



# DPT 200

## Differential Pressure Transmitter for Process Industry with HART®-Communication

accuracy according to IEC 60770:  
0.075 % FSO

### Differential pressure

from 1 mbar up to 20 bar

### Static pressure

max. 400 bar

### Output signal

2-wire: 4 ... 20 mA

### Special characteristics

- ▶ static over pressure 400 bar
- ▶ rangeability max. 100:1
- ▶ aluminium die cast case
- ▶ HART®-communication
- ▶ output signal: linear or square root extraction






### Optional versions

- ▶ Ex-version group I
  - Ex ia = intrinsically safe version for firedamp mines
- ▶ Ex-version group II
  - Ex ia = intrinsically safe version
  - Ex d = flameproof enclosure
- ▶ LC display
- ▶ stainless steel housing

The differential pressure transmitter DPT 200 has been especially designed for the process industry and can be used for level measurement of closed, pressurized tanks, pump or filter controlling, etc.

The possibility passes different pressure seals at the DPT 200 adding with different membrane materials to reach an optimal adaptation to the application.

### Preferred areas of use are

-  Oil and gas industry
-  Chemical and petrochemical industry
-  Energy industry
-  Food and beverage
-  Paper industry



| Differential pressure ranges   |  |                 |                                |                  |                |
|--|--|-----------------|--------------------------------|------------------|----------------|
| Sensor type  | A  | B               | C                              | D                | E              |
| Differential pressure range dp                                       | 10 mbar  | 60 mbar         | 400 mbar                       | 2.5 bar          | 20 bar         |
| Setting limits (offset and span in this range freely adjustable)     | -10 ... 10 mbar  | -60 ... 60 mbar | -400 ... 400 mbar              | -2.5 ... 2.5 bar | -20 ... 20 bar |
| Lowest permissible span  | 1 mbar   | 2 mbar          | 4 mbar                         | 25 mbar          | 200 mbar       |
| Permissible static pressure  | 70 bar   | 160 bar         | 160 bar                        | 160 bar          | 160 bar        |
| optional   | -  | -               | 400 bar                        | 400 bar          | 400 bar        |
| Rangeability TD (with respect to the differential pressure range dp) | 10:1   | 30:1            | 100:1                          | 100:1            | 100:1          |
| Output signal / Supply   |  |                 |                                |                  |                |
| Standard   | 2-wire: 4 ... 20 mA with HART® communication / $V_S = 12 \dots 42 V_{DC}$<br>with optional display: $V_S = 15 \dots 42 V_{DC}$   |                 |                                |                  |                |
| Option IS-version  | 2-wire: 4 ... 20 mA with HART® communication / $V_S = 16.5 \dots 28 V_{DC}$ (with or without display)  |                 |                                |                  |                |
| Error signal Namur NE43  | high / low (adjustable)  |                 |                                |                  |                |
| Performance  |  |                 |                                |                  |                |
| Accuracy   | turn-down $\leq 10:1$ : $\leq \pm 0.075$ % FSO<br>turn-down $> 10:1$ : $\leq \pm [0.0075 \times \text{turn-down}]$ % FSO<br>with turn-down = nominal pressure range / adjusted range<br>(FSO = Full Scale Output)  |                 |                                |                  |                |
| Influence supply   | $\leq 0.001$ % FSO / 10 V  |                 |                                |                  |                |
| Influence static pressure  | type A: $\pm [0.015 \text{ mbar} + 0.1 \text{ \% of the adjusted range}] / 40 \text{ bar}$<br>type B: $\pm [0.06 \text{ mbar} + 0.075 \text{ \% of the adjusted range}] / 160 \text{ bar}$<br>type C: $\pm [0.2 \text{ mbar} + 0.05 \text{ \% of the adjusted range}] / 160 \text{ bar}$<br>type D: $\pm [1.25 \text{ mbar} + 0.05 \text{ \% of the adjusted range}] / 160 \text{ bar}$<br>type E: $\pm [10 \text{ mbar} + 0.05 \text{ \% of the adjusted range}] / 160 \text{ bar}$ |                 |                                |                  |                |
