

# Model 266DSH Differential

Engineered solutions for all applications

Measurement made easy



#### Base accuracy

- from 0.06 % of calibrated span (optional 0.04 %)

#### Reliable sensing system coupled with very latest digital technologies

- provides large turn down ratio up to 100:1

#### Comprehensive sensor choice

- optimize in-use total performance and stability

#### 10-year stability

- 0.15 % of URL

#### Flexible configuration facilities

- provided locally via local LCD keypad

#### New TTG (Through-The-Glass) keypad technology

- allows quick and easy local configuration without opening the cover, even in explosion proof environments

#### IEC 61508 certification

- version for SIL2 (1oo1) and SIL3 (1oo2) applications

#### PED compliance

- Category III for PS > 20 MPa, 200 bar
- Sound Engineering Practice (SEP) for PS ≤ 20 MPa, 200 bar

#### WirelessHART version

- the battery powered solution compliant to IEC 62591

#### Best-in-class battery life

- up to 10 years @ 32 s update time
- in-field replaceable

# Model 266DSH Differential

## Functional Specifications

### Range and span limits

Sensor Code	Upper Range Limit (URL)	Lower Range Limit (LRL)	Minimum span
A	1 kPa	-1 kPa	0.05 kPa
	10 mbar	-10 mbar	0.5 mbar
	4 inH <sub>2</sub> O	-4 inH <sub>2</sub> O	0.2 inH <sub>2</sub> O
B	4 kPa	-4 kPa	0.2 kPa
	40 mbar	-40 mbar	2 mbar
	16 inH <sub>2</sub> O	-16 inH <sub>2</sub> O	0.8 inH <sub>2</sub> O
E	16 kPa	-16 kPa	0.54 kPa
	160 mbar	-160 mbar	5.4 mbar
	64 inH <sub>2</sub> O	-64 inH <sub>2</sub> O	2.16 inH <sub>2</sub> O
F	40 kPa	-40 kPa	0.4 kPa
	400 mbar	-400 mbar	4 mbar
	160 inH <sub>2</sub> O	-160 inH <sub>2</sub> O	1.6 inH <sub>2</sub> O
H	160 kPa	-160 kPa	1.6 kPa
	1600 mbar	-1600 mbar	16 mbar
	642 inH <sub>2</sub> O	-642 inH <sub>2</sub> O	6.4 inH <sub>2</sub> O
M	600 kPa	-600 kPa	6 kPa
	6 bar	-6 bar	0.06 bar
	87 psi	-87 psi	0.87 psi
P	2400 kPa	-2400 kPa	24 kPa
	24 bar	-24 bar	0.24 bar
	348 psi	-348 psi	3.5 psi
Q	8000 kPa	-8000 kPa	80 kPa
	80 bar	-80 bar	0.8 bar
	1160 psi	-1160 psi	11.6 psi
S	16000 kPa	-16000 kPa	160 kPa
	160 bar	-160 bar	1.6 bar
	2320 psi	-2320 psi	23.2 psi

(§) Lower Range Limit is 0.135 kPa abs, 1.35 mbar abs, 1 mmHg for inert Galden or 0.4 kPa abs, 4 mbar abs, 3 mmHg for inert Halocarbon.

### Span limits

Maximum span = URL (can be further adjusted up to  $\pm$  URL (TD = 0.5) for differential models, within the range limits)  
IT IS RECOMMENDED TO SELECT THE TRANSMITTER SENSOR CODE PROVIDING THE TURNDOWN VALUE AS LOWEST AS POSSIBLE TO OPTIMIZE PERFORMANCE CHARACTERISTICS.

### Zero suppression and elevation

Zero and span can be adjusted to any value within the range limits detailed in the table as long as:  
– calibrated span  $\geq$  minimum span

### Recommendation for square root function

At least 10% of Upper Range Limit (URL)

### Damping (feature not available for WirelessHART version)

Selectable time constant : between 0 and 60 s  
This is in addition to sensor response time.

### Turn on time

Operation within specification in less than 10 s with minimum damping.

### Insulation resistance

> 100 M $\Omega$  at 500 V DC (terminals to earth)

## Operative limits

### Pressure limits:

#### Overpressure limits

Without damage to the transmitter

Sensors	Fill fluid	Overpressure limits
Sensor F to S	Silicone oil	0.07 kPa abs, 0.7 mbar abs, 0.5 mmHg and 21 MPa, 210 bar, 3045 psi <sup>(1)</sup> <sup>(2)</sup>
Sensor F to Q 266DSH High Static	Silicone oil	0.07 kPa abs, 0.7 mbar abs, 0.5 mmHg and 42 MPa, 420 bar, 6090 psi
Sensor E	Silicone oil	0.07 kPa abs, 0.7 mbar abs, 0.5 mmHg and 16 MPa, 160 bar, 2320 psi <sup>(1)</sup>
Sensor B	Silicone oil	0.07 kPa abs, 0.7 mbar abs, 0.5 mmHg and 7 MPa, 70 bar, 1015 psi <sup>(1)</sup>
Sensor A	Silicone oil	0.07 kPa abs, 0.7 mbar abs, 0.5 mmHg and 2 MPa, 20 bar, 290 psi <sup>(1)</sup>
Sensor F to S	Inert (Galden)	0.135 kPa abs, 1.35 mbar abs, 1 mmHg and 21 MPa, 210 bar, 3045 psi <sup>(1)</sup> <sup>(2)</sup>
Sensor E	Inert (Galden)	0.135 kPa abs, 1.35 mbar abs, 1 mmHg and 16 MPa, 160 bar, 2320 psi <sup>(1)</sup>
Sensor F to S	Inert (Halocarbon)	0.4 kPa abs, 4 mbar abs, 3 mmHg and 21 MPa, 210 bar, 3045 psi <sup>(1)</sup> <sup>(2)</sup>
Sensor F to Q 266DSH High Static	Inert (Halocarbon)	0.4 kPa abs, 4 mbar abs, 3 mmHg and 42 MPa, 420 bar, 6090 psi
Sensor E	Inert (Halocarbon)	0.4 kPa abs, 4 mbar abs, 3 mmHg and 16 MPa, 160 bar, 2320 psi <sup>(1)</sup>

(1) 1 MPa, 10 bar, 145 psi for Kynar-PVDF

(2) 16 MPa, 160 bar, 2320 psi for AISI 316 ss NACE bolting or for specific flange variant

### Static pressure limits

Transmitters for differential pressure model 266DSH operates within specifications between the following limits:

Sensors	Static pressure limits
Sensor F to S	1.3 kPa abs, 13 mbar abs, 0.2 psia and 21 MPa, 210 bar, 3045 psi <sup>(1)</sup> <sup>(2)</sup>
Sensor F to Q 266DSH High Static	1.3 kPa abs, 13 mbar abs, 0.2 psia and 42 MPa, 420 bar, 6090 psi
Sensor E	1.3 kPa abs, 13 mbar abs, 0.2 psia and 16 MPa, 160 bar, 2320 psi <sup>(1)</sup>
Sensor B	1.3 kPa abs, 13 mbar abs, 0.2 psia and 7 MPa, 70 bar, 1015 psi <sup>(1)</sup>
Sensor A	1.3 kPa abs, 13 mbar abs, 0.2 psia and 2 MPa, 20 bar, 290 psi <sup>(1)</sup>

(1) 1 MPa, 10 bar, 145 psi for Kynar-PVDF

(2) 16 MPa, 160 bar, 2320 psi for AISI 316 ss NACE bolting or for specific flange variant

### Proof pressure

The transmitter can be exposed without leaking to line pressure of up to

— 48 MPa, 480 bar, 6960 psi

— 77 MPa, 770 bar, 11165 psi for 266DSH high static version.

Meet ANSI/ISA-S 82.03 hydrostatic test requirements.

# Model 266DSH Differential

## Temperature limits °C ( °F ) :

### Ambient

is the operating temperature

Models 266DSH	Ambient temperature limits
Silicone oil for sensor F to S	-40 and 85 °C (-40 and 185 °F)
Silicone oil for sensor A to E	-25 and 85 °C (-13 and 185 °F)
Inert (Galden) for sensor F to S	-20 and 85 °C (-4 and 185 °F)
Inert (Galden) for sensor E	-10 and 85 °C (14 and 185 °F)
Inert (Halocarbon) for sensor F to S	-20 and 85 °C (-4 and 185 °F)
Inert (Halocarbon) for sensor E	-10 and 85 °C (14 and 185 °F)

Models 266DSH	Ambient temperature limits
LCD integral display	-40 and 85 °C (-40 and 185 °F)

LCD display may not be clearly readable below -20 °C (-4 °F) or above +70 °C (+158 °F)

Models 266DSH	Ambient temperature limit
Painted AISI 316 L ss housing	max 70 °C (158 °F) continuous

### IMPORTANT

For Hazardous Atmosphere applications see the temperature range specified on the certificate/approval relevant to the aimed type of protection

### Process

Models 266DSH	Process temperature limits
Silicone oil for sensor F to S	-40 and 121 °C (-40 and 250 °F) <sup>(1)</sup>
Silicone oil for sensor A to E	-25 and 121 °C (-13 and 250 °F) <sup>(1)</sup>
Inert (Galden) for sensor F to S	-20 and 100 °C (-4 and 212 °F) <sup>(2)</sup>
Inert (Galden) for sensor E	-10 and 100 °C (14 and 212 °F) <sup>(2)</sup>
Inert (Halocarbon) for sensor F to S	-20 and 100 °C (-4 and 212 °F) <sup>(2)</sup>
Inert (Halocarbon) for sensor E	-10 and 100 °C (14 and 212 °F) <sup>(2)</sup>

(1) 100 °C (212 °F) for application below atmospheric pressure

(2) 65 °C (150 °F) for application below atmospheric pressure

Models 266DSH	Process temperature limits
Viton gasket	-20 and 121 °C (-4 and 250 °F)

### Storage

Models 266DSH	Storage temperature limits
Storage limits	-50 and 85 °C (-58 and 185 °F)
LCD integral display	-40 and 85 °C (-40 and 185 °F)

## Environmental limits

### Electromagnetic compatibility (EMC)

Comply with EN 61326-1 and NAMUR NE 021 (2004) (option).  
Surge immunity level (with surge protector): 4 kV  
(according to IEC 1000-4-5 EN 61000-4-5)

### Pressure equipment directive (PED)

Comply with 97/23/EC

- Category III Module H for PS ≥ than 20 MPa, 200 bar
- Sound Engineering Practice (SEP) for PS < 20 MPa, 200 bar

### Humidity

Relative humidity: up to 100 %  
Condensing, icing: admissible

### Vibration resistance

Accelerations up to 2 g at frequency up to 1000 Hz  
(according to IEC 60068-2-6)

### Shock resistance

Acceleration: 50 g  
Duration: 11 ms  
(according to IEC 60068-2-27)

### Wet and dust-laden atmospheres

The transmitter is dust and sand tight and protected against immersion effects as defined by IEC 60529 (2001) to IP 67 (IP 68 on request) or by NEMA Type 4X. IP65 with Harting Han connector. Aluminium and AISI housings as barrel version also comply to IP 66 as defined by IEC 60529 (2001).

**Hazardous atmospheres  
(FOR ALL VERSIONS EXCEPT WirelessHART)**

With or without integral display

**INTRINSIC SAFETY:**

ATEX Europe (code E1) approval

II 1 G Ex ia IIC T6/T5/T4 and II 1/2 G Ex ia IIC T6/T5/T4 and

II 1 D Ex iaD 20 T85 °C and II 1/2 D Ex iaD 21 T85 °C; IP67.

IECEX (code E8) approval

Ex ia IIC T6/T5/T4 and Ex iaD 20 T85 °C and Ex iaD 21 T85 °C; IP67.

NEPSI China (code EY)

Ex ia IIC T4~T6, DIP A20TA, T4~T6.

**EXPLOSION PROOF:**

ATEX Europe (code E2) approval

II 1/2 G Ex d IIC T6 and II 1/2 D Ex tD A21 IP67 T85 °C (Ta = -50 to +75 °C).

IECEX (code E9) approval

Ex d IIC T6 and Ex tD A21 IP67 T85 °C (Ta = -50 to +75 °C).

NEPSI China (code EZ)

Ex d IIC T6, DIP A21TA, T6.

**TYPE "N":**

ATEX Europe (code E3 ) type examination

II 3 G Ex nL IIC T6/T5/T4 and II 3 D Ex tD A22 IP67 T85 °C; IP67.

IECEX (code ER) type examination

Ex nL IIC T6/T5/T4; IP67.

NEPSI China (code ES) type examination

Ex nL IIC T4~T6, DIP A22TA, T6.

