

DMP 331Pi

Precision Pressure Transmitter

pressure ports and
process connections with
flush welded stainless steel diaphragm

accuracy according to EN IEC 62828-2:
0.1 % span



Nominal pressure

from 0 ... 400 mbar up to 0 ... 40 bar

Output signals

2-wire: 4 ... 20 mA

3-wire: 0 ... 10 V

others on request

Product characteristics

- ▶ excellent temperature response
0.04 % span / 10K
- ▶ turn-down 10:1
- ▶ processing of the sensor signal using
digital electronics
- ▶ process connections suitable for hy-
gienic application
- ▶ vacuum resistant

Optional versions

- ▶ IS-version (on request)
Ex ia = intrinsically safe for gases and
dusts
- ▶ communication interface for adjustment
of offset, span and damping

The precision pressure transmitter DMP 331Pi demonstrates the further development of well-trying industrial pressure transmitter DMP 331P.

The signal from the specially designed piezoresistive stainless steel sensor is processed by the newly developed digital electronic system, performing thus an active compensation of sensor-specific deviations such as hysteresis, thermal errors and non-linearity.

The temperature range of -40 ... 125 °C can be extended by the integration of a cooling element up to 300 °C.

Preferred areas of use are



Laboratory techniques



Food and beverage



Pharmaceutical industry

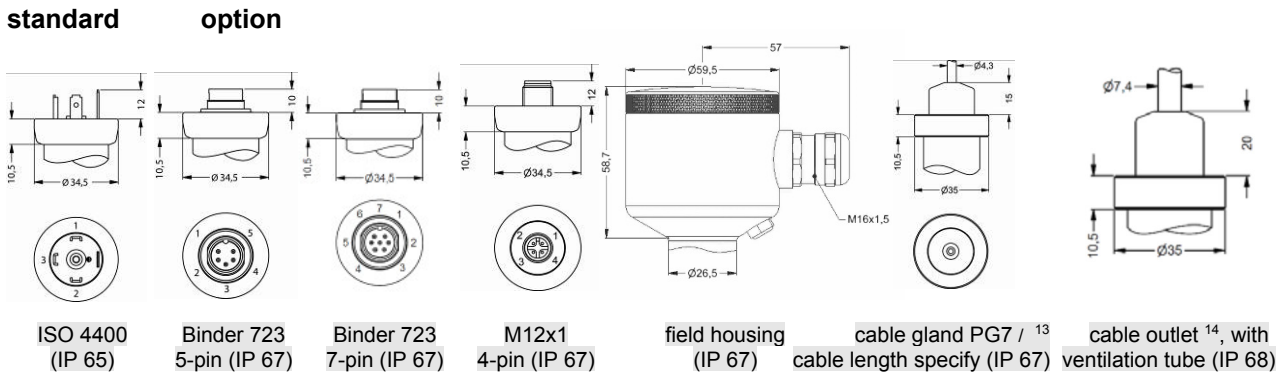


74-06

Pressure ranges ¹								
Nominal pressure gauge / absolute ²	[bar]	0.4	1	2	4	10	20	40
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure ≥	[bar]	3	7,5	15	25	50	120	210
Vacuum resistance		P _N ≥ 1 bar: unlimited vacuum resistance P _N < 1 bar: on request						
¹ On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.								
² absolut pressure permissible from 1 bar								
Vacuum ranges								
Nominal pressure *	[bar]	-0.4 ... 0.4	-1 ... 1	-1 ... 2	-1 ... 4	-1 ... 10		
Overpressure	[bar]	2	5	10	20	40		
Burst pressure ≥	[bar]	3	7.5	15	25	50		
[*] for 0 ... 1 bar abs. or -1 ... 0 bar gauge max.temperature 70°C								
Output signal / Supply								
Standard		2-wire: 4 ... 20 mA / V _S = 12 ... 36 V _{DC}						
Option IS-protection		2-wire: 4 ... 20 mA / V _S = 14 ... 28 V _{DC}						
Options		2-wire: 4 ... 20 mA with communication interface ³ 3-wire: 0 ... 10 V / V _S = 14 ... 36 V _{DC} 0 ... 10 V with communication interface ³						
³ only possible with el. connection Binder series 723 (7-pin)								
Performance								
Accuracy ⁴ performance after turn-down - TD ≤ 5:1 - TD > 5:1		IEC 60770: ≤ ± 0.1 % span no change of accuracy ⁵ for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 5): ≤ ± [0.1 + 0.015 x turn-down] % span with turn-down = nominal pressure range / adjusted range e.g. with a turn-down of 10:1 following accuracy is calculated: ≤ ± (0.1 + 0.015 x 10) % span i.e. accuracy is ≤ ± 0.25 % span						