| Influence installation position                                      | max. 400 Pa (can be compensated by zero-point correction)  |                 |                                |                  |                |
| Long term stability  | type A: $\leq \pm (0.5 \text{ \%} \times \text{differential pressure range dp}) / \text{year}$ at reference conditions<br>type B: $\leq \pm (0.2 \text{ \%} \times \text{differential pressure range dp}) / \text{year}$ at reference conditions<br>type C - E: $\leq \pm (0.1 \text{ \%} \times \text{differential pressure range dp}) / \text{year}$ at reference conditions   |                 |                                |                  |                |
| Permissible load   | without LC-display: $R_{max} = [(V_S - 12 \text{ V}) / 0.023 \text{ A}] \Omega$<br>with LC-display: $R_{max} = [(V_S - 15 \text{ V}) / 0.023 \text{ A}] \Omega$<br>HART®-communication: $R = 230 \Omega \dots 600 \Omega$  |                 |                                |                  |                |
| Response time  | type A: approx. 1.6 sec<br>type B: approx. 0.4 sec<br>type C: approx. 0.2 sec<br>type D: approx. 0.2 sec<br>type E: approx. 0.1 sec  |                 |                                |                  |                |
| Damping  | electronic: 0.1 ... 60 sec plus response time  |                 |                                |                  |                |
| Thermal effects (Offset and Span)                                    |  |                 |                                |                  |                |
| Temperature range -20 ... +65 °C                                     | type A: $\pm [0.45 \times \text{turn-down} + 0.25]$ % of the adjusted range<br>type B: $\pm [0.30 \times \text{turn-down} + 0.20]$ % of the adjusted range<br>type C - E: $\pm [0.20 \times \text{turn-down} + 0.10]$ % of the adjusted range  |                 |                                |                  |                |
| Temperature range -40 ... -20 °C and +65 ... +100 °C                 | type A: $\pm [0.45 \times \text{turn-down} + 0.25]$ % of the adjusted range<br>type B: $\pm [0.30 \times \text{turn-down} + 0.20]$ % of the adjusted range<br>type C - E: $\pm [0.20 \times \text{turn-down} + 0.10]$ % of the adjusted range  |                 |                                |                  |                |
| Permissible temperatures   |  |                 |                                |                  |                |
| Environment / storage  | without display: -40 ... 85 °C<br>with display: -20 ... 65 °C (85 °C without function)   |                 |                                |                  |                |
| Media wetted parts   | silicone oil: -40 ... 100 °C (information: +125 °C short time, max. 30 min.)<br>fluorolube oil: -40 ... 100 °C (information: +125 °C short time, max. 30 min.)   |                 |                                |                  |                |
| Electrical protection  |  |                 |                                |                  |                |
| Short-circuit protection   | permanent  |                 |                                |                  |                |
| Reverse polarity protection  | no damage, but also no function  |                 |                                |                  |                |
| Mechanical stability   |  |                 |                                |                  |                |
| One-sided overload   | according to the maximum static pressure of differential pressure sensor   |                 |                                |                  |                |
| Vibration  | 5 g RMS (25 ... 2000 Hz)   |                 | according to DIN EN 60068-2-6  |                  |                |
| Shock  | 100 g / 1 msec   |                 | according to DIN EN 60068-2-27 |                  |                |
| Filling fluids   |  |                 |                                |                  |                |
| Standard   | silicone oil (-40...125 °C)  |                 |                                |                  |                |
| Option (on request)  | fluorolube oil (-40...125 °C)  |                 | others on request              |                  |                |