FM Approvals US (code E6) and FM Approvals Canada (code E4):

- Explosionproof (US): Class I, Div. 1, Groups A, B, C, D
- Explosionproof (Canada): Class I, Div. 1, Groups B, C, D
- Dust ignitionproof : Class II, Div. 1, Groups E, F, G
- Suitable for: Class II, Div. 2, Groups F, G; Class III, Div.1, 2
- Nonincendive: Class I, Div. 2, Groups A, B, C, D
- Intrinsically safe: Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G
  - Class I, Zone 0 AEx ia IIC T6/T4, Zone 0 (FM US)
  - Class I, Zone 0 Ex ia IIC T6/T4, Zone 0 (FM Canada)

COMBINED ATEX (code EW = E1 + E2 + E3), (code E7 = E1 + E2)

COMBINED ATEX, FM and IECEX Approvals (code EN = EW + E4 + E6+ E1)

COMBINED FM Approvals US and Canada

- Intrinsically safe (code EA)
- Explosionproof (code EB)
- Nonincendive (code EC)

COMBINED IECEX (code EH = E8 + E9), (code EI = E8 + E9 + ER)

COMBINED NEPSI (code EP = EY + EZ), (code EQ = EY + EZ + ES)

Technical Regulations Customs Union EAC (Russia, Kazakhstan, Belarus),  
Inmetro (Brazil), Kosha (Korea).

REFER TO CERTIFICATES FOR AMBIENT TEMPERATURE  
RANGES (WITHIN THE LIMITS OF -50 TO 85°C) RELATED TO  
THE DIFFERENT TEMPERATURE CLASSES

**Hazardous atmospheres  
(ONLY FOR WirelessHART VERSION)**

With or without integral display

**INTRINSIC SAFETY:**

ATEX Europe (code E1) approval

II 1 G Ex ia IIC T4 and II 1/2 G Ex ia IIC T4.

IECEX (code E8) approval

Ex ia IIC T4.

FM Approvals US and FM Approvals Canada:

- Intrinsically safe: Class I, Div. 1, Groups A, B, C, D (code EA)
  - Class I, Zone 0 AEx ia IIC T4 (FM US)
  - Class I, Zone 0 Ex ia IIC T4 (FM Canada)

COMBINED ATEX, IECEX and FM Approvals US and Canada

(Code EF = E1 + E8 + EA)

REFER TO CERTIFICATES FOR AMBIENT TEMPERATURE  
RANGES (WITHIN THE LIMITS OF -50 TO 70°C) RELATED TO  
THE DIFFERENT TEMPERATURE CLASSES

# Model 266DSH Differential

## Electrical Characteristics and Options

### Optional indicators

#### Standard integral display

(code L9; only with HART standard functionality)

Wide screen LCD, 128 x 64 pixel, 52.5 x 27.2 mm (2.06 x 1.07 in.) dot matrix. Multilanguage. Without keypad.

User selectable application-specific visualizations.

Totalized and instantaneous flow indication. Display may also indicate static pressure, sensor temperature and diagnostic messages and provides configuration facilities.



#### Integral display with integral keypad

(code L1; not with HART standard functionality)

Wide screen LCD, 128 x 64 pixel, 52.5 x 27.2 mm (2.06 x 1.07 in.) dot matrix. Multilanguage. Four keys for configuration and management of device.

Easy setup for quick commissioning. User selectable application-specific visualizations.

Totalized and instantaneous flow indication. Display may also indicate static pressure, sensor temperature and diagnostic messages and provides configuration facilities.



#### Integral display with Through-The-Glass (TTG) activated keypad (code L5; not with HART standard functionality)

As above integral display but equipped with the innovative TTG keypad allowing the activation of the configuration and management menus of the device without the need of removing the transmitter housing cover. TTG keypad is protected against accidental activations.



### Optional surge protection

Up to 4kV

- voltage 1.2  $\mu$ s rise time / 50  $\mu$ s delay time to half value
- current 8  $\mu$ s rise time / 20  $\mu$ s delay time to half value

### Process diagnostics (PILD)

Plugged impulse line detection (PILD) generates a warning via communication (HART, PA, FF). The device can be configured to drive the output to “Alarm current” or set a status “BAD”.

### HART® digital communication and 4 to 20 mA output Standard and Advanced functionality

Device type: 1a07<sub>hex</sub> (listed with HCF)

### Power supply

The transmitter operates from 10.5 to 42 V DC with no load and is protected against reverse polarity connection (additional load allows operations over 42 V DC).

For Ex ia and other intrinsically safe approval power supply must not exceed 30 V DC. Minimum operating voltage increase to 12.3 V DC with optional surge protector

### Ripple

20 mV max on a 250  $\Omega$  load as per HART specifications.

### Load limitations

4 to 20 mA and HART total loop resistance :

$$R \text{ (k}\Omega\text{)} = \frac{\text{Supply voltage} - \text{min. operating voltage (V DC)}}{22 \text{ mA}}$$

A minimum of 250  $\Omega$  is required for HART communication.

### Output signal

Two-wire 4 to 20 mA, user-selectable for linear or square root output, power of  $3/2$  or  $5/2$ , square root for bidirectional flow, 22 points linearization table (i.e. for horizontal or spherical tank level measurement). HART® communication provides digital process variable superimposed on 4 to 20 mA signal, with protocol based on Bell 202 FSK standard.

HART revision 5 is the default HART output.

HART revision 7 is available on request.

### Output current limits (to NAMUR NE 43 standard)

Overload condition

- Lower limit: 3.8 mA (configurable from 3.8 to 4 mA)
- Upper limit: 20.5 mA (configurable from 20 to 21 mA)

Alarm current

- Lower limit: 3.6 mA (configurable from 3.6 to 4 mA)
- Upper limit: 21 mA (configurable from 20 to 23 mA, limited to 22 mA for HART Safety; apply for electronics release 7.1.15 or later)

Factory setting: high alarm current

### IEC 62591 WirelessHART® output

Device type: 1a06<sub>hex</sub> (listed with HCF)  
Network ID: ABB<sub>hex</sub> (2747 decimal)  
Join keys: 57495245<sub>hex</sub> (1464422981) 4c455353<sub>hex</sub> (1279611731)  
4649454c<sub>hex</sub> (1179206988) 444b4559<sub>hex</sub> (1145783641).

### Power Supply

1x D-cell size lithium-thionyl chloride battery.  
Battery life: 10 years at 32 sec. update time, 8 years at 16 sec. update time or 5 years at 8 sec. update time.  
(at reference conditions of 25 ± 2 °C ambient temperature, data routed from 3 additional devices, LCD off).  
THE BATTERY CAN BE REPLACED IN FIELD, ALSO IN HAZARDOUS CLASSIFIED AREA.

### Output signal

IEC 62591 WirelessHART Version 7.5 (IEEE 802.15.4-2006);  
Frequency band: 2.4 GHz DSSS  
Update rate: user selectable from 1 sec. to 60 min.

### Integrated adjustable omnidirectional antenna

— Output radio frequency: maximum 10 mW (10 dBm) EIRP  
— Range: up to 300 m. (328 yds.)  
Minimum distance between antenna and person is 0.2 m. (8 in.)

### Telecommunications directive

Every wireless measuring device must be certified in accordance with the telecommunications directive, in this case the frequency range. This certification is country-specific.

### European directives

Radio Equipment and Telecommunications Terminal Equipment Directive 99/5/EC R&TTE  
ETSI EN 300 328 V1.7.1 in accordance with Article 3.2  
ETSI EN 301 489-17  
In Europe, use of the 2400 - 2483.5 MHz frequency band is not harmonized. Country-specific regulations must be observed.

### Restrictions for Norway

Operation not permitted within a radius of 20 km around Ny-Alesund in Svalbard. For more information, see [www.npt.no](http://www.npt.no) Norway Posts and Telecommunications site

### USA / Canadian directives

FCC Part 15.247:2009 (USA)  
IC RSS-210 and ICES-003 (Canada)

### PROFIBUS® PA output

#### Device type

Pressure transmitter compliant to Profiles 3.0.1  
Identification number: 3450 (hex)

#### Power supply

The transmitter operates from 9 to 32 V DC , polarity independent, with or without surge protector.  
For Ex ia approval power supply must not exceed 17.5 V DC.  
Intrinsic safety installation according to FISCO model.

#### Current consumption

operating (quiescent): 15 mA  
fault current limiting: 20 mA max.

#### Output signal

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

#### Output interface

PROFIBUS PA communication according to Profibus DP50170 Part 2/DIN 19245 part 1-3.

#### Output update time

25 ms

#### Data blocks

3 analog input, 1 physical.

#### Additional blocks

1 Pressure with calibration transducer block  
1 Advanced Diagnostics transducer block including Plugged Input Line Detection  
1 Local Display transducer block

#### Transmitter failure mode

On gross transmitter failure condition, detected by self-diagnostics, the output signal can be driven to defined conditions, selectable by the user as safe, last valid or calculated value.  
If electronic failure or short circuit occur the transmitter consumption is electronically limited at a defined value (20 mA approx), for safety of the network.

# Model 266DSH Differential

## FOUNDATION Fieldbus™ output

### Device type

LINK MASTER DEVICE

Link Active Scheduler (LAS) capability implemented.

Manufacturer code: 000320<sub>hex</sub>

Device type code: 0007<sub>hex</sub>

### Power supply

The transmitter operates from 9 to 32 V DC, polarity independent, with or without surge protector.

For Ex ia approval power supply must not exceed 24 V DC (entity certification) or 17.5 V DC (FISCO certification), according to FF-816.

### Current consumption

operating (quiescent): 15 mA

fault current limiting: 20 mA max.

### Output signal

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

### Function blocks/execution period

3 enhanced Analog Input blocks/25 ms max (each)

1 enhanced PID block/40 ms max.

1 standard ARithmetic block/25 ms

1 standard Input Selector block/25 ms

1 standard Control Selector block/25 ms

1 standard Signal Characterization block/25 ms

1 standard Integrator/Totalizer block/25 ms

### Additional blocks

1 enhanced Resource block,

1 custom Pressure with calibration transducer block

1 custom Advanced Diagnostics transducer block including Plugged Input Line Detection

1 custom Local Display transducer block

### Number of link objects

35

### Number of VCRs

35

## Output interface

FOUNDATION fieldbus digital communication protocol to standard H1, compliant to specification V. 1.7.

## Transmitter failure mode

The output signal is “frozen” to the last valid value on gross transmitter failure condition, detected by self-diagnostics which also indicate a BAD conditions. If electronic failure or short circuit occur the transmitter consumption is electronically limited at a defined value (20 mA approx), for safety of the network.



## Performance specifications

Stated at reference condition to IEC 60770 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 AISI 316 L ss or Hastelloy and silicone oil fill and HART digital trim values equal to 4 mA and to 20 mA span end points, in linear mode. Unless otherwise specified, errors are quoted as % of span. Some performance referring to the Upper Range Limit are affected by the actual turndown (TD) as ratio between Upper Range Limit (URL) and calibrated span.

IT IS RECOMMENDED TO SELECT THE TRANSMITTER SENSOR CODE PROVIDING THE TURNDOWN VALUE AS LOWEST AS POSSIBLE TO OPTIMIZE PERFORMANCE CHARACTERISTICS.

### Dynamic performance (according to IEC 61298-1 definition)

Sensors	Time constant (63.2 % of total step change)
Sensor M to S	≤ 70 ms
Sensor H	100 ms
Sensor F	180 ms
Dead time for all sensors	30 ms

Response time (total) = dead time + time constant

See "Update rate" for WirelessHART version.