Permissible load		current 2-wire: R _{max} = [(V _S - V _S min) / 0.02 A] Ω voltage 3-wire: R _{min} = 10 kΩ						
Influence effects		supply: 0.05 % span / 10 V load: 0.05 % span / kΩ						
Long term stability		≤ ± (0.1 x turn-down) % span / year						
Response time		current 2-wire: approx 5ms voltage 3-wire: 25 ms						
Adjustability		configuration of following parameters possible (interface / software necessary ⁶): - electronic damping: 0 ... 100 sec - offset: 0 ... 90 % span - turn down of span: max. 10:1						
⁴ accuracy according to EN IEC 62828-2- limit point adjustment (non-linearity, hysteresis, repeatability)								
⁵ except nominal pressure ranges □ ≤ 0.40 bar; for these calculation of accuracy is as follows: ≤ ± (0.1 + 0.02 x turn-down) % span e.g. turn-down of 3:1: ≤ ± (0.1 + 0.02 x 3) % span i.e. accuracy is ≤ ± 0.16 % span								
⁶ software, interface, and cable have to be ordered separately (software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or higher, and XP)								
Thermal effects ⁷ (Offset and Span) / Permissible temperatures								
Tolerance band [% span]		≤ ± (0.35 x turn-down) in compensated range 0 ... 80 °C						
TC, average [% span / 10 K]		≤ ± (0.035 x turn-down) in compensated range 0 ... 80 °C						
Permissible temperatures		medium ⁸ : -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food compatible oil electronics / environment: -25 ... 85 °C storage: -40 ... 100 °C						
Permissible temperature medium for cooling element ⁹		filling fluid silicon oil overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C ¹⁰		filling fluid food compatible oil overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C ¹⁰				
⁷ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.								
⁸ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C								
⁹ max. temperature depends on the used sealing material, type of seal and installation								
¹⁰ also for P _{abs} ≤ 1 bar								
Electrical protection								
Short-circuit protection		permanent						
Reverse polarity protection		no damage, but also no function						
Electromagnetic compatibility		emission and immunity according to EN 61326						
Filling fluids								
Standard		silicon oil						
Options		food compatible oil with FDA approval (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request						
Mechanical stability								
Vibration (DIN EN 60068-2-6)		G 1/2": 20 g RMS (25 ... 2000 Hz);			others except G 1/2": 10 g RMS (25 ... 2000 Hz)			
Shock (DIN EN 60068-2-27)		G 1/2": 500 g / 1 msec;			others except G 1/2": 100 g / 1 msec			

