 ... 400 mbar / 1.6 ... 160 in. H2O		F										
2.5 ... 250 kPa / 25 ... 2500 mbar / 10 ... 1000 in. H2O		L										
20 ... 2000 kPa / 0.2 ... 20 bar / 2.9 ... 290 psi		N										
100 ... 10000 kPa / 1 ... 100 bar / 14.5 ... 1450 psi		R										
Static Pressure												
0.6 MPa / 6 bar / 87 psi		1) M										
1 MPa / 10 bar / 145 psi		2) Y										
16 MPa / 160 bar / 2320 psi		2) C										
25 MPa / 250 bar / 3625 psi		2) Z										
41 MPa / 410 bar / 5945 psi		2) T										
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			3) A									
Hastelloy C-276 / Inert Fluid, NACE			3) F									
Monel 400 / Inert Fluid, NACE			3) C									
Monel 400 Gold-plated / Inert Fluid, NACE			3) Y									
Tantalum / Inert Fluid, NACE			3) D									
Process Connection Material / Process Connection												
AISI 316L SST (1.4404 / 1.4408) //(horizontal) 1/4-18 NPT-f direct, NACE					A							
AISI 316L SST (1.4404 / 1.4408) //(horizontal) 1/4-18 NPT-f direct (DIN 19213), NACE					C							
AISI 316L SST (1.4404 / 1.4408) //(horizontal) 1/2-14 NPT-f through Adapter, NACE					B							
Hastelloy C-276 (horizontal) / 1/4-18 NPT-f direct, NACE					D							
Hastelloy C-276(horizontal) / 1/2-14 NPT-f through Adapter, NACE					E							
Monel 400 (horizontal) / 1/4-18 NPT-f direct, NACE					G							
Monel 400 (horizontal) / 1/2-14 NPT-f through Adapter, NACE					H							
Kynar (PVDF) / (side axial) 1/4-18 NPT-f direct (SWP max. 1 MPa, 10 bar)					P							
AISI 316L SST (1.4404 / 1.4408) / (vertical) 1/4-18 NPT-f direct, NACE					Q							
Bolts / Gaskets												
AISI 316L SST / Viton, NACE					3)	3						
AISI 316L SST / PTFE, NACE (max. 25 MPa)						4						
AISI 316L SST / EPDM, NACE						5						
AISI 316L SST / Perbunan						6						
AISI 316L SST / Graphite						7						

- 1) Only with sensor code A
- 2) Not with sensor code A
- 3) Suitable for Oxygen Applications

Continued on next page

For differential pressure, selectable maximum operating pressure up to 41 MPa, 5,945 psi

Main Catalog No.												Additional Catalog No.
Variant digit No.	1 - 5	6	7	8	9	10	11	12				
Differential Pressure Transmitter, Static Pressure up to 41 MPa / 410 bar / 5945 psi, Base Accuracy 0.04 %												XX
265DS												XX
Electronic Housing Material / Electrical Connection												
Aluminium Alloy (Barrel Type) / 1/2-14 NPT												A
Aluminium Alloy (Barrel Type) / M20 x 1.5												4) B
Aluminium Alloy (Barrel Type) / Harting Han Connector												5) E
Aluminium Alloy (Barrel Type) / Fieldbus Connector												6) G
AISI 316L SST (Barrel Type) / 1/2-14 NPT												S
AISI 316L SST (Barrel Type) / M20 x 1.5												4) T
Aluminium Alloy (DIN Type) / M20 x 1.5												4) J
Aluminium Alloy (DIN Type) / Harting Han Connector												5) K
Aluminium Alloy (DIN Type) / Fieldbus Connector												6) W
Output												
HART Digital Communication and 4 ... 20 mA												7) H
HART Digital Communication and 4 ... 20 mA												8) 1
PROFIBUS PA												7) P
PROFIBUS PA												8) 2
FOUNDATION Fieldbus												7) F
FOUNDATION Fieldbus												8) 3
Vent Valve Material / Position												
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
Explosion Protection Certification												
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
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												9) EB
Canadian Standard Association (CSA)– Explosion Proof												EE
Canadian Standard Association (CSA)– 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
SAA Ex d IIC T6 and Ex td A21 IP 66 T85 °C												X1
SAA Ex ia IIC T4/T6 and Ex n IIC T4/T6												X2