### Accuracy rating

% of calibrated span, including combined effects of terminal based linearity, hysteresis and repeatability. For fieldbus versions SPAN refer to analog input function block outscale range

Model	Sensor	for TD	
266DSH standard static and for gauge application	F to P	from 1:1 to 10:1	± 0.06 %
	F to P	from 10:1 to 100:1	± (0.006 x TD) %
	E, Q, S	from 1:1 to 10:1	± 0.075 %
	Q and S	from 10:1 to 100:1	± (0.0075 x TD) %
	E	from 10:1 to 30:1	± (0.0075 x TD) %
	B	from 1:1 to 10:1	± 0.10 %
	B	from 10:1 to 20:1	± (0.01 x TD) %
	A	from 1:1 to 4:1	± 0.10 %
266DSH (option D2)	F to Q	from 1:1 to 5:1	± 0.04 %
	F to P	from 5:1 to 100:1	± (0.0105 + 0.0059 x TD) %
	Q	from 5:1 to 100:1	± (0.003 + 0.0074 x TD) %
266DSH high static	F to Q	from 1:1 to 10:1	± 0.075 %
	F to Q	from 10:1 to 100:1	± (0.0075 x TD) %

### Ambient temperature

per 20K change between the limits of -40 °C to +85 °C (per 36 °F change between the limits of -40 to +185 °F):

Model	Sensor	for TD up to	
266DSH	F to Q	10:1	± (0.03 % URL + 0.045 % span)
	E and S	10:1	± (0.04 % URL + 0.065 % span)
	B	10:1	± (0.06 % URL + 0.10 % span)
	A	4:1	± (0.10 % URL + 0.10 % span)

for an ambient temperature change from -10 °C to +60 °C (+14 to +140 °F):

Model	Sensor	for TD up to	
266DSH	F to Q	10:1	± (0.055 % URL + 0.08 % span)
	E and S	10:1	± (0.075 % URL + 0.11 % span)
	B	10:1	± (0.11 % URL + 0.18 % span)
	A	4:1	± (0.18 % URL + 0.18 % span)

per 10K change between the limits of -40 °C to -10 °C or +60° to +85 °C (per 18 °F change between the limits of -40 to +14 °F or +140° to +185 °F):

Model	Sensor	for TD up to	
266DSH	F to Q	10:1	± (0.03 % URL + 0.04 % span)
	E and S	10:1	± (0.04 % URL + 0.055 % span)
	B	10:1	± (0.055 % URL + 0.09 % span)
	A	4:1	± (0.09 % URL + 0.09 % span)

### Static pressure

(zero errors can be calibrated out at line pressure)

per 0.5 MPa, 5 bar or 72.5 psi (sensor A)

per 2 MPa, 20 bar or 290 psi (sensor B)

per 3.5 MPa, 35 bar or 500 psi (sensor E)

per 7 MPa, 70 bar or 1015 psi (sensor F to S)

Model 266DSH standard static

— zero error: ±0.05 % of URL for sensor F to S

±0.08 % of URL for sensor A, B and E

— span error: ±0.08 % of reading.

Model 266DSH high static

— zero error: ±0.08 % of URL for sensor F to Q

— span error: ±0.20 % of reading.

# Model 266DSH Differential

## Supply voltage

Within voltage/load specified limits the total effect is less than 0.005 % of URL per volt.

## Load

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

## Electromagnetic field

Meets all the requirements of EN 61326 for surge immunity level (of NAMUR NE 21 on request).

## Common mode interference

No effect from 100Vrms @ 50Hz, or 50 V DC

## Mounting position

No effect for rotation on diaphragm plane. A tilt up to 90° from vertical causes a zero shifts up to 0.5 kPa, 5 mbar or 2 inH2O, which can be corrected with zero adjustment. No span effect.

## Stability

±0.15 % of URL over a ten years period  
 (±0.25 % of URL over a ten years period for sensor A and B)  
 0.15 % of URL over a five years period for 266DSH high static.

## Maximum total performance

For temperature change of 28 °C (50 °F), static pressure change of 5,1 MPa, 51 bar, 740 psi, for model 266DSH with accuracy option code D2 (± 0.04 %)

Sensor	Span	Maximum total performance
F	35 kPa, 350 mbar, 140 inH2O	≤± 0.125 % of calibrated span
H	150 kPa, 1,5 bar, 600 inH2O	
M	550 kPa, 5,5 bar, 80 psi	

$$E_{\text{Mperf}} = \sqrt{(E_{\Delta Tz} + E_{\Delta Ts})^2 + E_{\Delta Ps}^2 + E_{\text{lin}}^2}$$

$E_{\text{Mperf}}$  = Maximum total performance

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

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

$E_{\Delta Ps}$  = Effect of the static pressure on span

$E_{\text{lin}}$  = Accuracy rating (for terminal-based linearity 0.04 %)

## Total performance

similar to DIN 16086

Temperature change in the range from -10 to 60 °C (14 to 140 °F), static pressure change (266DSH) 10 MPa, 100 bar, 1450 psi

Model	Sensor	TD	Total performance
266DSH std. static, D2 option	F to Q	1:1	≤± 0.16 % of calibrated span

$$E_{\text{perf}} = \sqrt{(E_{\Delta Tz} + E_{\Delta Ts})^2 + E_{\Delta Ps}^2 + E_{\text{lin}}^2}$$

$E_{\text{perf}}$  = Total Performance

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

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

$E_{\Delta Ps}$  = Effect of the static pressure on span (266DSH only)

$E_{\text{lin}}$  = Accuracy rating (for terminal-based linearity 0.04 % or 0.075% as per model/sensor accuracy)

Maximum total performance and Total performance includes the measuring errors of

- non-linearity including hysteresis and non-reproducibility,
- thermal change of the ambient temperature as regards the zero signal and the calibrated span,
- effect of static pressure change on the calibrated span, with transmitter re-zeroed at line pressure

## Physical Specification

(Refer to ordering information sheets for variant availability related to specific model or versions code)

### Materials

#### Process isolating diaphragms (\*)

AISI 316 L ss; AISI 316 L ss gold plated; Monel 400®; Tantalum; Hastelloy® C-276; Hastelloy® C-276 on AISI 316L ss gasket seat.

#### Process flanges, adapters, plugs and drain/vent valves (\*)

AISI 316 L ss <sup>(1)</sup>; Hastelloy® C-276 <sup>(2)</sup>; Monel 400® <sup>(3)</sup>; Kynar® (PVDF insert in AISI 316 ss flange).

#### Sensor fill fluid

Silicone oil; Inert fill (Halocarbon® 4.2 or Galden®).

#### Mounting bracket (\*\*)

Zinc plated carbon steel with chrome passivation; AISI 316 ss; AISI 316 L ss.

#### Gaskets (\*)

Viton®; PTFE.

#### Sensor housing

AISI 316 L ss.

#### Bolts and nuts

AISI 316 ss bolts Class A4–80 and nuts Class A4–70 per UNI 7323 (ISO 3506);

AISI 316 ss bolts and nuts Class A4–50 per UNI 7323 (ISO 3506), in compliance with NACE MR0175 Class II (std. static only).

Plated alloy steel bolts per ASTM-A-193-77a grade B7M and nuts per ASTM A194/A 194 M-90 grade 2HM, in compliance with NACE MR0175 Class II.

Stainless steel per ASTM-A-453 grade 660D, in compliance with NACE MR0175 Class II (high static only).

### Electronic housing and covers

Aluminium alloy (copper content  $\leq 0.3$  %) with baked epoxy finish (colour RAL9002); AISI 316 L ss; AISI 316 L ss with two components epoxy mastic coated with acrylic epoxy finish (colour aluminium grey), with antistatic agents according to CEI EN 60079.

### Covers O-ring

Buna N.

### Local adjustments (zero, span and write protect)

For Standard HART version:

- Internal for zero and span (on communication board)
- External non-intrusive for zero, span and write protect in glass filled polyphenylene oxyde, removable (code R1).

For all other versions:

- External non-intrusive for zero, span and write protect in glass filled polyphenylene oxyde, removable.

### Plates

Transmitter nameplate: AISI 316 ss screwed to the electronics housing.

Certification plate and optional tag/calibration plate : self-adhesive attached to the electronics housing or AISI 316 ss fastened to the electronics housing with rivets or screws.

Optional wired-on customer data plate: AISI 316 ss.

Laser printing on metal or thermal printing on self-adhesive.

For AISI 316 L ss housing it is mandatory to select option I2 or I3 for plates in AISI 316 ss.

### Calibration

Standard: at maximum span, zero based range, ambient temperature and pressure;

Optional: at specified range and ambient conditions.

(\*)Wetted parts of the transmitter.

(\*\*) U-bolt material: high-strength alloy steel or AISI 316 L ss; bolts/nuts material: high-strength alloy steel or AISI 316 ss.

<sup>(1)</sup> Supplied as AISI 316 L or as ASTM A351 Grade CF-3M

<sup>(2)</sup> Supplied as Hastelloy C-276 or as ASTM A494 alloy CW-12MW

<sup>(3)</sup> Supplied as Monel 400 or as ASTM A494 Grade M-35-1

# Model 266DSH Differential

## Optional extras

### Mounting brackets (code Bx)

For vertical and horizontal 60mm. (2in) pipes or wall mounting. (EXCEPT U-BOLT ASSEMBLY WHICH IS NOT SUPPLIED FOR WALL MOUNTING, PARTS ARE THE SAME FOR PIPE AND WALL BRACKET OPTIONS, AS PER RELEVANT MATERIALS).

### Display (code Lx)

4-position (at 90°) user orientable.

### Optional plates (code Ix)

Code I2: AISI 316 ss plate with laser printed tag (up to 31 characters) and calibration details (up to 31 characters: lower and upper range values and engineering unit) fixed onto transmitter housing.

Code I1: AISI 316 ss wired-on plate with laser printed customized data (4 lines of 32 characters with 4 mm/0.16 in. height).

### Surge protection (code S2)

### Cleaning procedure for oxygen service (code P1)

### Test Certificates (test, design, calibration, material traceability) (codes Cx and Hx)

### Tag and manual language (codes Tx and Mx)

### Communication connectors (code Ux)

### Manifold mounting (code A1)

Factory mounting and pressure test of ABB M26 manifolds.

### Process connections

on flanges :  $\frac{1}{4}$  in. – 18 NPT on process axis  
on adapters :  $\frac{1}{2}$  in. – 14 NPT on process axis  
centre distance (266DSH): 54 mm. (2.13 in.) on flange;  
51, 54 or 57 mm. (2.01, 2.13 or 2.24 in.) as per adapters fittings  
fixing threads:  $\frac{7}{16}$  in. – 20 UNF at 41.3 mm centre distance

### Electrical connections

Two  $\frac{1}{2}$  in. – 14 NPT or M20x1.5 threaded conduit entries, direct on housing. Only M20x1.5 for WirelessHART with one port used for antenna.

Special communication connector (on request)

- HART: straight or angle Harting Han 8D connector and one plug.
- FOUNDATION Fieldbus, PROFIBUS PA: M12x1 or 7/8 in.

### Terminal block

HART version: three terminals for signal/external meter wiring up to 2.5 mm<sup>2</sup> (14 AWG), also connection points for test and communication purposes.

WirelessHART version: connection points for test and communication purposes; additional fast connection for external harvesting unit.

Fieldbus versions: two terminals for signal wiring (bus connection) up to 2.5 mm<sup>2</sup> (14 AWG)

### Grounding

Internal and external 6 mm<sup>2</sup> (10 AWG) ground termination points are provided.

### Mounting position

Transmitter can be mounted in any position.

Electronics housing may be rotated to any position. A positive stop prevents over travel.

### Mass (without options)

4 kg approx (8.8 lb);

4.35 kg approx (9.6 lb) for 266DSH high static version;  
add 1.5 kg (3.3 lb) for AISI housing.

Add 650 g (1.5 lb) for packing.

### Packing

Carton 27 x 24 x 20 cm approx (11 x 10 x 8 in.);

Carton 28 x 28 x 24 cm approx (11 x 11 x 10 in.) for WirelessHART version.

## Configuration

### Transmitter with HART communication and 4 to 20 mA Standard configuration

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and configured as follows:

Engineering Unit	kPa
4 mA	Zero
20 mA	Upper Range Limit (URL)
Output	Linear
Damping	1 s
Transmitter failure mode	Upscale
Software tag (8 characters max)	Blank
Optional LCD display	PV in kPa; output in mA and in percentage on bargraph

Any or all the above configurable parameters, including Lower range-value and Upper range-value which must be the same unit of measure, can be easily changed using the HART hand-held communicator or by a PC running the configuration software with DTM for 266 models. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

### Custom configuration (option N6)

The following data may be specified in addition to the standard configuration parameters:

Descriptor	16 alphanumeric characters
Message	32 alphanumeric characters
Date	Day, month, year

For HART protocol available engineering units of pressure measure are :

Pa, kPa, MPa

inH<sub>2</sub>O@4 °C, mmH<sub>2</sub>O@4 °C, psi

inH<sub>2</sub>O@20 °C, ftH<sub>2</sub>O@20 °C, mmH<sub>2</sub>O@20 °C

inHg, mmHg, Torr

g/cm<sup>2</sup>, kg/cm<sup>2</sup>, atm

mbar, bar

These and others are available for PROFIBUS and FOUNDATION Fieldbus.