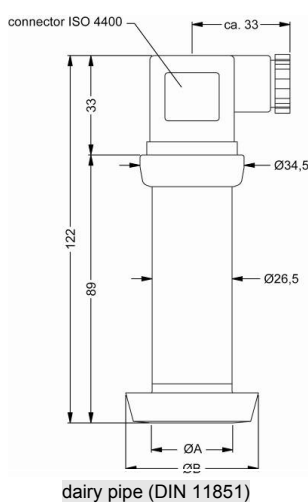
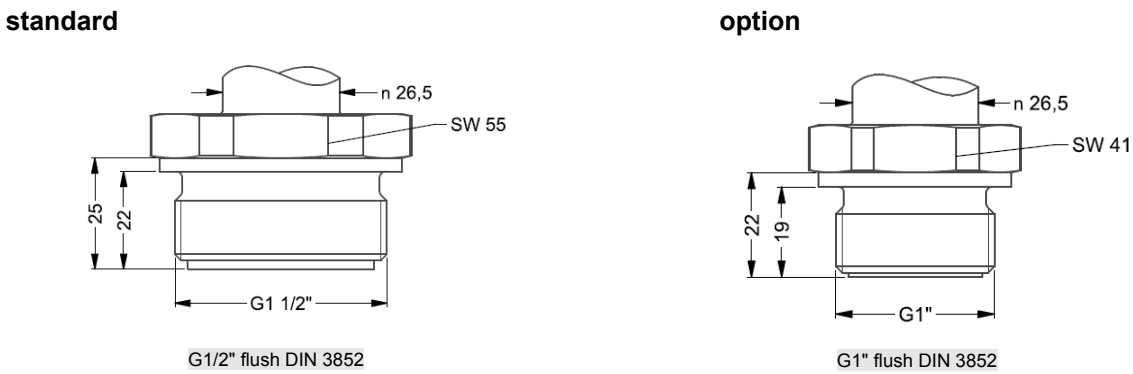
Materials						
Pressure port	stainless steel 1.4404 (316 L) others on request					
Housing	stainless steel 1.4404 (316 L)					
Option field housing	stainless steel 1.4301 (304), cable gland M16x 1.5 brass, nickel plated (clamping range 2...8 mm)					
Seals (O-ring)	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) others on request clamp and dairy pipe: without					
Diaphragm	standard: stainless steel 1.4435 (316L) option: Hastelloy® C-276 (2.4819) and Tantalum on request					
Media wetted parts	pressure port, diaphragm					
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approvals	IBExU10ATEX1122 X					
DX9-DMP 331Pi	zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIC T135°C Da					
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C_i \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$, the supply connections have an inner capacity of max. 27 nF to the housing					
Ambient temperature range	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar in zone 1 or higher: -20 ... 65 °C					
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 $\mu\text{H}/\text{m}$					
Miscellaneous						
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA					
EHEDG certificate Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. - Varivent (P41): EPDM-O-ring which is FDA-listed - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH					
Surface roughness	pressure port $R_a < 0.8 \text{ }\mu\text{m}$ (media wetted parts) diaphragm $R_a < 0.15 \text{ }\mu\text{m}$ weld seam $R_a < 0.8 \text{ }\mu\text{m}$					
Weight	approx. 200 g					
Installation position	any ¹¹					
Operational life	100 million load cycles					
CE-conformity	EMC Directive: 2014/30/EU					
ATEX Directive	2014/34/EU					
¹¹ 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 for pressure ranges $P_N \leq 1 \text{ bar}$.						
Wiring diagrams						
<p>2-wire-system (current)</p>	<p>3-wire-system (voltage)</p>					
Pin configuration						
Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723/423 (7-pin)	M12x1/ metal (4-pin)	field housing	cable colours (IEC 60757)
Supply +	1	3	3	1	IN +	wh (white)
Supply -	2	4	1	2	IN -	bn (brown)
Signal + (only for 3-wire)	3	1	6	3	OUT +	gr (green)
shield	ground pin \oplus	5	2	4	\oplus	ye/gn yellow / green
Communication interface ¹²	RxD	-	4	-	-	-
	TxD	-	5	-	-	-
	GND	-	7	-	-	-
¹² may not be connected directly with the PC (the suitable adapter is available as accessory)						

Electrical connections (dimensions in mm)

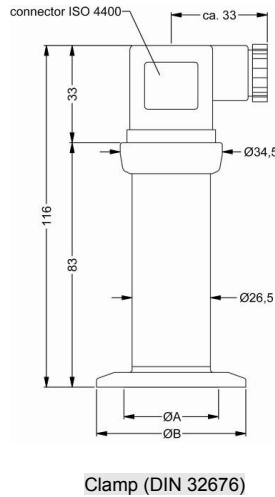


¹³ standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)
¹⁴ different cable types and lengths available, permissible temperature depends on kind of cable

