

DMP 331P

Industrial Pressure Transmitter

Process Connections With
Flush Welded Stainless Steel
Diaphragm

accuracy according to EN IEC 62828-2:
standard: 0.35 % span
option: 0.25 % span



Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Output signals

2-wire: 4 ... 20 mA / 3-wire: 0 ... 10 V
others on request

Special characteristics

- ▶ hygienic version
- ▶ CIP / SIP cleaning up to 150 °C
- ▶ vacuum resistant

Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gases and dust
- ▶ SIL 2
according to IEC 61508 / IEC 61511
- ▶ Diaphragm in
Hastelloy[®] or Tantalum
- ▶ cooling element for media
temperatures up to 300 °C

The pressure transmitter DMP 331P was designed for use in the food / beverage and pharmaceutical industry. The compact design with hygienic versions makes it possible to achieve an outstanding performance in terms of accuracy, temperature behavior and long term stability.

The modular construction concept allows a combination of various process connections with different filling fluids and a cooling element. Several electrical connections complete the profile of DMP 331P.

Preferred areas of use are



Food and Beverage



Pharmaceutical Industry

Material and test certificates

inspection certificate 3.1
according to DIN EN 10204



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Technical Data

Input pressure range ¹									
Nominal pressure gauge*	[bar]	-1...0	0.10	0.16	0.25	0.40	0.60	1	1.6
Nominal pressure abs.*	[bar]	-	-	-	-	0.40	0.60	1	1.6
Overpressure	[bar]	5	0.5	1	1	2	5	5	10
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15
Nominal pressure gauge / abs.	[bar]	2.5	4	6	10	16	25	40	
Overpressure	[bar]	10	20	40	40	80	80	105	
Burst pressure ≥	[bar]	15	25	50	50	120	120	210	
Vacuum resistance		P _N > 1 bar: unlimited vacuum resistance P _N ≤ 1 bar: on request							
¹ consider the pressure resistance of fitting and clamps									
* 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 = 8 ... 32 V _{DC}				SIL-version: V _S = 14 ... 28 V _{DC}			
Option IS-protection		2-wire: 4 ... 20 mA / V _S = 10 ... 28 V _{DC}				SIL-version: V _S = 14 ... 28 V _{DC}			
Options 3-wire		3-wire: 0 ... 20 mA / V _S = 14 ... 30 V _{DC} 0 ... 10 V / V _S = 14 ... 30 V _{DC}							
Performance									
Accuracy ²		standard: nominal pressure < 0.4 bar : ≤ ± 0.5 % span nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % span option: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % span							
Permissible load		current 2-wire: R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω current 3-wire: R _{max} = 500 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 % span / year at reference conditions							
Response time		2-wire: < 10 msec				3-wire: ≤ 3 msec			
² accuracy according to EN IEC 62828-2 – limit point adjustment (non-linearity, hysteresis, repeatability)									
Thermal effects (Offset and Span) ³ / Permissible temperatures									
Nominal pressure P _N	[bar]	-1 ... 0			< 0.40			≥ 0.40	
Tolerance band	[% span]	≤ ± 0.75			≤ ± 1,5			≤ ± 0.75	
in compensated range	[°C]	-20 ... 85			0 ... 50			-20 ... 85	
Permissible temperatures ⁴		medium ⁴ : -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food grade oil electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C							
Permissible temperature medium for cooling element ⁵		filling fluid silicon oil overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C ⁶				filling fluid food grade oil overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C ⁶			
³ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.									
⁴ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C									
⁵ max. temperature depends on the used sealing material, type of seal and installation									
⁶ 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							
Mechanical stability									
Vibration according to DIN EN 60068-2-6		G 1/2": 20 g RMS (25 ... 2000 Hz)				others: 10 g RMS (25 ... 2000 Hz)			
Shock according to DIN EN 60068-2-27		G 1/2": 500 g / 1 msec				others: 100 g / 1 msec			
Filling fluids									
Standard		silicon oil							
Options		food grade oil, compliant with 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request							
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 M16x1.5 brass, nickel plated (clamping range 2...8 mm)							
Seals (media wetted)		standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) optional: others on request Clamp, dairy pipe, Varivent®: without							
Diaphragm Standard		stainless steel 1.4435 (316 L)				Tantalum on request			
Optional		Hastelloy® C-276 (2.4819)							
Media wetted parts		pressure port, seal, diaphragm							

