BD|SENSORS
pressure measurement

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.

DPT 200 can be equipped with various chemical seals and 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

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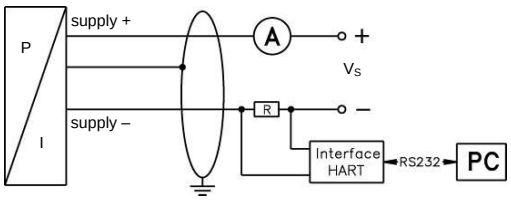
Differential pressure ranges					
Sensor type	A	B	C	D	E
Differential pressure range dp	10 mbar	60 mbar	400 mbar	2.5 bar	20 bar
Setting limits (offset and span in this range freely adjustable)	-10 ... 10 mbar	-60 ... 60 mbar	-400 ... 400 mbar	-2.5 ... 2.5 bar	-20 ... 20 bar
Lowest permissible span	1 mbar	2 mbar	4 mbar	25 mbar	200 mbar
Permissible static pressure optional	70 bar -	160 bar -	160 bar 400 bar	160 bar 400 bar	160 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 = 16.5 ... 42 V_{DC}
Option IS-version	2-wire: 4 ... 20 mA with HART® communication / V_S = 16.5 ... 28 V_{DC}
Error signal Namur NE43	high / low (adjustable)
Performance	
Accuracy	turn-down ≤ 10:1: ≤ ± 0.075 % FSO turn-down > 10:1: ≤ ± [0.0075 x turn-down] % FSO with turn-down = nominal pressure range / adjusted range *(FSO = Full Scale Output)*
Influence supply	≤ 0.001 % FSO / 10 V
Influence static pressure	type A: ± [0.015 mbar + 0.1 % of the adjusted range] / 40 bar type B: ± [0.06 mbar + 0.075 % of the adjusted range] / 160 bar type C: ± [0.2 mbar + 0.05 % of the adjusted range] / 160 bar type D: ± [1.25 mbar + 0.05 % of the adjusted range] / 160 bar type E: ± [10 mbar + 0.05 % of the adjusted range] / 160 bar
Influence installation position	max. 400 Pa (can be compensated by zero-point correction)
Long term stability	type A: ≤ ± (0.5 % x differential pressure range dp) / year at reference conditions type B: ≤ ± (0.2 % x differential pressure range dp) / year at reference conditions type C - E: ≤ ± (0.1 % x differential pressure range dp) / year at reference conditions
Permissible load	R_{max} = [(V_S – 16.5 V) / 0.023 A] Ω HART®-communication: R = 230 Ω ... 600 Ω
Response time	type A: approx. 1.6 sec type B: approx. 0.4 sec type C: approx. 0.2 sec type D: approx. 0.2 sec 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: ± [0.45 x turn-down + 0.25] % of the adjusted range] type B: ± [0.30 x turn-down + 0.20] % of the adjusted range] type C - E: ± [0.20 x turn-down + 0.10] % of the adjusted range]
Temperature range -40 … -20°C and +65 ... +100°C	type A: ± [0.45 x turn-down + 0.25] % of the adjusted range] type B: ± [0.30 x turn-down + 0.20] % of the adjusted range] type C - E: ± [0.20 x turn-down + 0.10] % of the adjusted range]
Permissible temperatures	
Environment / storage	without display: -40 ... 85 °C
	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.)
	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