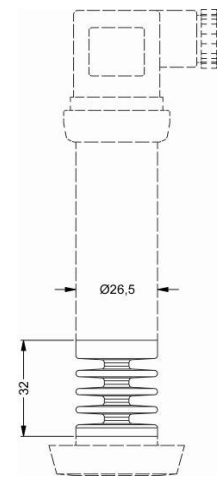
Mechanical connection (dimensions in mm)



dimensions in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68.5
P _N [bar]	≤ 40	≤ 40	≤ 25



dimensions in mm			
size	DN 25	DN 32	DN 50
A	23	32	45
B	50.5	50.5	64
P _N [bar]	≤ 16	≤ 16	≤ 16



⇒ metric threads and others on request

Windows® is a registered trade mark of Microsoft Corporation

⁹ max. temperature depends on the used sealing material, type of seal and installation

This datasheet contains product specification. Properties are not guaranteed. Subject to change without notice.

Ordering code DMP 331Pi

29.6.2021

DMP 331Pi

- - - - - - - -

Pressure										
Gauge	5	0	0							
Absolute ¹	5	0	1							
Input [bar]										
0 ... 0,4 ¹				4	0	0	0			
0 ... 1				1	0	0	1			
0 ... 2				2	0	0	1			
0 ... 4				4	0	0	1			
0 ... 10				1	0	0	2			
0 ... 20				2	0	0	2			
0 ... 40				4	0	0	2			
-0,4... 0,4				S	4	0	0			
-1 ... 0 (temperature max. 70°C)				X	1	0	2			
-1 ... 1 (temperature max. 70°C)				S	1	0	2			
-1 ... 2 (temperature max. 70°C)				V	2	0	2			
-1 ... 4 (temperature max. 70°C)				V	4	0	2			
-1 ... 10 (temperature max. 70°C)				V	1	0	3			
Customer				9	9	9				
Customer - underpressure (temperature max. 70°C)				X	X	X	X			
Output										
4...20 mA / 2-wire								1		
0 ... 10 V / 3-wire								3		
Intrinsic safety Ex ia 4 ... 20 mA / 2-wire								E		
Customer								9		
Accuracy										
0,1 % - standard range								1		
0,1 % - standard range including Calibration Certificate								P		
0,1 % - customer range								I		
0,1 % - customer range including Calibration Certificate								H		
0,2 % (P _N < 0,1 bar)								B		
Customer								9		
Electrical connection										
Connector DIN 43650 (ISO 4400) (IP 65)								1	0	0
Connector Binder 723 5-pin (IP 67)								2	0	0
Cable gland PG7 / cable length specify (IP 67)								4	0	0
+ PVC cable / 1 m										
Connector Buccaneer (IP 68)								5	0	0
Field housing stainless steel, cable gland M 16 x 1,5 (IP 67)								8	0	0
Field housing stainless steel, cable gland M 20 x 1,5 (IP 67)								8	8	0
Connector Binder 723 and 423 7-pin (IP 67) (for RS 232)								A	0	0
Connector DIN 43650 (ISO 4400) - Potting compound inside (IP 67)								E	0	0
Connector M12 x 1, 4-pin (IP 67)								M	0	0
Connector M12 x 1, 4-pin (IP 67) - metal								M	1	0
Cable outlet, cable with ventilation tube (IP68) ²								T	R	0
+ PVC cable / 1 m										
Customer								9	9	9
Mechanical connection										
G 1/2" DIN 3852 (P _N > 2,5 bar) (only with seals) ⁴								Z	0	0
M 20 x 1,5 DIN 3852 (P _N > 2,5 bar) (only with seals)								D	0	4
G 3/4" DIN 3852 (P _N > 0,6 bar) (only with seals)								Z	3	0
G 1" DIN 3852 (P _N > 0,25 bar) (only with seals)								Z	3	1
G 1 1/2" DIN 3852 (only with seals)								Z	3	3
G 2" DIN 3852								Z	3	4
G 1" DIN 3852 flush 2x O ring (P _N > 0,25 bar)								Z	5	7
G 1/2" DIN 3852 flush 2x O ring (P _N > 1 bar)								Z	6	1
G 3/4" DIN 3852 flush 2x O ring (P _N > 1 bar)								Z	6	6
1/8" - 27 NPT (without seals, monel pressure port, tantal membrane)								Z	9	2
G1" cone seal (without seals)								K	3	1
Clamp DN 3/4" (4 bar < P _N < 8 bar) (without seals)								C	6	8
Clamp DN 1" (DN 25) (0,4 bar < P _N < 16 bar) (without seals)								C	6	1
Clamp DN 1 1/2" (DN 32) (0,4 bar < P _N < 16 bar) (without seals)								C	6	2
Clamp DN 2" (DN 50) (0,4 bar < P _N < 16 bar) (without seals)								C	6	3
DIN 11851 DN 25 (P _N > 0,6 bar) (without seals) ³								M	7	3
DIN 11851 DN 40 (P _N > 0,4 bar) (without seals) ³								M	7	5
DIN 11851 DN 50 (P _N > 0,25 bar) (without seals) ³								M	7	6
"sandwich" DN 25 (without seals)								S	6	1