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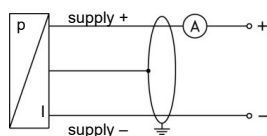
Technical Data

Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approvals DX9-DMP 331P	IBExU10ATEX1122 X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135°C Da
Safety technical maximum values	$U_i = 28$ V, $I_i = 93$ mA, $P_i = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ μ 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: -40/-20 ... 70 °C (lower temperature limit depends on the type of cable used)
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 μ H/m
Miscellaneous	
Option SIL ⁷ 2	according to IEC 61508 / IEC 61511
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 Combift 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
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Surface roughness	pressure port Ra < 0.8 μ m (media wetted parts) diaphragm Ra < 0.15 μ m weld seam Ra < 0.8 μ m
Weight	min. 200 g (depending on process connection)
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position for $P_N \leq 2$ bar have to be specified in the order)
Operational life	> 100 x 10 ⁶ pressure cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

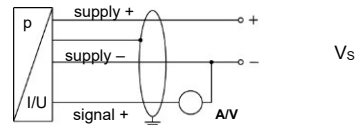
⁷ only for 4 ... 20 mA / 2-wire

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

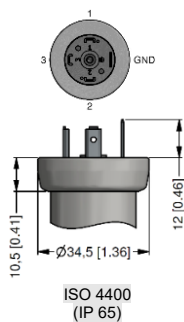


Pin configuration

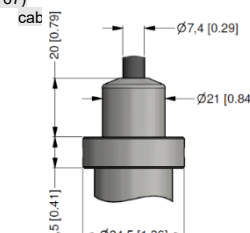
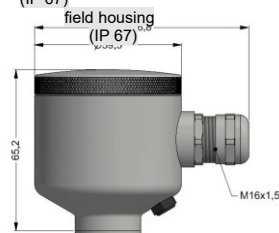
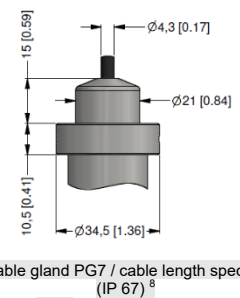
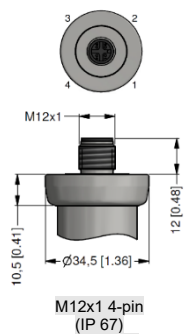
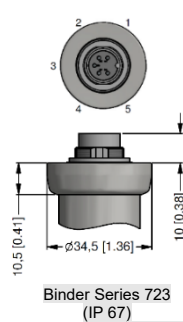
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colours (DIN 47100)
Supply +	1	3	1	IN +	wh (white)
Supply -	2	4	2	IN -	bn (brown)
Signal \square (only 3-wire)	3	1	3	OUT+	gn (green)
Shield	ground pin \oplus	5	4	\oplus	ye/gn (yellow / green)

Electrical connections (dimensions in mm)

standard



option



⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request

⁸ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)

⁹ different cable types and lengths available, permissible temperature depends on kind of cable

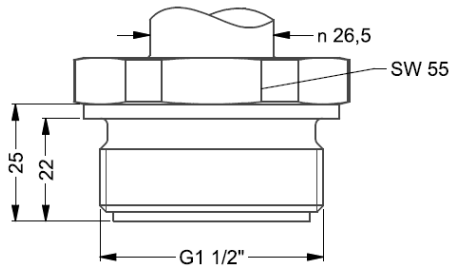
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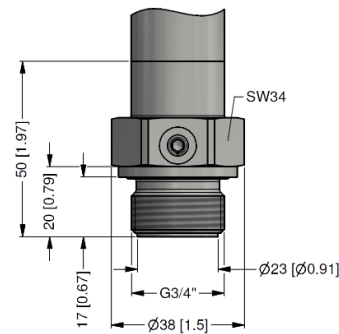
Mechanical connection (dimension in mm)