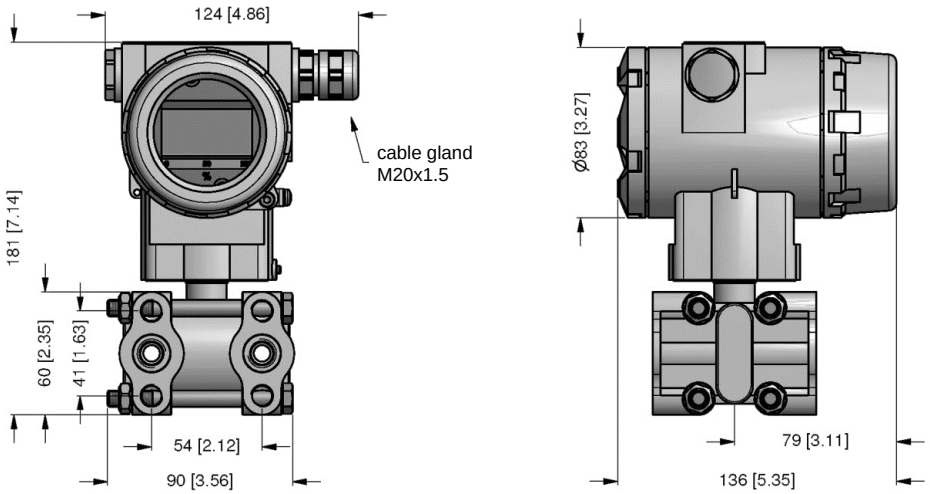
Materials	
Pressure port / flange	stainless steel 1.4401 (316) — others on request
Housing	standard: aluminium die cast with epoxy painting (blue) option: stainless steel 1.4301 (304) — others on request
Cable gland	aluminium die cast housing: PA grey (for cable-Ø 5 … 9 mm) stainless steel housing: stainless steel 1.4404 (316L) (for cable-Ø 7 … 12 mm) 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) options: EPDM (-40 … 125 °C) NBR (-40 … 125 °C) PTFE (-180 … 250 °C) — others on request
Diaphragm	standard: stainless steel 1.4435 (316L) option: Hastelloy® C-276 (2.4819) — others on request
Media wetted parts	pressure port, seal, diaphragm
Explosion protection – aluminium die cast housing	
Approval AX18-DPT200 intrinsically safe version	IBExU 14 ATEX 1273 X / IECEx IBE 16.0005X group II: II 1/2G Ex ia IIC T4 Ga/Gb / II 2D Ex ia IIIC T 85 °C Db safety technical maximum values: P_i = 660 mW, Ui = 28 V, I_i = 93 mA, C_i = 29.7 nF, L_i negligible permissible temperatures for environment: -40 ... 60 °C 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 group II: II 2G Ex db IIC T6 Gb permissible temperatures for environment: -40 ... 65 °C cable gland in brass; for cable-Ø 10 …14 mm
Explosion protection – stainless steel housing	
Approval AX18-DPT200 intrinsically safe version	IBExU 14 ATEX 1273 X / IECEx IBE 16.0005X group I (mines): I M1 Ex ia I Ma group II: II 1G Ex ia IIC T4 Ga / II 2D Ex ia IIIC T85°C Db safety technical maximum values: P_i = 660 mW, Ui = 28 V, I_i = 93 mA, C_i = 29.7 nF, L_i negligible permissible temperatures for environment: -40 ... 60 °C cable gland in stainless steel 1.4404 (316L); for cable-Ø 7 … 12 mm
Miscellaneous	
Display (optionally)	type: LCD, lines: 2, digits: 8, bargraph: 0…100%, rotatability: 90°-steps and / or by turn of display module
Configuration	- offset / span local via 2 buttons - local configuration with an optional display - complete configuration via HART®
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
Wiring diagram	