BD SENSORS s.r.o.
Hradištská 817
CZ – 687 08 Buchlovice

Tel.: +420 572 411 011
Fax: +420 572 411 497

www.bdsensors.cz
info@bdsensors.cz



The company BD SENSORS s.r.o. is certified by TÜV SÜD Czech according to the standard ISO 9001.

"sandwich" DN 50 (without seals)	S 7 6					
"sandwich" DIN 2501 DN 80 (without seals)	S 8 0					
M 22 x 1,5 DIN 3852 (P _N > 2,5 bar) (only with seals)	D 1 5					
Flange DN 25/PN 40 DIN 2501 (without seals)	F 2 0					
Flange DN 40/PN 40 DIN 2501 (without seals)	F 2 2					
Flange DN 50/PN 40 DIN 2501 (without seals)	F 2 3					
Flange DN 80/PN 16 DIN 2501 (without seals)	F 1 4					
Flange DN 100/PN 16 DIN 2501 (without seals)	F 2 5					
Varivent® DN 40/50 (without seals)	P 4 1					
Customer	9 9 9					
Diaphragm						
Stainless steel 1.4435 (316 L)		1				
Hastelloy® C-276		H				
Tantalum		T				
Customer		9				
Seals						
Without seals (Clamp, dairy pipe DIN, sandwich, flange, varivent)		0				
Viton (FKM)		1				
FFKM		7				
EPDM		3				
Customer		9				
Filling Fluids						
Silicone oil			1			
Edible oil for foodstuff industry (temperature max. 150°C)			2			
Halocarbon			C			
Customer			9			
Special version						
Standard				1	1	1
Communication RS 232 ⁵				1	2	1
With cooling element for temp. up to 150°C				1	6	1
With cooling element for temp. up to 300°C (P _N ≤ 70 bar max. 200°C permanent)				2	1	1
Communication RS 232 with cooling element (up to 300°C P _N ≤ 70 bar max. 200°C) ⁵				2	2	1
Customer				9	9	9
3.1 Material Certificate for Membrane and Mechanical Connection						
Settings in temperature different from basic 20°C (+/-10°C, max. 70 bar and 200°C)						3.1 prot.

0,-...without additional charge

On request...in accordance with the producer

!!! When you make an order it is necessary to fill the questionnaire for transmitter with separators!!!

Surcharges for calibration are not subject to any discounts. Subject to change.

This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet.

BD SENSORS reserves the right to change sensor specifications without further notice.

1 absolut pressure possible from 1 bar

2 cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

3 The cup nut has to be mounted by production of pressure transmitter with electrical connection field housing and mechanical connection dairy pipe.

The cup nut has to be ordered as separate position.

4 possible only for P_N ≥ 1 bar

5 RS-232 interface only possible with el. connection Binder series 723/423 (7-pin)

Software, Interface and cable for DMP 331 Pi with option RS-232 have to be order separately

(Ordering code: CIS-G; Software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or newer and XP)



BD SENSORS s.r.o.
Hradištská 817
CZ – 687 08 Buchlovice

Tel.: +420 572 411 011
Fax: +420 572 411 497

www.bdsensors.cz
info@bdsensors.cz

The company BD SENSORS s.r.o. is certified by TÜV SÜD Czech according to the standard ISO 9001.

