DPT 100

Differential Pressure Transmitter for Process Industry

accuracy according to IEC 60770:
0.1 % FSO

Differential pressure

from 10 mbar up to 20 bar

Static pressure

max. 400 bar

Output signal

2-wire: 4 ... 20 mA

RS485 with Modbus RTU protocol

Special characteristics

- compact design
- fast response time
- aluminium die cast case
- zero adjustment via button

Optional versions

- several process connections

The differential pressure transmitter DPT 100 has been especially designed for fast test processes in leakage and flow measurement, where a fast response time and high sampling rate are necessary.

The compact design of the DPT 100 facilitates the usage in standardised applications. For instance, the installation in 19" racks.

The DPT 100 with optionally RS485 interface uses the communication protocol Modbus RTU which has found the way in industrial communication as an open protocol. The Modbus protocol is based on a master Slave architecture with which up to 247 Slaves can be questioned by a master – the data will transfer in binary form.

Preferred areas of use are

Test engineering / leak testing

Machine and plant engineering

Environmental technology

Energy production

BD SENSORS GmbH
BD-Sensors-Straße 1
D - 95199 Thierstein

Tel.: +49 (0) 92 35 / 98 11- 0
Fax: +49 (0) 92 35 / 98 11- 11

www.bdsensors.de
info@bdsensors.de

Differential pressure ranges						
Pressure range p_N diff.	10 mbar	60 mbar	100 mbar	400 mbar	2.5 bar	20 bar
Pressure range p_N symmetric (diff.)	± 10 mbar	± 60 mbar	± 100 mbar	± 400 mbar	on request	on request
Permissible static pressure	70 bar	400 bar	400 bar	400 bar	400 bar	400 bar

Output signal / Supply					
Standard	2 wire : 4 ... 20 mA / V_S = 12 ... 32 V_{DC}				
Option	digital: RS 485 with Modbus RTU protocol / V_S = 9 … 32 V_{DC} (delay time: 500 msec)				
Performance					
Accuracy [1]	$p_N \geq 60$ mbar: ≤ ± 0.1 % FSO $p_N < 60$ mbar: ≤ ± 0.2 % FSO				
Permissible load	$R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$				
Influence supply	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ				
Influence static pressure p_N [Pa/100 bar]	10 mbar 18	60 mbar 30	400 mbar 40	2.5 bar 250	20 bar 2000
Influence installation position	max. 400 Pa (can be compensated by zero-point correction) **for ranges < 60 mbar please state installation position on the order**				
Long term stability	$p_N \geq 60$ mbar: ≤ ± 0.05 %FSO/ year at reference conditions $p_N < 60$ mbar: ≤ ± 0.15 %FSO/ year at reference conditions				
Sampling rate	250 Hz				
Turn-on time	approx. 260 msec				
Response time (10 … 90 %)	10 msec				
[1] *accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)*					
Thermal effects (offset and span)					
Thermal error	≤ ± 0.1 % FSO / 10 K				
Compensated range	-20 ... 80 °C				
Permissible temperatures					
Medium	-25 … 85°C				
Electronics / environment	-25 … 85°C				
Storage	-25 … 85°C				
Electrical protection					
Short-circuit protection	permanent				
Reverse polarity protection	no damage, but also no function				
Electromagnetic compatibility	emission and immunity according to EN 61326				
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		
Materials					
Pressure port / flange	stainless steel 1.4401 (316)				others on request
Diaphragm	stainless steel 1.4404 (316L)				others on request
Vent and dump valves, blanking plugs	stainless steel 1.4401 (316)				
Bolts and nuts	steel, zinc flake coated				others on request
Housing	aluminium die cast with epoxy painting (grey)				others on request
Cable gland	polyamide				
Seals (media wetted)	standard: FKM options: EPDM, NBR				others on request
Filling fluids	silicone oil				others on request
Media wetted parts	pressure port, seal of pressure port, diaphragm				

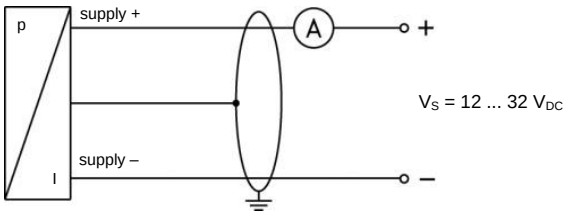
Miscellaneous	
Mounting bracket (optionally)	material C-steel or stainless steel 1.4401 (304) weight 0.45 kg (incl. bolts and nuts)
Ingress protection	IP 66 / IP 67
Installation position	any [2]
Weight	approx. 1800 g
Current consumption	approx. 23 mA
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) [3]

[2] Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point. Press the button for zero adjustment (see operating manual).
[3] This directive is only valid for devices with maximum permissible overpressure > 200 bar.