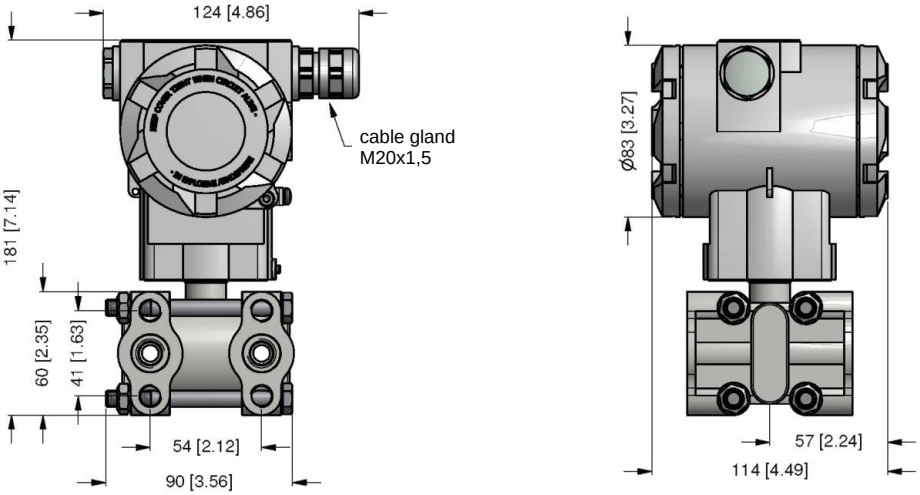
Pin configuration	
Electrical connection	terminal clamps (for cable-Ø max. 2.5 mm²)
Supply + (V_s +) Supply / Test – (V_s –) Test +	+ - TEST +
Ground	⏚

Dimensions (mm / in)

DPT 200 with display

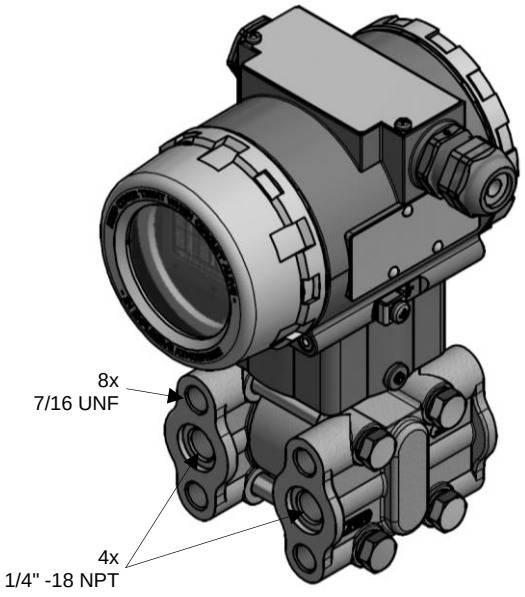


DPT 200 without display

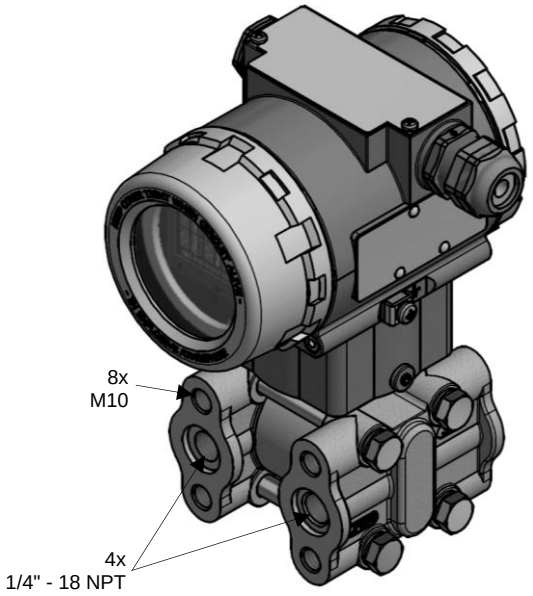


Process connections

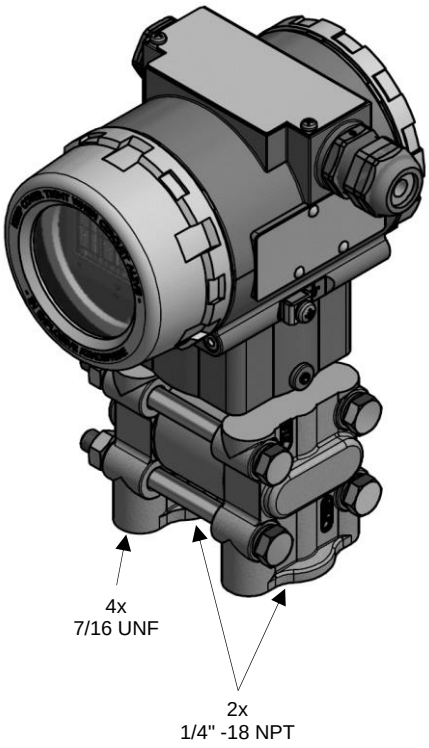
code N20 / N25
1/4" - 18 NPT / fixing 7/16 UNF