### Transmitter with WirelessHART communication Standard configuration

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and configured as follows:

Engineering Unit	kPa
Output scale 0 %	Lower Range Limit (LRL)
Output scale 100 %	Upper Range Limit (URL)
Output	Linear
Update time	16 s
Software tag (8 characters max)	Blank
Optional LCD display	PV in kPa; output in percentage on bargraph

Any or all the above configurable parameters, including Lower range-value and Upper range-value which must be the same unit of measure, can be easily changed using the HART hand-held communicator or by a PC running the configuration software with DTM for 266 models. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

### Custom configuration (option N6)

The following data may be specified in addition to the standard configuration parameters:

Descriptor	16 alphanumeric characters
Message	32 alphanumeric characters
Date	Day, month, year

# Model 266DSH Differential

## Transmitter with PROFIBUS PA communication

### Standard configuration

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and configured as follows:

Measure Profile	Pressure
Engineering Unit	kPa
Output scale 0 %	Lower Range Limit (LRL)
Output scale 100 %	Upper Range Limit (URL)
Output	Linear
Hi-Hi Limit	Upper Range Limit (URL)
Hi Limit	Upper Range Limit (URL)
Low Limit	Lower Range Limit (LRL)
Low-Low Limit	Lower Range Limit (LRL)
Limits hysteresis	0.5 % of output scale
PV filter	0 s
Address (set by local key)	126
Tag	32 alphanumeric characters
Optional LCD display	PV in kPa; output in percentage on bargraph

Any or all the above configurable parameters, including the range values which must be the same unit of measure, can be easily changed by a PC running the configuration software with DTM for 266 models. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

### Custom configuration (option N6)

The following data may be specified in addition to the standard configuration parameters:

Descriptor	32 alphanumeric characters
Message	32 alphanumeric characters
Date	Day, month, year

## Transmitter with FOUNDATION Fieldbus communication

### Standard configuration

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and the analog input function block FB1 is configured as follows:

Measure Profile	Pressure
Engineering Unit	kPa
Output scale 0 %	Lower Range Limit (LRL)
Output scale 100 %	Upper Range Limit (URL)
Output	Linear
Hi-Hi Limit	Upper Range Limit (URL)
Hi Limit :	Upper Range Limit (URL)
Low Limit	Lower Range Limit (LRL)
Low-Low Limit	Lower Range Limit (LRL)
Limits hysteresis	0.5 % of output scale
PV filter time	0 s
Tag	32 alphanumeric characters
Optional LCD display	PV in kPa; output in percentage on bargraph

The analog input function block FB2 and FB3 are configured respectively for the sensor temperature measured in °C and for the static pressure measured in MPa.

Any or all the above configurable parameters, including the range values, can be changed using any host compliant to FOUNDATION fieldbus. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

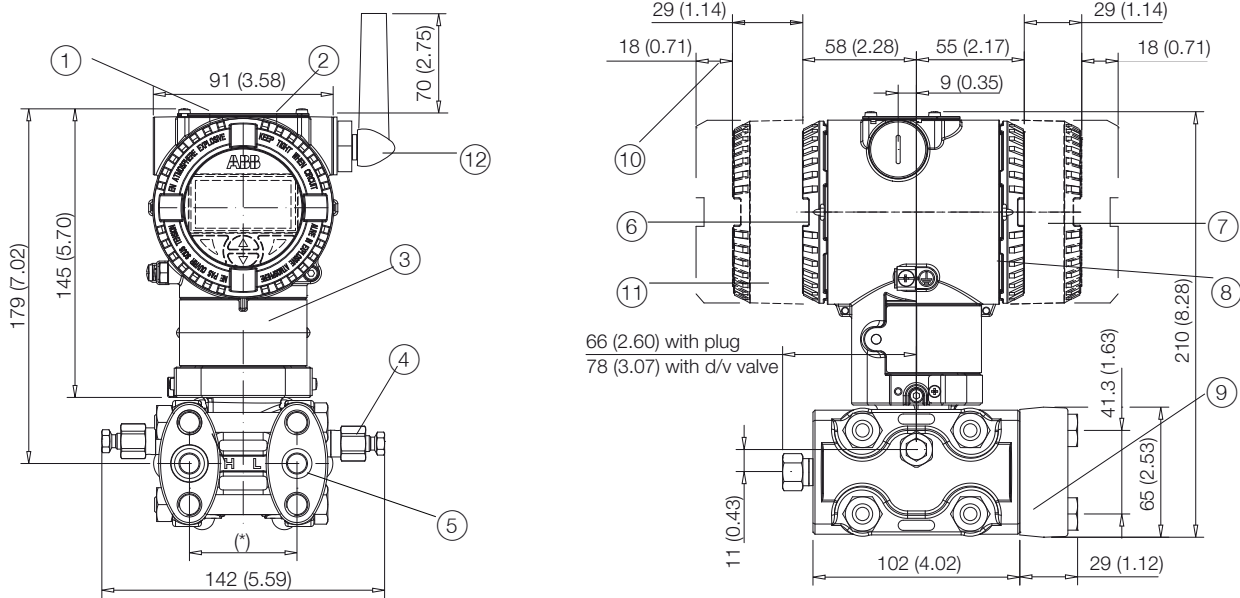
### Custom configuration (option N6)

The following data may be specified in addition to the standard configuration parameters:

Descriptor	32 alphanumeric characters
Message	32 alphanumeric characters
Date	Day, month, year

## Mounting dimensions (not for construction unless certified) – dimensions in mm. (in.)

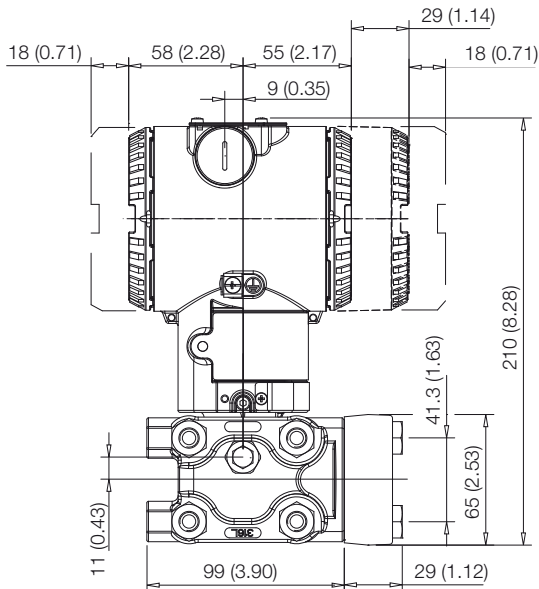
### Standard static transmitter with barrel housing - horizontal flanges



(\*) FOR MODEL 266DSH: 54 (2.13) mm (in) on 1/4 – 18 NPT process flange; 51 (2.01), 54 (2.13) or 57 (2.24) mm (in) according to 1/2 – 14 NPT adapters fitting

- ① Adjustments | ② Identification plate | ③ Certification plate | ④ Drain/vent valve | ⑤ Process connection | ⑥ Terminal side |
- ⑦ Integral display housing | ⑧ Electronic side | ⑨ Adapter | ⑩ Space for cover removal | ⑪ Battery housing of WirelessHART version |
- ⑫ Antenna of WirelessHART version

### Standard static transmitter with barrel housing - horizontal flanges with MWP= 16 MPa



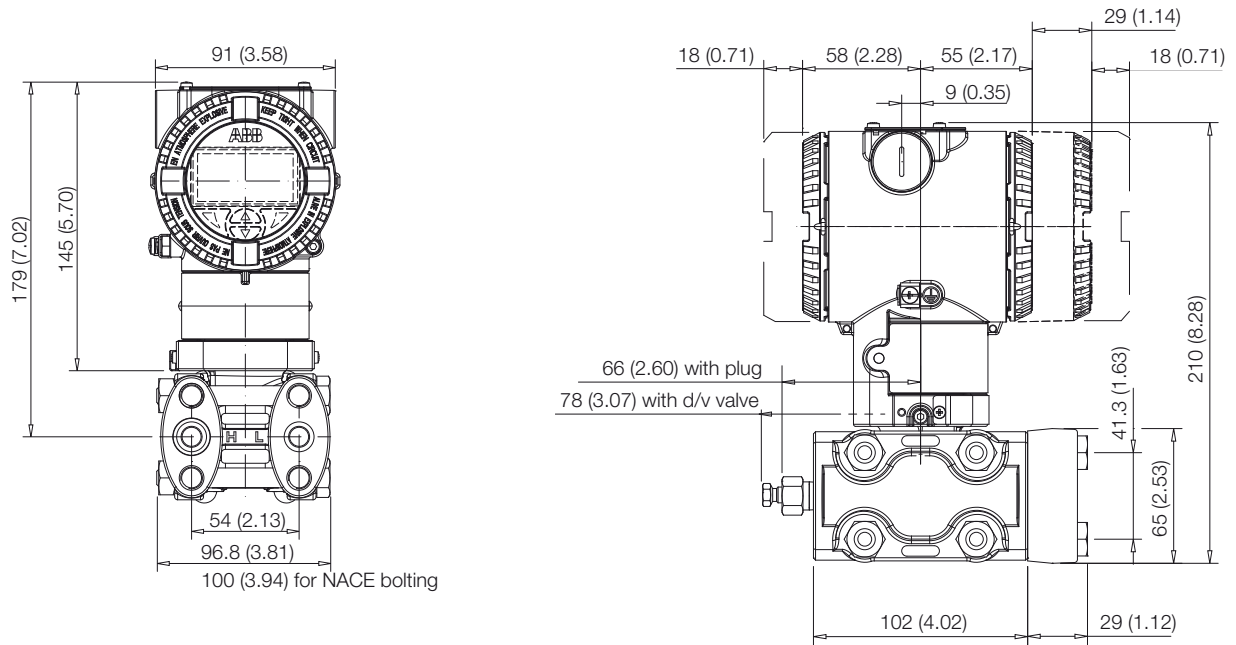
#### NOTE

Process connection, gasket groove and gaskets are in accordance with IEC 61518.

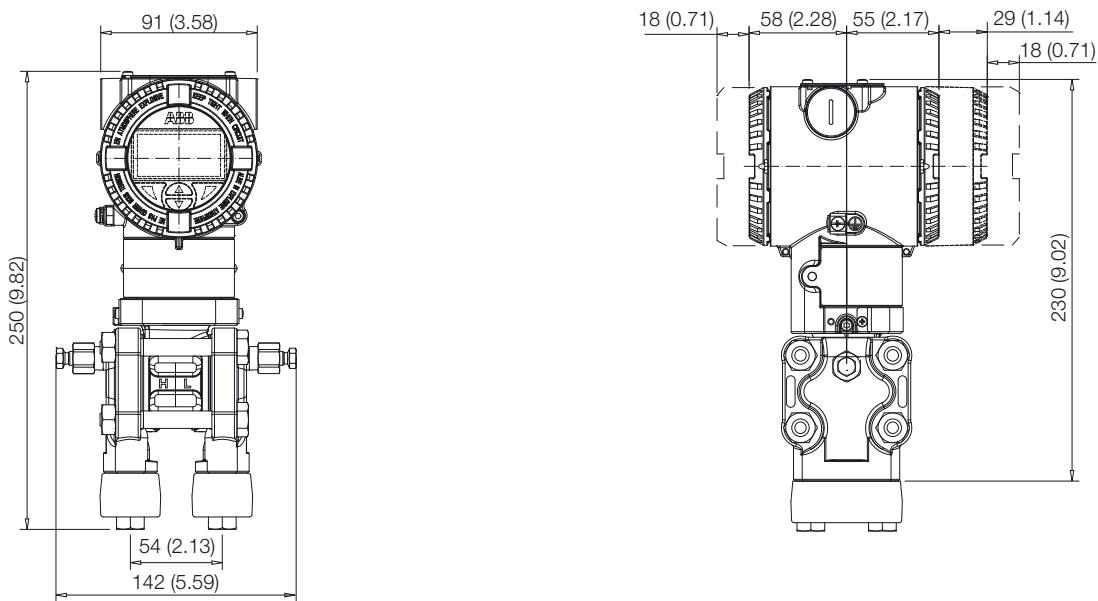
Bolting threads for fixing adapter or other devices (i.e. manifold etc.) on process flange is  $\frac{7}{16}$  – 20 UNF.