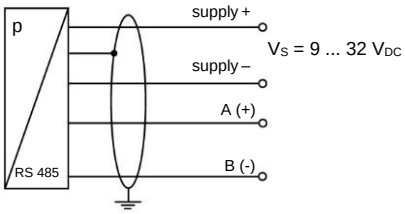
Connections	
Electrical connection	terminal clamps in clamping chamber (for cable-Ø max.2.5 mm²)
Process connections	
Standard	internal thread 1/4" - 18 NPT / fixing 7/16 UNF
option	internal thread 1/4" - 18 NPT / fixing M10 others: on request

Wiring diagram

2-wire-system (current)



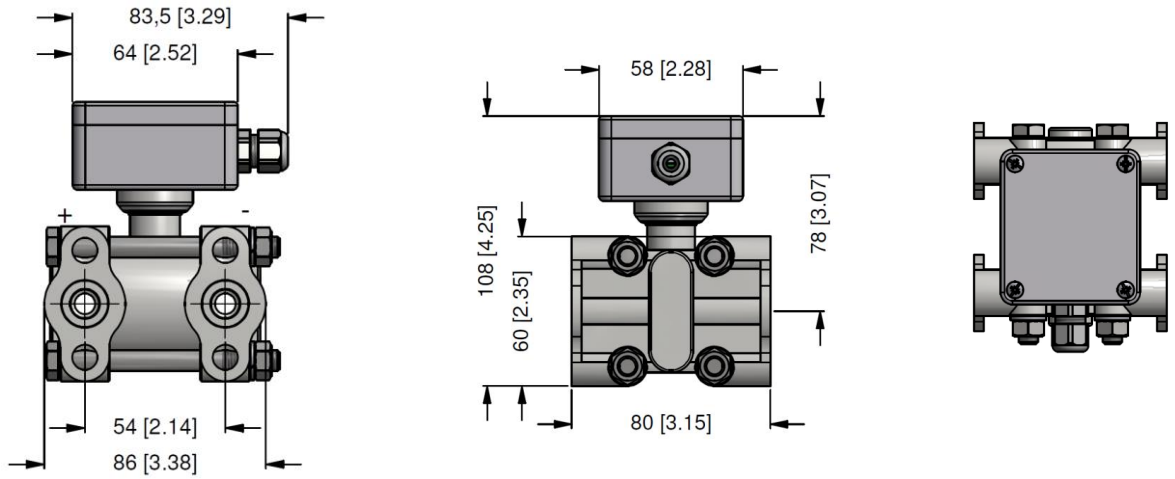
RS485 / Modbus RTU



Pin configuration

Electrical connection	terminal clamps	M12x1 / metal (4-pin)
Supply +	+ Ub	1
Supply –	- Ub	3
for RS485 / Modbus RTU:		
A (+)	A	2
B (–)	B	4
Ground	⏚	plug housing

Dimensions (mm / in)



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Ordering code DPT 100

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Pressure			
	differential pressure	3 4 5	
Input			
	10 mbar	0 1 0 0	
	60 mbar	0 6 0 0	
	100 mbar	1 0 0 0	
	400 mbar	4 0 0 0	
	2.5 bar	2 5 0 1	
	20 bar	2 0 0 2	
	-10 … 10 mbar	S 0 1 0	
	-60 … 60 mbar	S 0 6 0	
	-100 … 100 mbar	S 1 0 0	
	-400 … 400 mbar	S 4 0 0	
	customer	9 9 9 9	consult
Output			
	4 … 20 mA / 2-wire	1	
	RS485 Modbus RTU	L5	
	customer	9	consult
Accuracy			
$p_N \geq$ 60 mbar:	0.1 % FSO	1	
$p_N <$ 60 mbar:	0.2 % FSO	B	
	customer	9	consult
Housing			
	aluminium	L	
	customer	9	consult
Electrical connection			
	terminals / cable gland M12x1.5	A K 2	
	male plug M12x1 (4-pin) / metal	M 1 7	
	customer	9 9 9	consult
Process connection			
	1/4" - 18 NPT F / fixing 7/16 UNF	N 2 0	
	1/4" - 18 NPT (F / vertical) / fixing 7/16 UNF	N 2 1	
	1/4" - 18 NPT F / fixing M10	N 3 0	
	1/4" - 18 NPT (F / vertical) / fixing M10	N 3 1	
	customer	9 9 9	consult
Valve			
	without	0	
	with vent	1	
	with vent (top)	2	
	with vent (bottom)	3	
Material pressure port, flange, valves, etc.			
	stainless steel 1.4401 (316 SS)	1 2	
	customer	9 9	consult
Diaphragm / filling fluid			
	stainless steel 1.4435 (316L) / silicone oil	1 1	
	customer	9 9	consult
Seal			
	FKM	1	
	EPDM	3	
	NBR	5	
	PTFE	4	
	customer	9	consult
Special version			
	standard	0 0 0	
	customer	9 9 9	consult

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