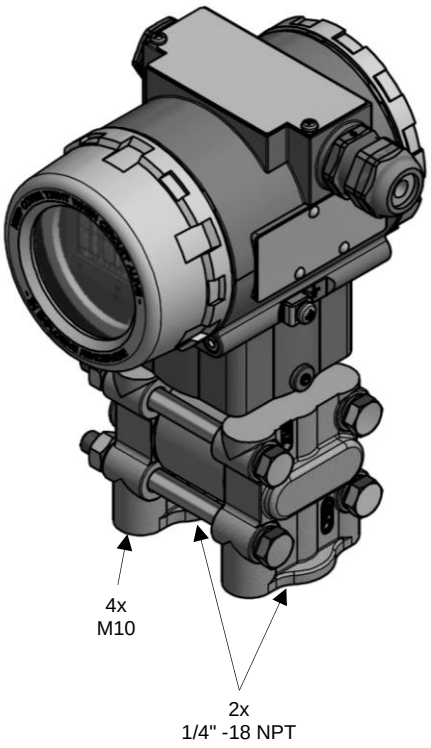
code N30
1/4" - 18 NPT / fixing M10



code N21
1/4" - 18 NPT vertical / fixing 7/16 UNF



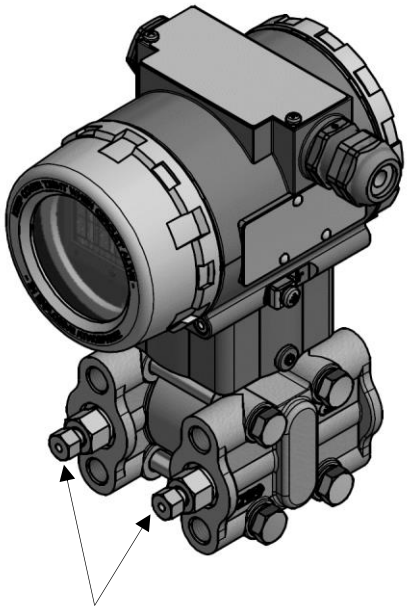
code N31
1/4" - 18 NPT vertical / fixing M10



⇨ **In scope of delivery two locking screws 1/4" - 18 NPT are included as standard.**

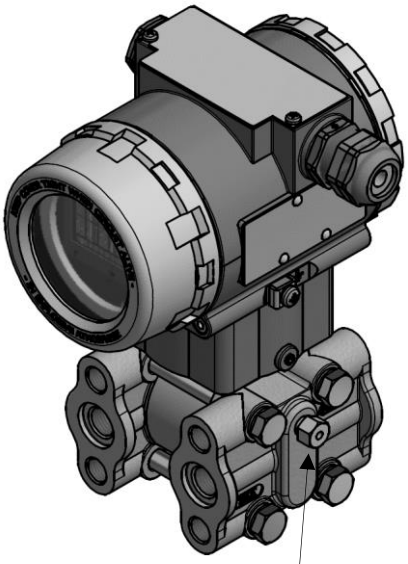
Valves (optionally)