# Model 266DSH Differential

## High static transmitter with barrel housing - horizontal flanges

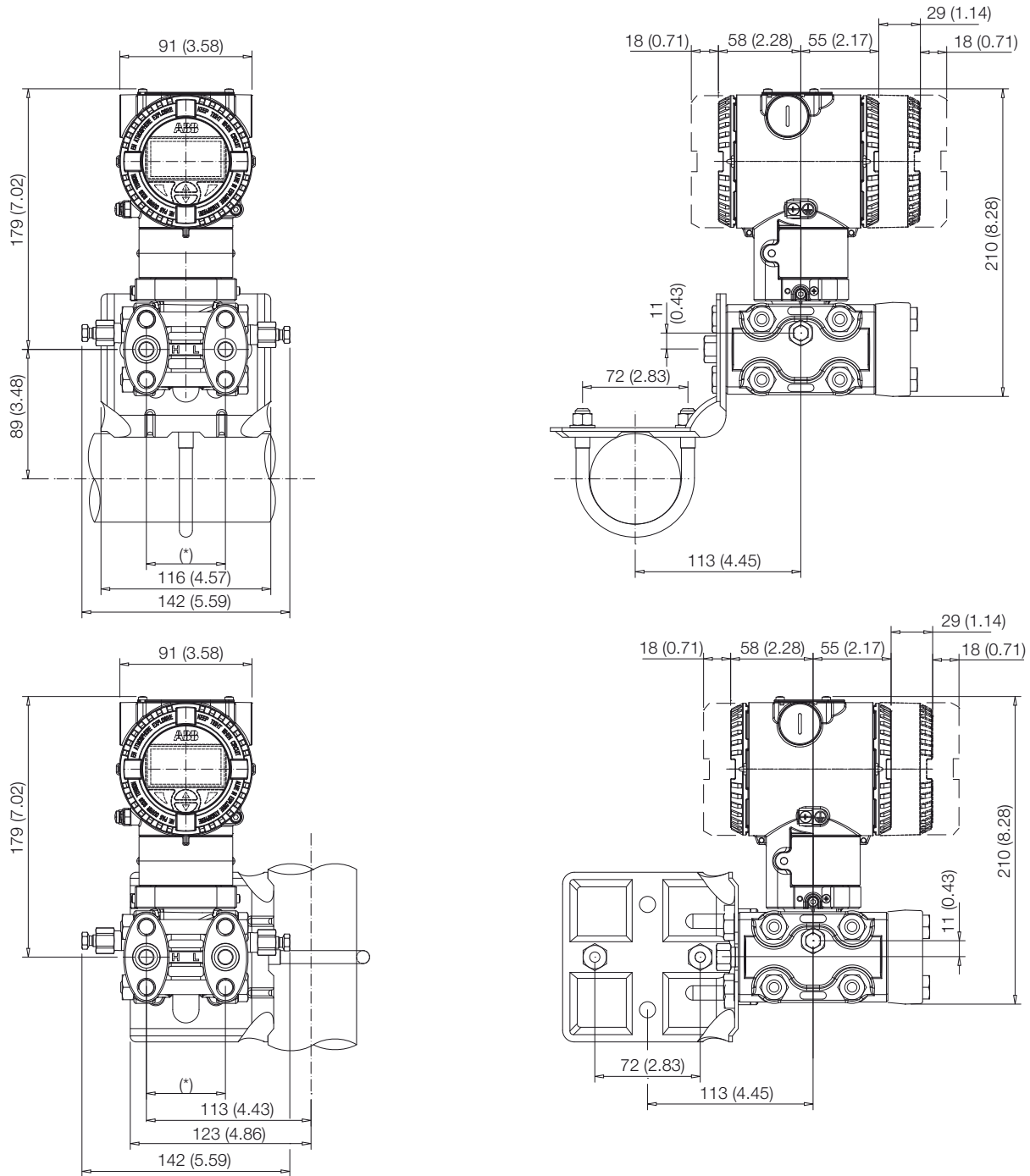


## Standard static transmitter with barrel housing - vertical flanges



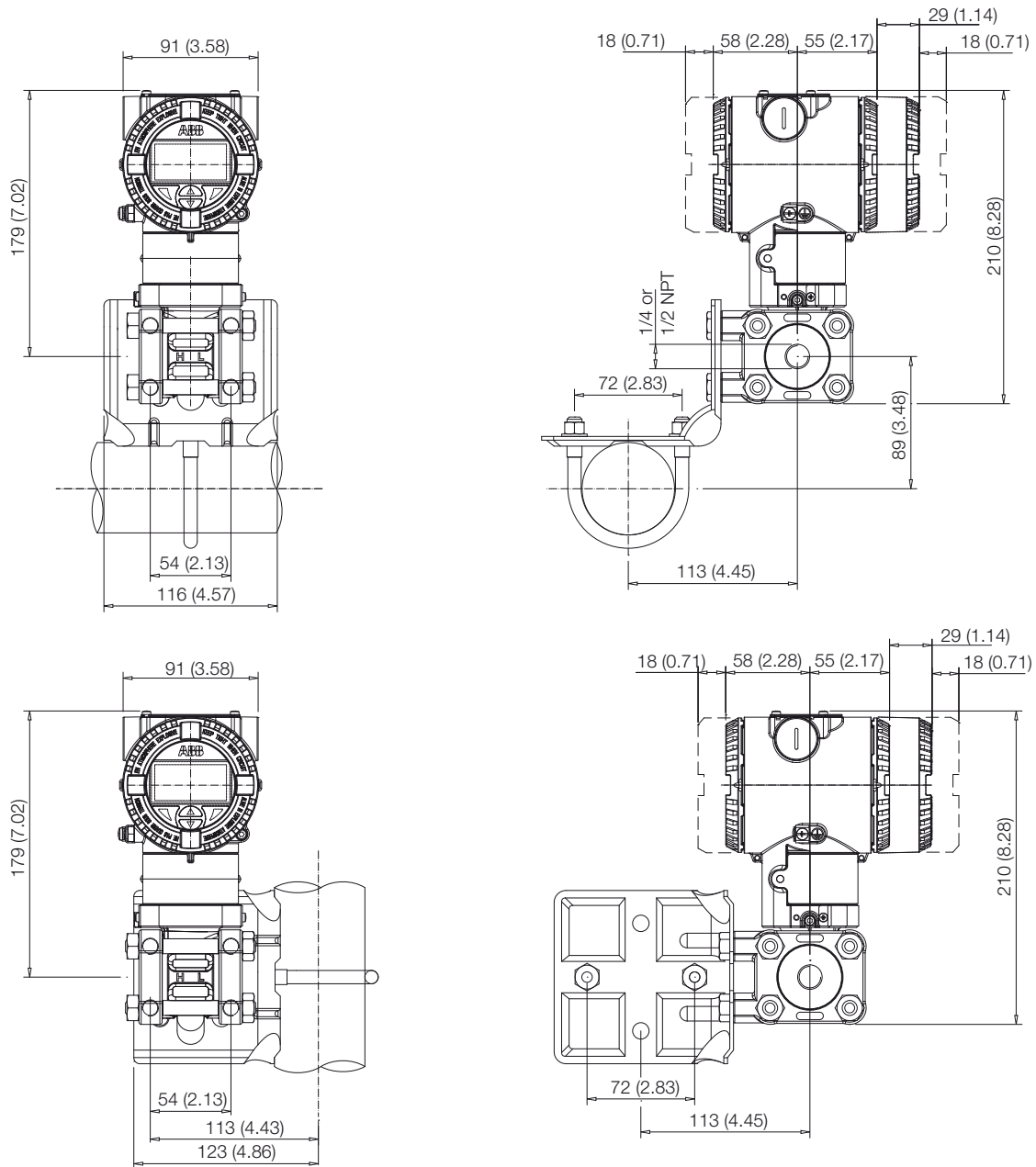


Transmitter on bracket for vertical or horizontal 60 mm. (2 in.) pipe mounting

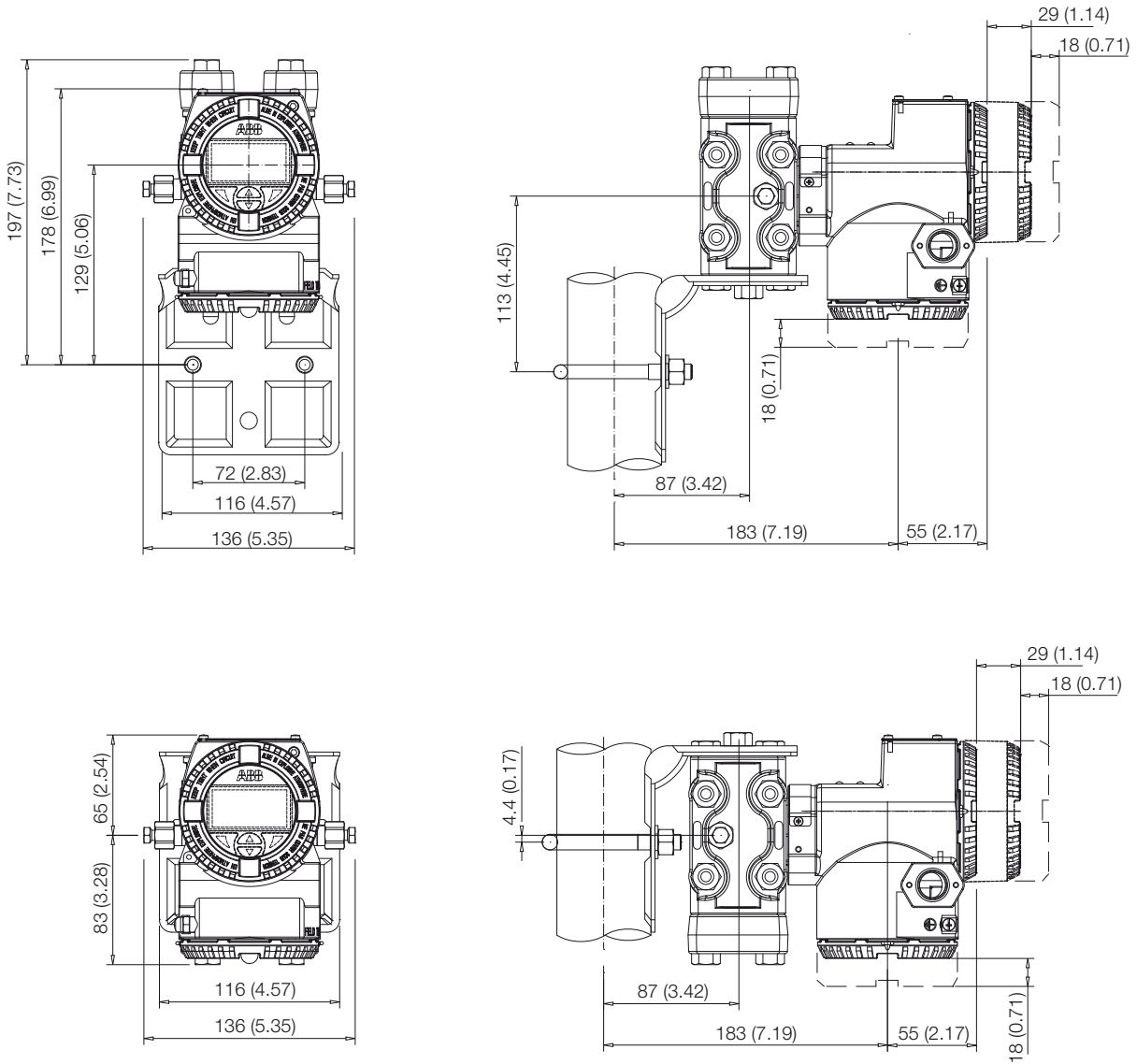


# Model 266DSH Differential

Transmitter with Kynar flanges on bracket for vertical or horizontal 60 mm. (2 in.) pipe mounting

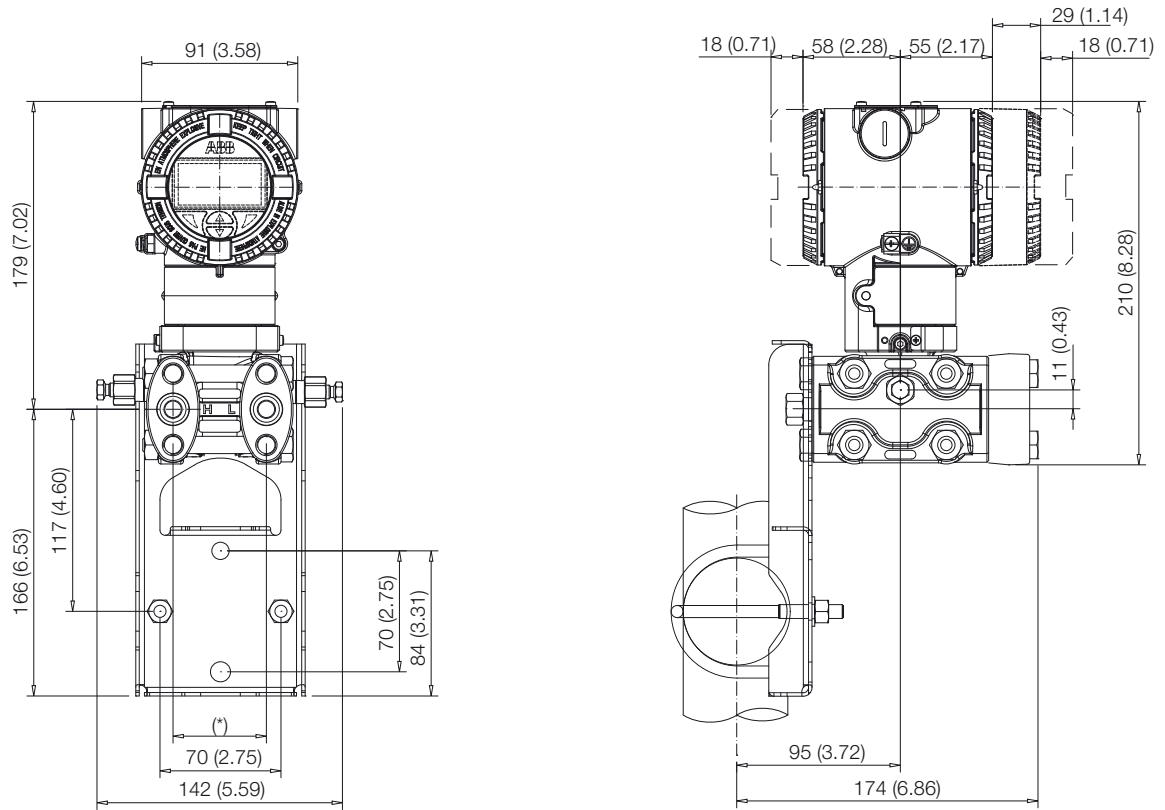


**Transmitter with DIN aluminium housing - horizontal flanges on bracket for vertical or horizontal 60 mm. (2 in.) pipe mounting**