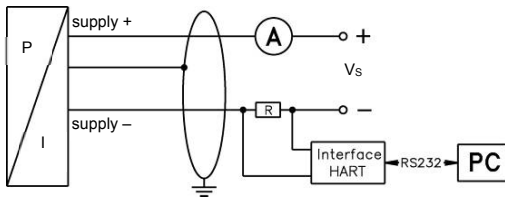
| <b>Materials</b>   |  |                   |
|--|--|-------------------|
| Pressure port / flange                                   | stainless steel 1.4401 (316)   | others on request |
| Housing  | standard: aluminium die cast with epoxy painting (blue)<br>option: stainless steel 1.4301 (304)  | others on request |
| Cable gland  | aluminium die cast housing: PA grey (for cable-Ø 5 ... 9 mm)<br>stainless steel housing: stainless steel 1.4404 (316L) (for cable-Ø 7 ... 12 mm)<br>option IS-version: specified under "Explosion protection"  |                   |
| Vent and dump valves, blanking plugs, type plate         | stainless steel 1.4401 (316)   | others on request |
| Bolts and nuts   | steel, zinc flake coated   |                   |
| Seals  | standard: FKM (-30 ... 250 °C)<br>options: EPDM (-40 ... 125 °C)<br>NBR (-40 ... 125 °C)<br>PTFE (-180 ... 250 °C)   | others on request |
| Diaphragm  | standard: stainless steel 1.4435 (316L)<br>option: Hastelloy® C-276 (2.4819)   | others on request |
| Media wetted parts                                       | pressure port, seal, diaphragm   |                   |
| <b>Explosion protection – aluminium die cast housing</b> |  |                   |
| Approval AX18-DPT200 intrinsically safe version          | IBExU 14 ATEX 1273 X / IECEx IBE 16.0005X<br>group II: II 1/2G Ex ia IIC T4 Ga/Gb / II 2D Ex ia IIIC T 85 °C Db<br>safety technical maximum values: P <sub>i</sub> = 660 mW, U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, C <sub>i</sub> = 29.7 nF, L <sub>i</sub> negligible<br>permissible temperatures for environment: -40 ... 60 °C<br>cable gland in PA grey; for cable-Ø 5 ... 9 mm   |                   |
| Approval AX18B-DPT200 flameproof enclosure               | IBExU 15 ATEX 1110 X / IECEx IBE 16.0006X<br>group II: II 2G Ex db IIC T6 Gb<br>permissible temperatures for environment: -40 ... 65 °C<br>cable gland in brass; for cable-Ø 10 ... 14 mm  |                   |
| <b>Explosion protection – stainless steel housing</b>    |  |                   |
| Approval AX18-DPT200 intrinsically safe version          | IBExU 14 ATEX 1273 X / IECEx IBE 16.0005X<br>group I (mines): I M1 Ex ia I Ma<br>group II: II 1G Ex ia IIC T4 Ga / II 2D Ex ia IIIC T85°C Db<br>safety technical maximum values: P <sub>i</sub> = 660 mW, U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, C <sub>i</sub> = 29.7 nF, L <sub>i</sub> negligible<br>permissible temperatures for environment: -40 ... 60 °C<br>cable gland in stainless steel 1.4404 (316L); for cable-Ø 7 ... 12 mm |                   |
| <b>Miscellaneous</b>                                     |  |                   |
| Display (optionally)                                     | type: LCD, lines: 2, digits: 8, bargraph: 0...100%,<br>rotatability: 90°-steps and / or by turn of the electronic case   |                   |
| Configuration  | - offset / span local via 2 buttons<br>- local configuration with an optional display<br>- complete configuration via HART®  |                   |
| Mounting bracket (optionally)                            | material CF8M or stainless steel 304 / 1.4401<br>weight 0.45 kg (inclusive bolts and nuts)   |                   |
| Ingress protection                                       | IP 67  |                   |
| Installation position                                    | any  |                   |
| Weight   | approx. 3 kg (depending on version)  |                   |
| Current consumption                                      | approx. 23 mA  |                   |
| Operational life   | 100 million load cycles  |                   |
| CE-conformity  | EMC Directive: 2014/30/EU  |                   |
| ATEX Directive   | 2014/34/EU   |                   |
| <b>Connections</b>                                       |  |                   |
| Electrical connection                                    | terminal clamps in clamping chamber (for cable-Ø max.2.5 mm <sup>2</sup> )   |                   |
| Process connections                                      | standard: internal thread 1/4" - 18 NPT / fixing 7/16 UNF<br>options: internal thread 1/4" - 18 NPT / fixing M10<br>internal thread 1/4" - 18 NPT, vertical / fixing 7/16 UNF<br>internal thread 1/4" - 18 NPT, vertical / fixing M10<br>internal thread 1/2" NPT, with adapter<br>internal thread M20x1.5, with adapter<br>with volume reduced flange<br>others on request  |                   |