code 1



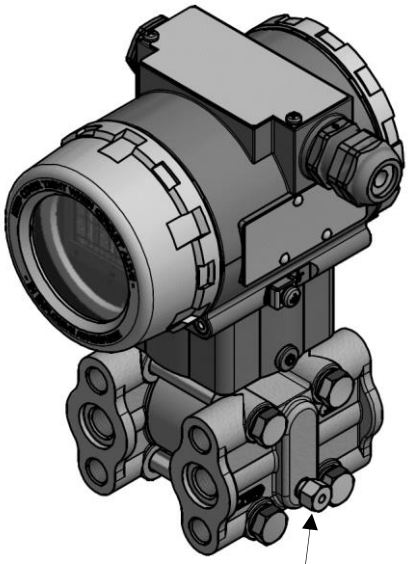
vent position:
straight (2x)

code 2



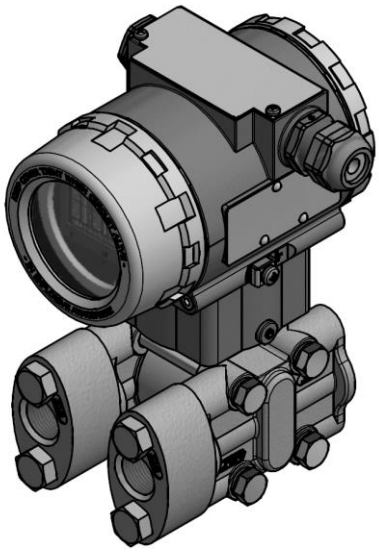
vent position:
top (2x)

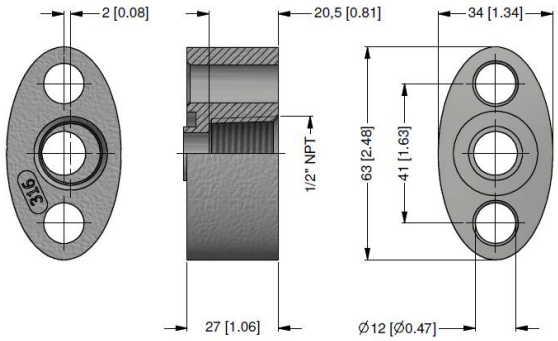
code 3



vent position:
bottom (2x)