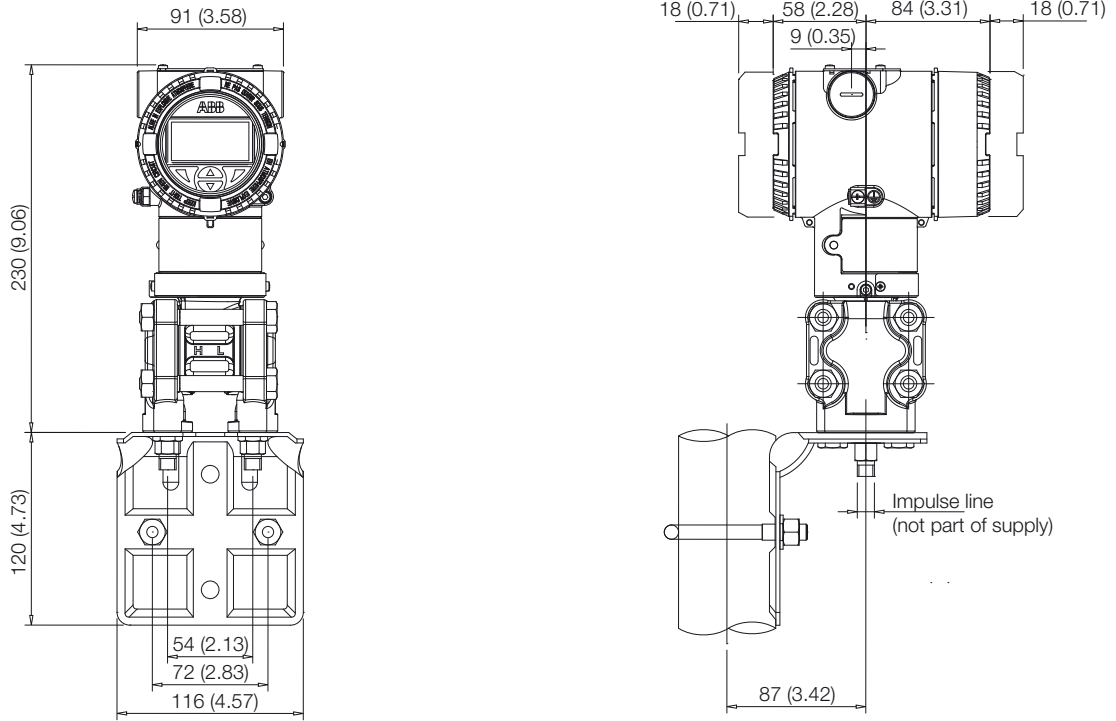


# Model 266DSH Differential

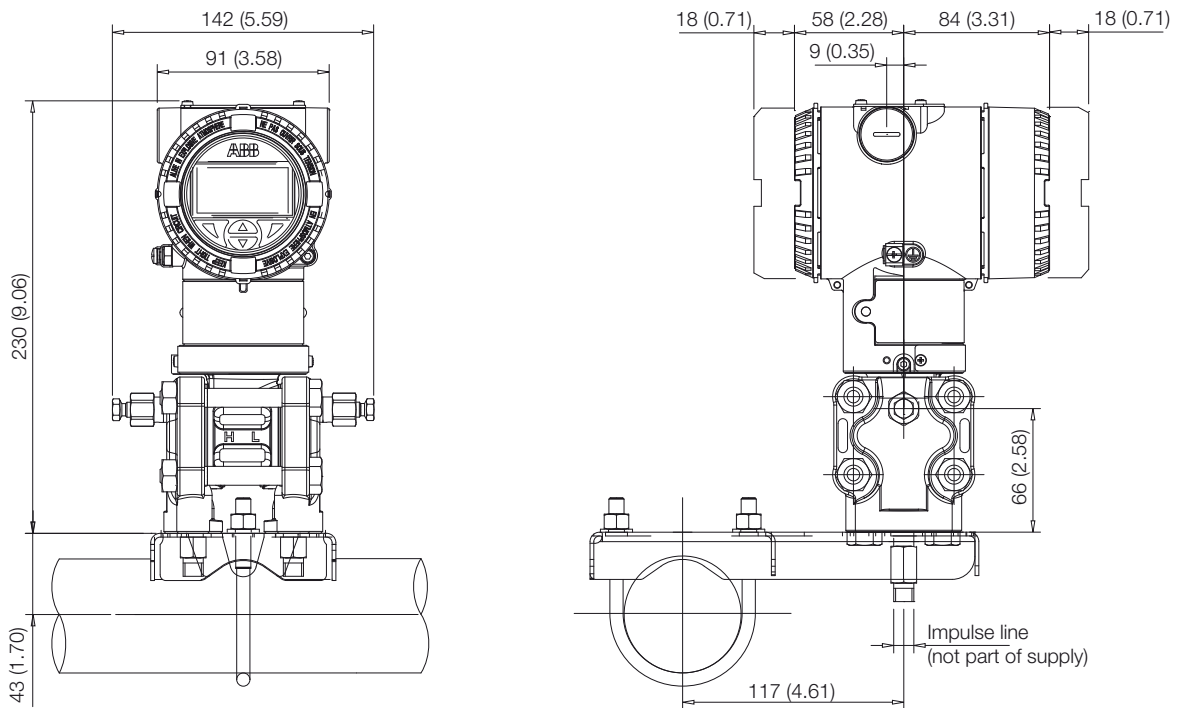
Transmitter with horizontal flanges on flat bracket for vertical or horizontal 60 mm. (2 in.) pipe mounting



**Transmitter with vertical flanges on bracket for vertical or horizontal 60 mm. (2 in.) pipe mounting**



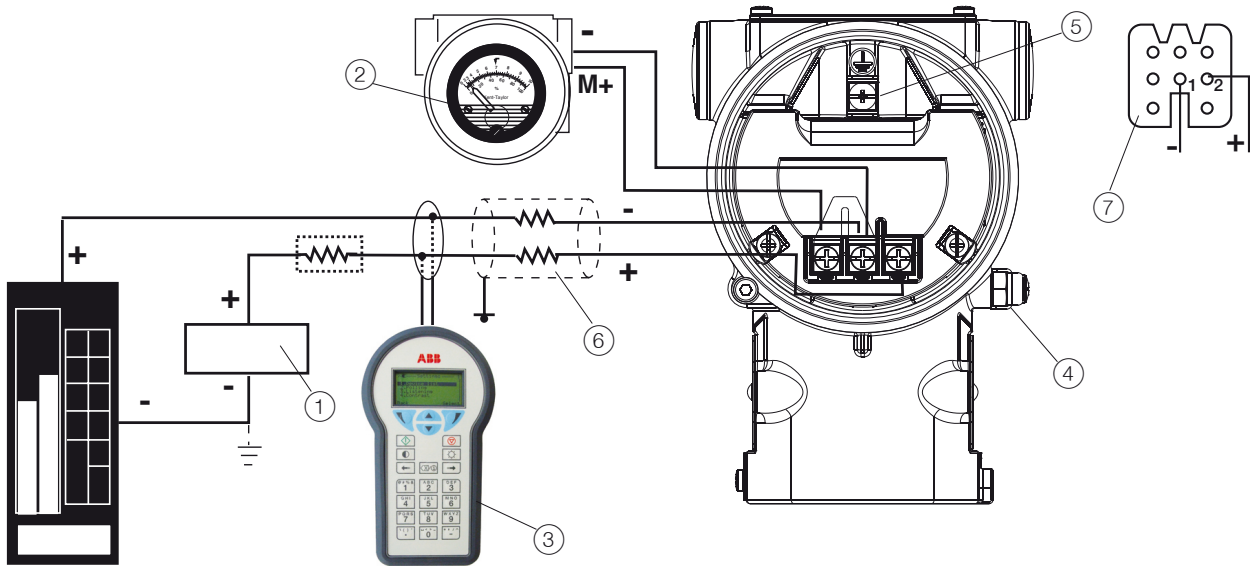
**Transmitter with vertical flanges on flat bracket for vertical or horizontal 60 mm. (2 in.) pipe mounting**



# Model 266DSH Differential

## Electrical connections

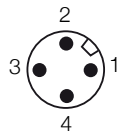
### HART Version



HART hand-held communicator may be connected at any wiring termination point in the loop, providing the minimum resistance is 250 ohm. If this is less than 250 ohm, additional resistance should be added to allow communications. Maximum voltage drop on external remote indicator is 0.7 V DC.

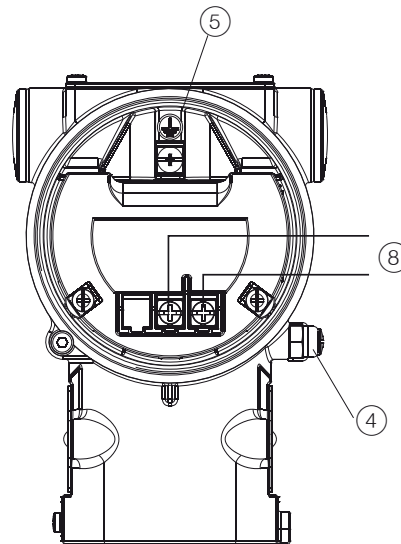
### FIELDBUS Versions

7/8 in connector      M12 x 1 connector



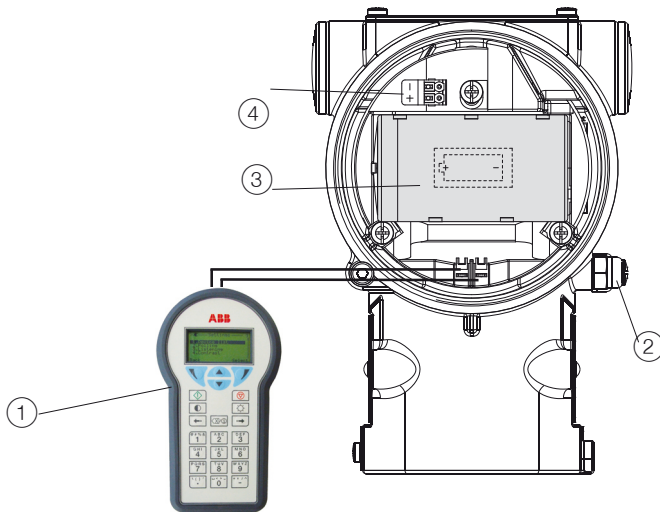
PIN (male) IDENTIFICATION		
	FOUNDATION Fieldbus	PROFIBUS PA
1	DATA -	DATA +
2	DATA +	GROUND
3	SHIELD	DATA -
4	GROUND	SHIELD

CONNECTOR IS SUPPLIED LOOSE  
WITHOUT MATING FEMALE PLUG



- ① Power source | ② Remote indicator | ③ Handheld communicator | ④ External ground termination point | ⑤ Internal ground termination point | ⑥ Line load | ⑦ Harting Han 8D socket insert for mating plug (supplied loose) | ⑧ Fieldbus line (polarity independent)

WirelessHART version



- ① Handheld communicator | ② External ground termination point | ③ Battery | ④ Fast connection for harvesting unit

# Model 266DSH Differential

## Ordering information

### BASIC ORDERING INFORMATION model 266DSH Differential Pressure Transmitter

Select one character or set of characters from each category and specify complete catalog number.

Refer to additional ordering information and specify one or more codes for each transmitter if additional options are required.