# DPT 200

Differential Pressure Transmitter

Technical Data

## Wiring diagram

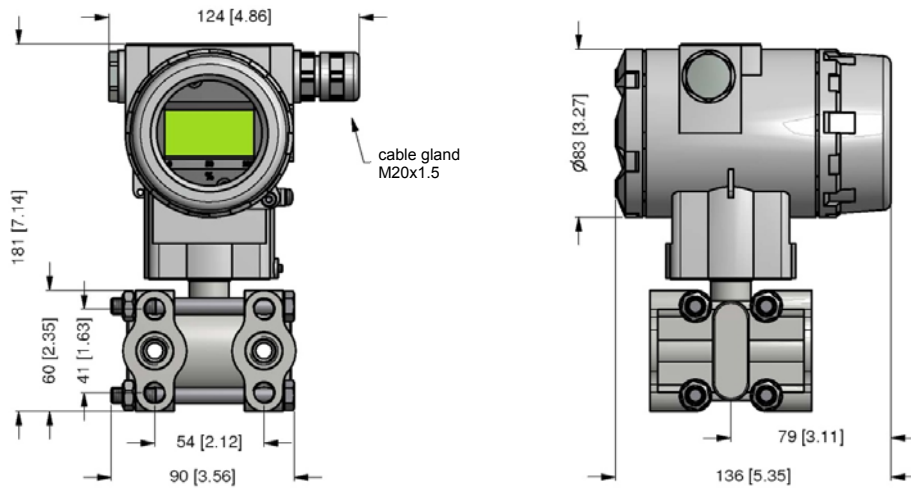


## Pin configuration

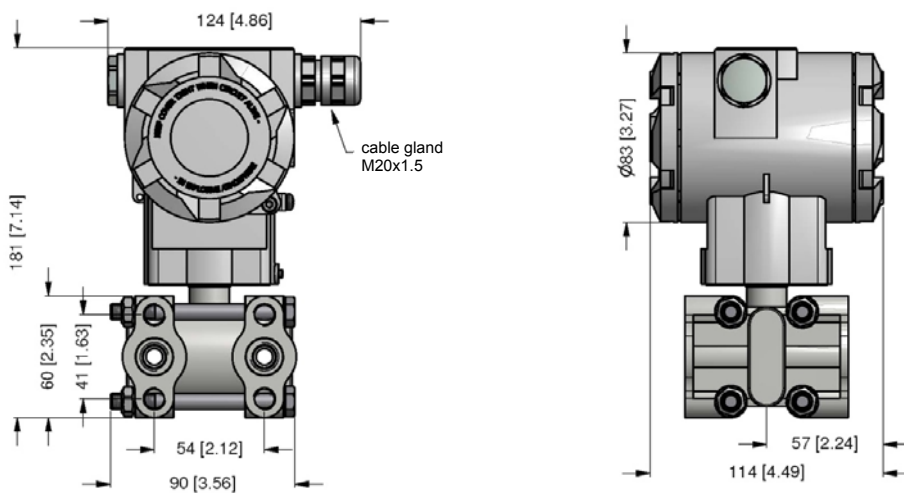
| Electrical connection       | terminal clamps |
|-----------------------------|-----------------|
| Supply + ( $V_s +$ )        | +               |
| Supply / Test - ( $V_s -$ ) | -               |
| Test +                      | TEST +          |
| Ground                      | $\oplus$        |

## Dimensions (mm / in)

### DPT 200 with display



### DPT 200 without display



HART® is a registered trade mark of HART Communication Foundation; Hastelloy® is a brand name of Haynes International Inc.

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