Oval flange adapter 1/2" NPT female

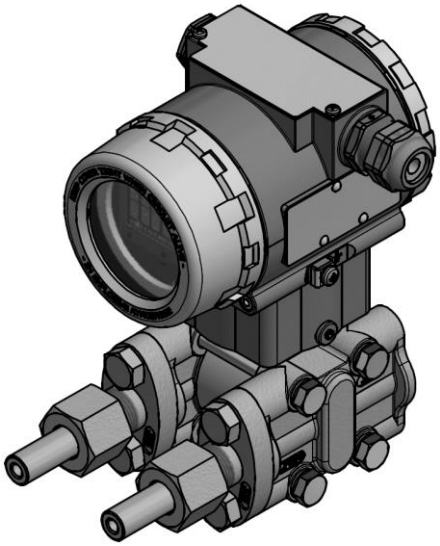


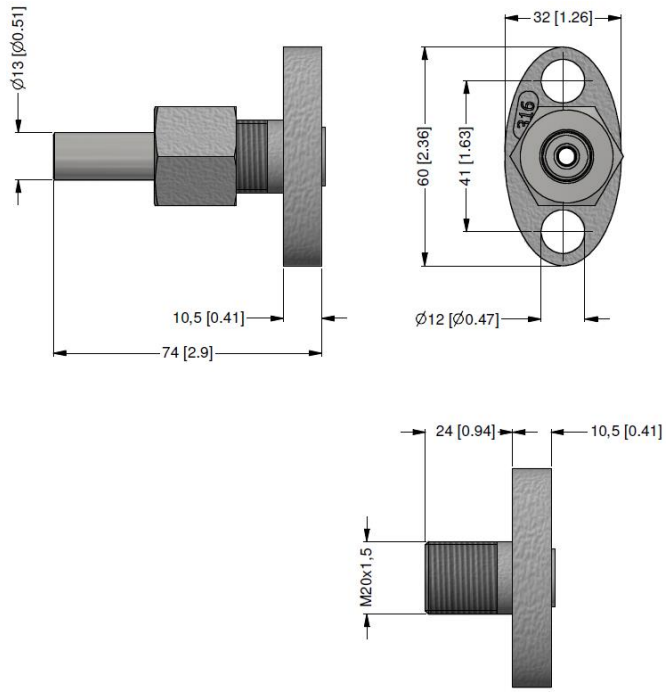


Technical data	
Material of adapter	stainless steel 1.4401 (316)
Weight	approx. 300 g
Scope of delivery	two adapter, four locking screws 7/16 UNF x 1 3/4" A2

Ordering type	Ordering code
Oval flange adapter with 1/2" NPT female	Z1004181

Oval flange adapter M20x1.5 male with tube Ø 13 mm (optionally with volume reduced flange - code N25)