BASE MODEL - 1st to 6th characters				2 6 6 D S H	X	X	X	X	X	X	X
Differential Pressure Transmitter – BASE ACCURACY 0.06 %											
SENSOR - Span limits - 7th character											
0.05 and 1 kPa	0.5 and 10 mbar	0.2 and 4 inH2O	(Note 21)	A							
0.2 and 4 kPa	2 and 40 mbar	0.8 and 16 inH2O	(Note 21)	B							
0.54 and 16 kPa	5.4 and 160 mbar	2.16 and 64 inH2O	(Note 21)	E							
0.4 and 40 kPa	4 and 400 mbar	1.6 and 160 inH2O		F							
1.6 and 160 kPa	16 and 1600 mbar	6.4 and 642 inH2O		H							
6 and 600 kPa	0.06 and 6 bar	0.87 and 87 psi		M							
24 and 2400 kPa	0.24 and 24 bar	3.5 and 348 psi		P							
80 and 8000 kPa	0.8 and 80 bar	11.6 and 1160 psi		Q							
160 and 16000 kPa	1.6 and 160 bar	23.2 and 2320 psi	(Note 21)	S							
Application - 8th character											
Differential measurement at standard static pressure											S
Differential measurement at high static pressure											H
Gauge measurement											P
Diaphragm material / Fill fluid (wetted parts) - 9th character											
AISI 316 L ss		Silicone oil	(Note 2)	NACE							S
Hastelloy® C-276 (on AISI seat)		Silicone oil	(Note 20, 21)	NACE							H
Hastelloy® C-276		Silicone oil		NACE							K
Monel 400®		Silicone oil	(Notes 2, 21)	NACE							M
AISI 316 L ss gold plated		Silicone oil	(Notes 2, 21)	NACE							8
Tantalum		Silicone oil	(Notes 2, 21)	NACE							T
AISI 316 L ss		Inert fluid - Galden	(Notes 1, 2, 21)	NACE							A
Hastelloy® C-276		Inert fluid - Galden	(Notes 1, 2, 21)	NACE							F
Monel 400®		Inert fluid - Galden	(Notes 1, 2, 21)	NACE							C
AISI 316 L ss gold plated		Inert fluid - Galden	(Notes 1, 2, 21)	NACE							9
Tantalum		Inert fluid - Galden	(Notes 1, 2, 21)	NACE							D
AISI 316 L ss		Inert fluid - Halocarbon	(Notes 1, 2)	NACE							L
Hastelloy® C-276		Inert fluid - Halocarbon	(Notes 1, 2)	NACE							P
Monel 400v		Inert fluid - Halocarbon	(Notes 1, 2, 21)	NACE							4
AISI 316 L ss gold plated		Inert fluid - Halocarbon	(Notes 1, 2, 21)	NACE							I
Tantalum		Inert fluid - Halocarbon	(Notes 1, 2, 21)	NACE							5

continued  
see next page



<b>BASIC ORDERING INFORMATION model 266DSH Differential Pressure Transmitter</b>				<b>2</b>	<b>6</b>	<b>D</b>	<b>S</b>	<b>H</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Process flanges/adapters material and connection (wetted parts) - 10<sup>th</sup> character</b>												
AISI 316 L ss (Horizontal connection)	1/4 in. – 18 NPT-f direct			NACE						A		
AISI 316 L ss (Horizontal connection)	1/2 in. – 14 NPT-f through adapter			NACE						B		
Hastelloy® C-276 (Horizontal connection)	1/4 in. – 18 NPT-f direct	(Notes 3, 21)		NACE						D		
Hastelloy® C-276 (Horizontal connection)	1/2 in. – 14 NPT-f through adapter	(Notes 3, 21)		NACE						E		
AISI 316 L ss (Horizontal connection) - MWP= 16 MPa	1/4 in. – 18 NPT-f direct	(Notes 4, 21, 27)		NACE						Y		
AISI 316 L ss (Horizontal connection) - MWP= 16 MPa	1/2 in. – 14 NPT-f through adapter	(Notes 4, 21, 27)		NACE						W		
Monel 400® (Horizontal connection)	1/4 in. – 18 NPT-f direct	(Notes 3, 4, 21)		NACE						G		
Monel 400® (Horizontal connection)	1/2 in. – 14 NPT-f through adapter	(Notes 3, 4, 21)		NACE						H		
AISI 316 L ss (Vertical connection)	1/4 in. – 18 NPT-f direct	(Note 21)		NACE						Q		
AISI 316 L ss (Vertical connection)	1/2 in. – 14 NPT-f through adapter	(Note 21)		NACE						T		
Hastelloy® C-276 (Vertical connection)	1/4 in. – 18 NPT-f direct	(Notes 3, 21)		NACE						M		
Hastelloy® C-276 (Vertical connection)	1/2 in. – 14 NPT-f through adapter	(Notes 3, 21)		NACE						S		
Monel 400® (Vertical connection)	1/4 in. – 18 NPT-f direct	(Notes 3, 4, 21)		NACE						U		
Monel 400® (Vertical connection)	1/2 in. – 14 NPT-f through adapter	(Notes 3, 4, 21)		NACE						V		
PVDF Kynar® insert on AISI 316 ss flange side	1/4 in. – 18 NPT-f direct	(Notes 5, 6, 21)								P		
PVDF Kynar® insert on AISI 316 ss flange side	1/2 in. – 14 NPT-f direct	(Notes 5, 6, 21)								Z		
<b>Bolts/Gasket (wetted parts) - 11<sup>th</sup> character</b>												
For standard static, high static and gauge versions	AISI 316 ss	Viton®	(Notes 4, 7)									1
	AISI 316 ss	PTFE	(Notes 1, 4, 7)									2
For standard static and gauge versions	AISI 316 ss – MWP = 16 MPa	Viton®	(Note 7)	NACE								3
	AISI 316 ss – MWP = 16 MPa	PTFE	(Notes 1, 7)	NACE								4
For high static version	Stainless steel – MWP = 42 MPa	Viton®	(Note 7)	NACE								3
	Stainless steel – MWP = 42 MPa	PTFE	(Notes 1, 7)	NACE								4
For standard static, high static and gauge versions	Alloy steel	Viton®	(Notes 4, 7)	NACE								8
	Alloy steel	PTFE	(Notes 1, 4, 7)	NACE								9
For PVDF Kynar process connection	AISI 316 ss spring loaded – MWP = 1 MPa		(Note 8)	NACE								N

# Model 266DSH Differential

BASIC ORDERING INFORMATION model 266DSH Differential Pressure Transmitter				2	6	D	S	H	X	X	X	X	X	X	X
<b>Housing material and electrical connection</b> - 12 <sup>th</sup> character															
Aluminium alloy ( barrel version)	1/2 in. – 14 NPT		(Note 25)												A
Aluminium alloy ( barrel version)	M20 x 1.5 (CM 20)	(TO BE USED for WirelessHART)													B
Aluminium alloy ( barrel version)	Harting Han 8D connector	(general purpose only)	(Notes 9, 25)												E
Aluminium alloy ( barrel version)	Fieldbus connector	(general purpose only)	(Notes 9, 25)												G
AISI 316 L ss ( barrel version) (I2 or I3 required)	1/2 in. – 14 NPT		(Note 25)												S
AISI 316 L ss ( barrel version) (I2 or I3 required)	M20 x 1.5 (CM20)	(TO BE USED for WirelessHART)													T
AISI 316 L ss ( barrel version) (I2 or I3 required)	Fieldbus connector	(general purpose only)	(Notes 9, 25)												Z
AISI 316 L ss painted( barrel version) (I2 or I3 required)	1/2 in. – 14 NPT		(Note 25)												C
AISI 316 L ss painted ( barrel version) (I2 or I3 required)	M20 x 1.5 (CM20)	(TO BE USED for WirelessHART)													D
AISI 316 L ss painted ( barrel version) (I2 or I3 required)	Fieldbus connector	(general purpose only)	(Notes 9, 25)												F
Aluminium alloy (DIN version)	M20 x 1.5 (CM20)	(not Ex d or XP)	(Notes 25, 28)												J
Aluminium alloy (DIN version)	Harting Han 8D connector	(general purpose only)	(Notes 9, 25, 28)												K
Aluminium alloy (DIN version)	Fieldbus connector	(general purpose only)	(Notes 9, 25, 28)												W
<b>Output/Additional options</b> - 13 <sup>th</sup> character															
HART and 4 to 20 mA - Standard functionality	No additional options		(Notes 10, 11)												L
HART and 4 to 20 mA - Standard functionality	Options requested by "Additional ordering code"	(Note 10)													7
HART and 4 to 20 mA - Advanced functionality (includes option R1)	No additional options		(Notes 10, 11)												H
HART and 4 to 20 mA - Advanced functionality (includes option R1)	Options requested by "Additional ordering code"	(Note 10)													1
PROFIBUS PA (includes option R1)	No additional options		(Notes 10, 11)												P
PROFIBUS PA (includes option R1)	Options requested by "Additional ordering code"	(Note 11)													2
FOUNDATION Fieldbus (includes option R1)	No additional options		(Notes 10, 11)												F
FOUNDATION Fieldbus (includes option R1)	Options requested by "Additional ordering code"	(Note 11)													3
HART and 4 to 20 mA Safety, certified to IEC 61508 (includes option R1)	No additional options		(Notes 10, 11)												T
HART and 4 to 20 mA Safety, certified to IEC 61508 (includes option R1)	Options requested by "Additional ordering code"	(Note 10)													8
WirelessHART (includes option R1)	No additional options		(Note 24)												W
WirelessHART (includes option R1)	Options requested by "Additional ordering code"	(Note 24)													9

NOTE - Option R1 represents the external pushbuttons

## ADDITIONAL ORDERING INFORMATION for model 266DSH

Add one or more 2-digit code(s) after the basic ordering information to select all required options

				XX	XX	XX
<b>Accuracy</b>						
0.04 % accuracy for applicable ranges			(Notes 7, 21, 22, 25)	D2		
<b>Drain/vent valve (material and position) (wetted parts)</b>						
AISI 316 L ss	on process axis	(Notes 7, 12)	NACE			V1
AISI 316 L ss	on flange side top	(Notes 7, 13, 21)	NACE			V2
AISI 316 L ss	on flange side bottom	(Notes 7, 13, 21)	NACE			V3
Hastelloy® C-276	on process axis	(Notes 7, 14)	NACE			V4
Hastelloy® C-276	on flange side top	(Notes 7, 15, 21)	NACE			V5
Hastelloy® C-276	on flange side bottom	(Notes 7, 15, 21)	NACE			V6
Monel 400®	on process axis	(Notes 7, 16, 21)	NACE			V7
Monel 400®	on flange side top	(Notes 7, 17, 21)	NACE			V8
Monel 400®	on flange side bottom	(Notes 7, 17, 21)	NACE			V9
<b>Hazardous area certifications</b>						
ATEX Intrinsic Safety Ex ia			(Notes 10, 11)			E1
ATEX Explosion Proof Ex d			(Notes 10, 11, 18, 25)			E2
ATEX Type „N“			(Notes 10, 11, 25)			E3
Combined ATEX - Intrinsic Safety, Explosion Proof and Type „N“			(Notes 10, 11, 18, 25)			EW
Combined ATEX - Intrinsic Safety and Explosion Proof			(Notes 10, 11, 18, 25)			E7
Combined ATEX, IECEx, FM Approvals (USA) and FM Approvals (Canada)			(Notes 10, 11, 18, 25)			EN
FM Approvals (Canada) approval			(Notes 10, 11, 18, 25)			E4
FM Approvals (USA) approval			(Notes 10, 11, 18, 25)			E6
FM Approvals (USA and Canada) Intrinsic Safety			(Notes 10, 11)			EA
FM Approvals (USA and Canada) Explosion Proof			(Notes 10, 11, 18, 25)			EB
FM Approvals (USA and Canada) Nonincendive			(Notes 10, 11, 25)			EC
IECEX Intrinsic Safety Ex ia			(Notes 10, 11)			E8
IECEX Explosion Proof Ex d			(Notes 10, 11, 18, 25)			E9
IECEX Type „N“ Ex nL			(Notes 10, 11, 25)			ER
Combined IECEx - Intrinsic Safety, Explosion Proof and Type „N“			(Notes 10, 11, 18, 25)			EI
Combined IECEx - Intrinsic Safety and Explosion Proof			(Notes 10, 11, 18, 25)			EH
NEPSI Intrinsic Safety Ex ia			(Notes 10, 11, 25)			EY
NEPSI Explosion Proof Ex d			(Notes 10, 11, 18, 25)			EZ
NEPSI Type „N“			(Notes 10, 11, 25)			ES
Combined NEPSI - Intrinsic Safety, Explosion Proof and Type „N“			(Notes 10, 11, 18, 25)			EQ
Combined NEPSI - Intrinsic Safety and Explosion Proof			(Notes 10, 11, 18, 25)			EP
Combined Intrinsic Safety - ATEX, IECEx and FM Approvals (USA and Canada)			(Note 26)			EF