- 4) Not available with FM, CSA
- 5) Not available with EExnL, EExd, FM, CSA
- 6) Not with EEx nL, EEx d, FM- / CSA- / NEPSI-Explosion Proof
- 7) No Additional Options
- 8) Options requested (to be ordered by Additional Ordering Code)
- 9) Only with Electrical Connection 1/2-14 NPT and Stainless Steel Tag Plate

Continued on next page

For differential pressure, selectable maximum operating pressure up to 41 MPa, 5,945 psi

	Main Catalog No.								Additional Catalog No.
	1 - 5	6	7	8	9	10	11	12	XX
	265DS	X	X	X	X	X	X	X	XX
Integrated Digital Display (LCD) With integrated LCD Display With integrated LCD Display (Backlit)									L1 L2
Mounting Bracket Shape / Material For Pipe Mounting / AISI 304 SST (1.4301) For Wall Mounting / AISI 304 SST (1.4301)									B2 B4
Surge Protector Surge / Transient Protector								10)	S1
Operating Manual German Spanish French Swedish Russian									M1 M3 M4 M7 MB
Label and Tag Language / Material German / Stainless Steel German and English / Plastic								11) 12)	T1 TA
Additional Tag Plate Stainless Steel									I1
Applications: Oxygen Oil- and Grease-free for Oxygen Applications (O2), (Pmax = 120 bar, Tmax = 60 °C)								13)	P1
Applications: Hydrogen Hydrogen Application (H2) (Fluid Film)									P2
Connector Fieldbus 7/8 in. (without Mating Plug, recommended for FOUNDATION Fieldbus) Fieldbus M12 x 1 (without Mating Plug, recommended for PROFIBUS PA) Harting Han 8D (8U) - Straight Entry Harting Han 8D (8U) - Angle Entry									U1 U2 U3 U4
Output Characteristic Square Root Characteristic									224
Material: 2.1 Compliance Certificate of Compliance with the Order EN 10204-2.1 of Process Wetted Parts									H1
Material: 3.1 Inspection Inspection Certificate EN 10204-3.1 of the pressure-bearing and process wetted parts with analysis certificates as material verification								14)	H3
Material: 2.2 Test Report Test Report EN 10204-2.2 of the Pressure Bearing and Process Wetted Parts									H4
Certificates: 3.1 Calibration Inspection Certificate EN 10204-3.1 of Calibration									C1
Certificates: 3.1 Cleanliness Stage Inspection Certificate EN 10204-3.1 of the Cleanliness Stage									C3
Certificates: 3.1 Helium Leakage Test Inspection Certificate EN 10204-3.1 of Helium Leakage Test of the Sensor Module									C4
Certificates: 3.1 Pressure Test Inspection Certificate EN 10204-3.1 of the Pressure Test									C5

10) Not with ATEX-EEx nL (Code E3), not with PROFIBUS PA / FOUNDATION Fieldbus (Code 2, 3) with Intrinsic Safety EEx ia (Code E1, EY), not with FM Intrinsically Safe (Code EA) a. SAA (Code X2)

11) Not available with DIN Electronic Housing Code J, K, W

12) Not available with Factory Mutual - Explosion Proof

13) Pmax = 12 MPa, Tmax. = 60 °C

14) Minor Parts with Factory Certificate acc. to EN 10204

Continued on next page

For differential pressure, selectable maximum operating pressure up to 41 MPa, 5,945 psi

Main Catalog No.								Additional Catalog No.
1 - 5	6	7	8	9	10	11	12	XX
265DS	X	X	X	X	X	X	X	XX
Certificates: 2.1 Instrument Design								
Certificate of Compliance with the Order EN 10204-2.1 of Instrument Design								C6
Certificates: DNV / Germanischer Lloyd								
DET NORSKE VERITAS Approval								C7
Germanischer Lloyd Approval								C8
Certificates: Overfill Protection								
Overfill Protection								15) C9
Certificates: SIL2								
SIL2 - Declaration of Conformity								CL
Certificates: GOST								
GOST (Russia) without explosion protection								WC
GOST (Kazakhstan) without explosion protection								WD
GOST (Ukraine) without explosion protection								WE

15) Not with sensor code A, N, R

13 Standard scope of delivery (changes may be made by using additional ordering code)

- Adapters supplied loose
- Plugs for process axis (no drain/vent valves)
- For general-purpose applications (no Ex applications)
- No display, no mounting bracket, no lightning protection
- English-language operating instructions and labels
- Name 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

Unless otherwise specified prior to manufacture, the customer shall be responsible for the selection of suitable wetted parts and appropriate fill fluid to assure compatibility with the relevant process medium.

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