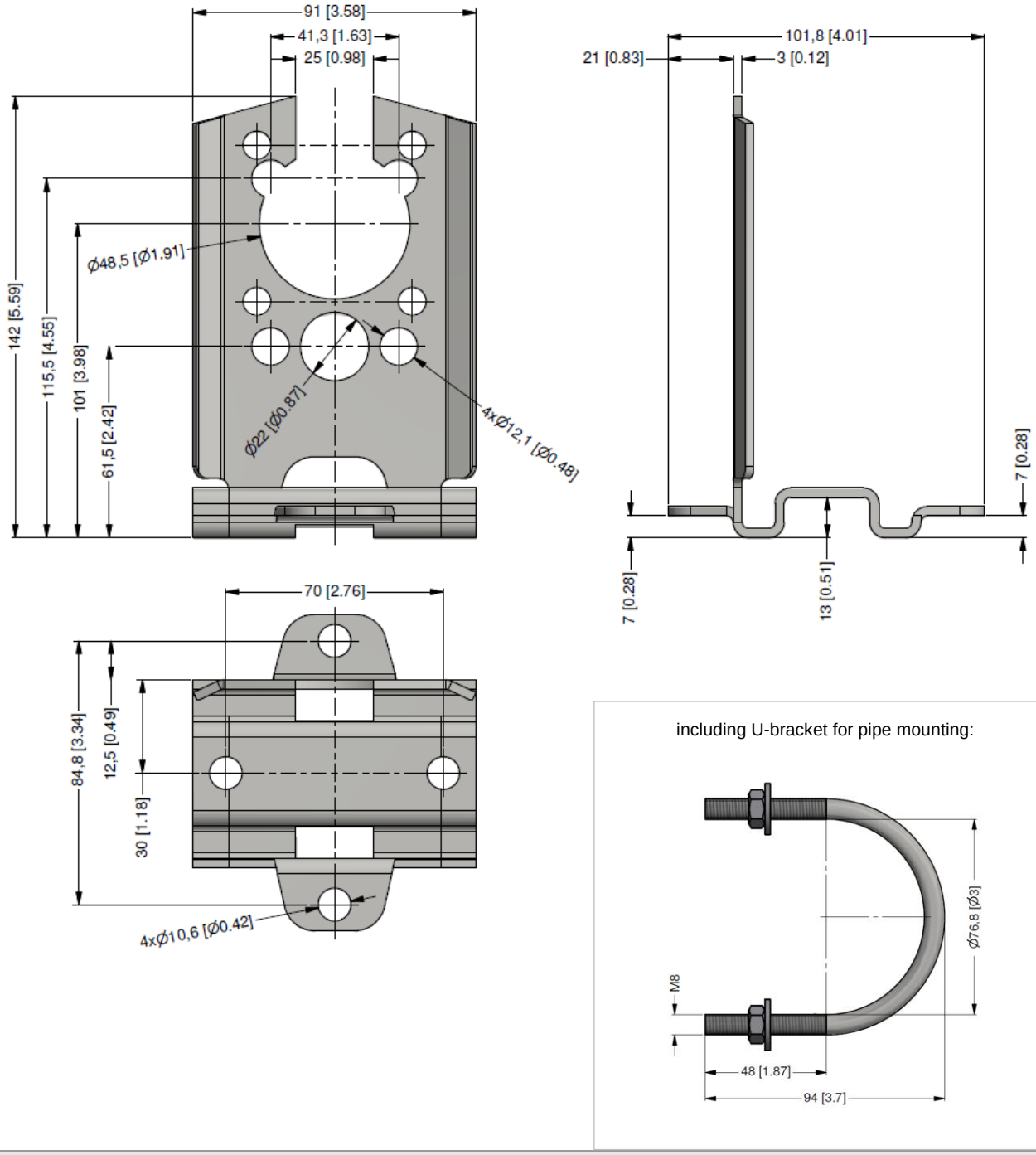




Technical data	
Material of adapter / tube	stainless steel 1.4401 (316)
Weight	approx. 250 g
Scope of delivery	two adapter, four locking screws 7/16 UNF x 1" A2

Ordering type	Ordering code
Oval flange adapter M20x1.5 male with tube	Z1004182

Mounting bracket

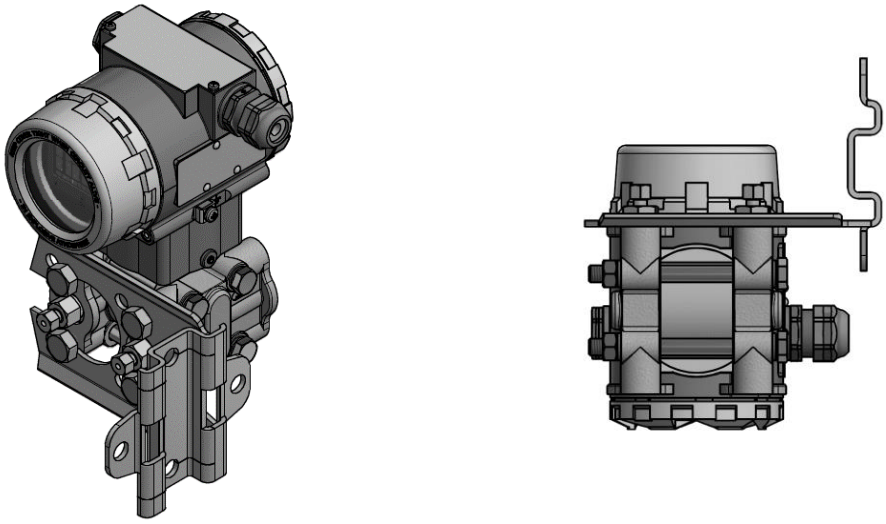


Technical data	
Material of mounting bracket	stainless steel 1.4301 (304)
Weight	approx. 500 g
Scope of delivery	mounting bracket, four locking screws 7/16 UNF x 1 3/4" A2, U-bracket for pipe mounting with two nuts

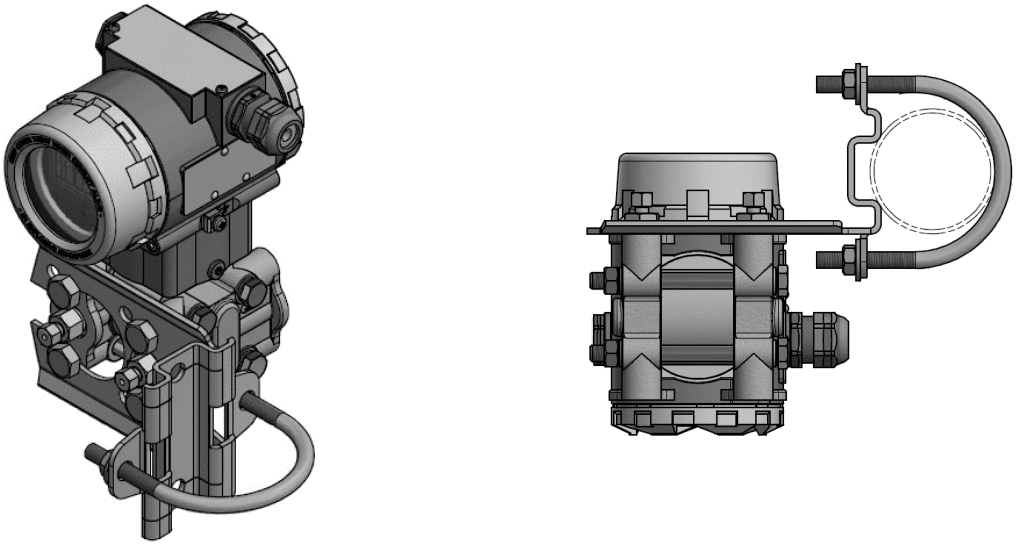
Ordering type	Ordering code
Mounting bracket	Z1004179