# Model 266DSH Differential

<b>ADDITIONAL ORDERING INFORMATION for model 266DSH</b>		<b>XX</b>	<b>XX</b>	<b>XX</b>	<b>XX</b>	<b>XX</b>
<b>Other hazardous area certifications (ONLY AS ALTERNATIVE TO BASIC CERTIFICATION CODE Ex)</b>						
Technical Regulations Customs Union (EAC) Intrinsic Safety Ex ia for Russia	(Notes 10, 11, 25)	W1				
Technical Regulations Customs Union (EAC) Explosion Proof Ex d for Russia	(Notes 10, 11, 18, 25)	W2				
Technical Regulations Customs Union (EAC) combined Ex ia and Ex d for Russia	(Notes 10, 11, 18, 25)	WC				
Technical Regulations Customs Union (EAC) Intrinsic Safety Ex ia for Kazakhstan	(Notes 10, 11, 25)	W3				
Technical Regulations Customs Union (EAC) Explosion Proof Ex d for Kazakhstan	(Notes 10, 11, 18, 25)	W4				
Technical Regulations Customs Union (EAC) combined Ex ia and Ex d for Kazakhstan	(Notes 10, 11, 18, 25)	WD				
Inmetro (Brazil) Ex ia	(Notes 10, 11, 25)	W5				
Inmetro (Brazil) Ex d	(Notes 10, 11, 18, 25)	W6				
Inmetro (Brazil) Ex nL	(Notes 10, 11, 25)	W7				
Combined Inmetro (Brazil) - Intrinsic Safety, Explosion Proof and Type „N“	(Notes 10, 11, 18, 25)	W8				
Technical Regulations Customs Union (EAC) Intrinsic Safety Ex ia for Belarus	(Notes 10, 11, 25)	WF				
Technical Regulations Customs Union (EAC) Explosion Proof Ex d for Belarus	(Notes 10, 11, 18, 25)	WG				
Technical Regulations Customs Union (EAC) combined Ex ia and Ex d for Belarus	(Notes 10, 11, 18, 25)	WH				
Kosha (Korea) Intrinsic Safety Ex ia IIC T6, IP67	(Notes 10, 11, 23, 25)	WM				
Kosha (Korea) Explosion Proof Ex d IIC T6, IP67	(Notes 10, 11, 18, 23, 25)	WN				
Combined Kosha (Korea) - Intrinsic Safety and Explosion Proof	(Notes 10, 11, 18, 23, 25)	WP				
<b>Integral LCD</b>						
Digital LCD integral display with integrated keypad	(Note 23)	L1				
Digital LCD integral display with TTG (Through-The-Glass) activated keypad	(Note 23)	L5				
Standard Digital LCD integral display (ONLY SELECTABLE WITH OUTPUT CODE 7)		L9				
<b>External non intrusive Z, S and WP pushbuttons</b>						
Transmitters with external pushbutton (ONLY SELECTABLE WITH OUTPUT CODE 7)						R1
<b>Mounting bracket (shape and material)</b>						
For pipe mounting - Carbon steel	(Not suitable for AISI housing)					B1
For pipe mounting - AISI 316 L ss						B2
For wall mounting - Carbon steel	(Not suitable for AISI housing)					B3
For wall mounting - AISI 316 L ss						B4
Flat type for box - AISI 316 ss						B5
<b>Surge</b>						
Surge/Transient Protector	(Note 25)					S2

<b>ADDITIONAL ORDERING INFORMATION for model 266DSH</b>	<b>XX</b>	<b>XX</b>	<b>XX</b>	<b>XX</b>	<b>XX</b>	<b>XX</b>
<b>Operating manual (multiple selection allowed)</b>						
German (ONLY FOR HART and PROFIBUS VERSIONS)	M1					
Italian (ONLY FOR HART VERSION)	M2					
Spanish (ONLY FOR HART VERSION)	M3					
French (ONLY FOR HART VERSION)	M4					
English	M5					
Chinese (ONLY FOR HART VERSION)	M6					
Swedish (ONLY FOR HART VERSION)	M7					
Polish (ONLY FOR HART VERSION)	M9					
Portuguese (ONLY FOR HART VERSION)	MA					
Russian (ONLY FOR HART VERSION)	MB					
Dutch (ONLY FOR HART VERSION)	MD					
Danish (ONLY FOR HART VERSION)	MF					
Japanese (ONLY FOR HART VERSION)	MJ					
Romenian (ONLY FOR HART VERSION)	MR					
Turkish (ONLY FOR HART VERSION)	MT					
<b>Plates language</b>						
German	T1					
Italian	T2					
Spanish	T3					
French	T4					
<b>Additional tag plate</b>						
Supplemental wired-on stainless steel plate					I1	
Tag and certification stainless steel plates and laser printing of tag					I2	
Tag, certification and supplemental wired-on stainless steel plates and laser printing of tag					I3	
<b>Configuration</b>						
Standard – Pressure = inH2O/ psi at 68 °F; Temperature = deg. F						N2
Standard – Pressure = inH2O/ psi at 39.2 °F; Temperature = deg. F						N3
Standard – Pressure = inH2O/ psi at 20 °C; Temperature = deg. C						N4
Standard – Pressure = inH2O/ psi at 4 °C; Temperature = deg. C						N5
Custom						N6
<b>Preparation procedure</b>						
Oxygen service cleaning (only available with inert fill and PTFE gasket)					(Note 21)	P1
Pmax =12 MPa for Galden, 9 MPa for Halocarbon; Tmax=60 °C/140 °F						
<b>Certificates (multiple selection allowed)</b>						
Inspection certificate EN 10204–3.1 of calibration (9-point)						C1
Inspection certificate EN 10204–3.1 of the cleanliness stage						C3
Inspection certificate EN 10204–3.1 of helium leakage test of the sensor module						C4
Inspection certificate EN 10204–3.1 of the pressure test						C5
Certificate of compliance with the order EN 10204–2.1 of instrument design						C6
Printed record of configured data of transmitter						CG
PMI test of wetted parts						CT

# Model 266DSH Differential

ADDITIONAL ORDERING INFORMATION FOR MODEL 266DSH			XX	XX	XX	XX	XX
<b>Approvals</b>							
GOST (Russia) Metrologic Pattern	(NOT APPLICABLE WITH ANY HAZARDOUS AREA CERTIFICATION)		Y1				
GOST (Kazakhstan) Metrologic Pattern	(NOT APPLICABLE WITH ANY HAZARDOUS AREA CERTIFICATION)		Y2				
GOST (Belarus) Metrologic Pattern	(NOT APPLICABLE WITH ANY HAZARDOUS AREA CERTIFICATION)		Y4				
Chinese pattern	(NOT APPLICABLE WITH ANY HAZARDOUS AREA CERTIFICATION)		Y5				
DNV approval		(Notes 23, 25)		YA			
Approval for Custody transfer (PENDING)				YC			
Conformity to NAMUR NE 021 (2004)	(NOT APPLICABLE WITH SURGE PROTECTOR CODE "S2")	(Notes 23, 25, 30)		YE			
<b>Material traceability</b>							
Certificate of compliance with the order EN 10204–2.1 of process wetted parts							H1
Inspection certificate EN 10204–3.1 of process wetted parts							H3
Test report EN 10204–2.2 of pressure bearing and process wetted parts							H4
<b>Connector</b>							
Fieldbus 7/8 in. (Recommended for FOUNDATION Fieldbus) - (supplied loose without mating female plug)			(Notes 11, 19, 25)				U1
Fieldbus M12x1 (Recommended for PROFIBUS PA) - (supplied loose without mating female plug)			(Notes 11, 19, 25)				U2
Harting Han 8D – straight entry - (supplied loose)			(Notes 10, 19, 25)				U3
Harting Han 8D – angle entry - (supplied loose)			(Notes 10, 19, 25)				U4
<b>Accessory</b>							
Manifold mounting and pressure test (NOT AVAILABLE WITH OXYGEN SERVICE CLEANING - PREPARATION PROCEDURE CODE P1							A1
or WITH VERTICAL FLANGES WHEN SELECTED WITH BRACKET CODE Bx)		(Note 29)					

- Note 1: Suitable for oxygen service
- Note 2: Not available with sensor code A and B
- Note 3: Not available with AISI 316L ss or Hastelloy C-276 (on AISI seat) diaphragms code S, H, A, L
- Note 4: Not available with sensor code A
- Note 5: Not available with Diaphragm material/Fill fluid code S, H, K, M, A, F, C, L, P, 4
- Note 6: Not available with sensor code A, Q, S
- Note 7: Not available with Process Flanges/Adapters material/connection code P, Z
- Note 8: Not available with Process Flanges/Adapters material/connection code A, B, D, E, G, H, Q, T, M, S, U, V, Y, W
- Note 9: Select type in additional ordering code
- Note 10: Not available with Housing code G, Z, W, F
- Note 11: Not available with Housing code E, K
- Note 12: Not available with Process flanges/adapters material/connection code D, E, G, H, Q, T, M, S, U, V, Y, W
- Note 13: Not available with Process flanges/adapters material/connection code D, E, G, H, M, S, U, V
- Note 14: Not available with Process flanges/adapters material/connection code A, B, G, H, Q, T, M, S, U, V, Y, W
- Note 15: Not available with Process flanges/adapters material/connection code A, B, G, H, Q, T, U, V, Y, W
- Note 16: Not available with Process flanges/adapters material/connection code A, B, D, E, Q, T, M, S, U, V, Y, W
- Note 17: Not available with Process flanges/adapters material/connection code A, B, D, E, Q, T, M, S, Y, W
- Note 18: Not available with Housing code J, K, W
- Note 19: Not available with Housing code A, B, S, T, J
- Note 20: Not available with sensor code E, F, G, H, M, P, Q, and S
- Note 21: Not available with high static pressure code H
- Note 22: Not available with sensor code A, B, E, S
- Note 23: Not available with Output code 7
- Note 24: Not available with Housing code A, E, G, S, Z, C, F, J, K, W
- Note 25: Not available with Output code 9, W
- Note 26: Not available with Output code 1, 2, 3, 7, 8
- Note 27: Not available with sensor code S
- Note 28: Not available with Process flanges/adapters material/connection code Y, W
- Note 29: Not available with Process Flanges/Adapters material/connection code B, E, W, H, T, S, V
- Note 30: Not available with Output code 2, 3

### **Standard delivery items (can be differently specified by additional ordering code)**

- Adapters supplied loose
- Plug on axis of horizontal connection flange or on side bottom for horizontal connection flange with MWP= 16 MPa; nothing for PVDF Kynar insert or for vertical connection flange (no drain/vent valves)
- General purpose (no electrical certification)
- No display, no mounting bracket, no surge protection
- Multilanguage short-form operating instruction manual and labels in english (metal nameplate; self-adhesive certification and tag)
- Configuration with kPa and deg. C units
- No test, inspection or material traceability certificates

### **IMPORTANT REMARK FOR ALL MODELS**

THE SELECTION OF SUITABLE WETTED PARTS AND FILLING FLUID FOR COMPATIBILITY WITH THE PROCESS MEDIA IS A CUSTOMER'S RESPONSIBILITY, IF NOT OTHERWISE NOTIFIED BEFORE MANUFACTURING.

### **NACE COMPLIANCE INFORMATION**

- (1) The materials of constructions comply with metallurgical recommendations of NACE MR0175/ISO 15156 for sour oil field production environments. As specific environmental limits may apply to certain materials, please consult latest standard for further details. AISI 316/316 L, Hastelloy C-276, Monel 400 also conform to NACE MR0103 for sour refining environments.
  - (2) NACE MR-01-75 addresses bolting requirements in two classes:
    - Exposed bolts: bolts directly exposed to the sour environment or buried, incapsulated 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.
- 266DSH bolting identified by "NACE" are in compliance with requirements of NACE MR0175 when considered "exposed bolting".

© Hastelloy is a registered trademark of Haynes International  
© Monel is a registered trademark of Special Metals Corporation  
© Viton is a registered trademark of E.I. DuPont de Nemour  
© Galden is a registered trademark of Solvay Group  
© Halocarbon is a registered trademark of Halocarbon Products Co.  
© Kynar is a registered trademark of Arkema Inc.  
© HART and WirelessHART are registered trademarks of HART Communication Foundation  
© PROFIBUS is a registered trademark of Profibus International  
™ FOUNDATION Fieldbus is a trademark of Fieldbus Foundation

# Contact us

## **ABB Ltd.**

### **Process Automation**

Howard Road  
St. Neots  
Cambridgeshire PE19 8EU  
UK  
Tel: +44 (0)1480 475321  
Fax: +44 (0)1480 217948

## **ABB Inc.**

### **Process Automation**

125 E. County Line Road  
Warminster  
PA 18974  
USA  
Tel: +1 215 674 6000  
Fax: +1 215 674 7183

## **ABB Automation Products GmbH**

### **Process Automation**

Schillerstr. 72  
32425 Minden  
Germany  
Tel: +49 551 905 534  
Fax: +49 551 905 555

## **ABB S.p.A.**

### **Process Automation**

Via Luigi Vaccani 4  
22016 Tremezzina (CO)  
Italy  
Tel: +39 0344 58111

[www.abb.com](http://www.abb.com)

## Note

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents - in whole or in parts - is forbidden without prior written consent of ABB.

Copyright© 2015 ABB  
All rights reserved

3KXP300007R1001



Sales



Service



Software