Mounting variants for mounting bracket

wall mounting



pipe mounting



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

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BD|SENSORS pressure measurement

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Ordering code DPT 200

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Pressure		
differential pressure	3 4 3	
Input [bar]		
type A: 0 ... 1 mbar up to 0 … 10 mbar	A	
type B: 0 … 2 mbar up to 0 … 60 mbar	B	
type C: 0 … 4 mbar up to 0 … 400 mbar	C	
type D: 0 … 25 mbar up to 0 … 2.5 bar	D	
type E: 0 … 200 mbar up to 0 … 20 bar	E	
customer	9	consult
Maximun static pressure		
70 bar (only type A)	7	
160 bar (type B - E)	1	
400 bar (type C - E)	4	
Output		
4 … 20 mA / 2-wire with HART®-communication	H	
group II Ex ia 4 … 20 mA / 2-wire with HART®-communication	I	
group II Ex d 4 … 20 mA / 2-wire with HART®-communication [1]	G	
group I Ex ia 4 … 20 mA / 2-wire with HART®-communication (mines) [2]	FH	
customer	9	consult
Accuracy		
0.075 %	1 7	
Housing		
aluminium	L	
stainless steel 1.4301 (304)	2	
Display		
without display	A N	
with backlight display	A L	
Electrical connection		
terminals / cable gland M20x1.5	A K 0	
customer	9 9 9	consult
Process connection H-side / L-side (identical)		
1/4" - 18 NPT / fixing 7/16 UNF	N 2 0 - N 2 0	
1/4" - 18 NPT / fixing M10	N 3 0 - N 3 0	
1/4" - 18 NPT, vertical / fixing 7/16 UNF	N 2 1 - N 2 1	
1/4" - 18 NPT, vertical / fixing M10	N 3 1 - N 3 1	
1/4" - 18 NPT / fixing 7/16 UNF with volume reduced flange	N 2 5 - N 2 5	
customer	9 9 9 - 9 9 9	consult
Valve H-side / L-side (identical)		
without	0 - 0	
with vent (straight)	1 - 1	
with vent (top) [3]	2 - 2	
with vent (bottom) [3]	3 - 3	
Material flange, valves		
stainless steel 1.4401 (316)	1 2	
Diaphragm / filling fluid		
stainless steel 1.4435 (316L) / silicone oil	1 1	
Hastelloy® C-276 (2.4819) / silicone oil	H 1	
customer	9 9	consult
Seals		
FKM	1	
EPDM	3	
NBR	5	
PTFE	4	
customer	9	consult
Special version		
standard	0 0 0	
customer	9 9 9	consult

Accessories	
oval flange adapter 1/2" NPT female	Z1004181
optionally with N25: oval flange adapter M20x1.5 male with tube	Z1004182
mounting bracket in stainless steel 1.4301 (304)	Z1004179

[1] only in combination with aluminium housing
[2] only in combination with stainless steel housing
[3] only in combination with process connection code N20 or N30

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

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