Standard

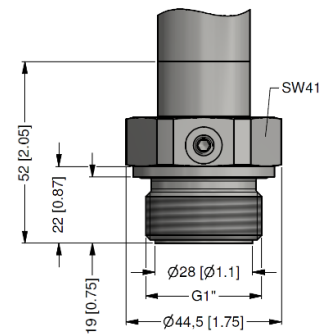


G1/2" flush DIN 3852¹⁰

Option

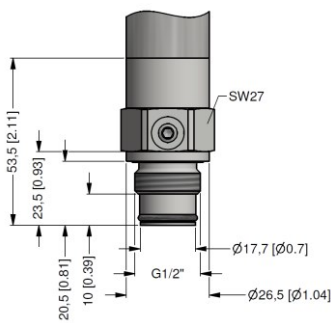


G 3/4" flush DIN 3852 with ISO 4400

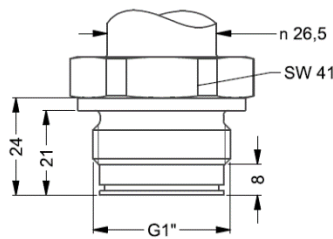


G1" flush DIN 3852 with ISO 4400

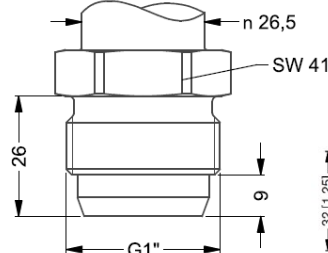
Option



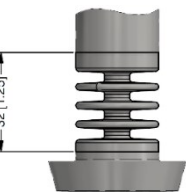
G1/2" flush with radial o-ring¹⁰



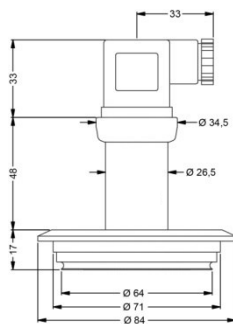
G1" flush with 2 radial o-ring ($P_N > 0,25$ bar)



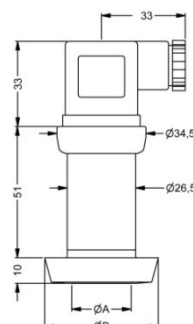
G1" cone with ISO 4400



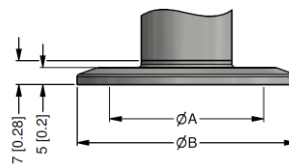
cooling element 300 °C



Varivent¹⁰
 $P_N \leq 10$ bar



dairy pipe (DIN 11851) with ISO 4400



Clamp (DIN 32676) with ISO 4400

dimension in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68,5
P_N [bar]	$\geq 0,25$ ≤ 40	$\geq 0,25$ ≤ 40	$\geq 0,25$ ≤ 25

dimension in mm				
size	3/4"	DN 25	DN 32	DN 50
A	14	23	32	45
B	25	50,5	50,5	64
P_N [bar]	≥ 4 ≤ 8	$\geq 0,25$ ≤ 16	≤ 16	≤ 16

* higher pressure ranges on request

⇒ SIL- and SIL-Ex version: total length increases by 28 mm! ; ⇒ metric threads and other versions on request

¹⁰ possible only for $P_N \geq 1$ bar; 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 331P

23.08.2024

DMP 331P

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Pressure																				
Gauge																				
Absolute	5	0	0																	
	5	0	1																	
Input [bar]																				
0 ... 0,1 ¹				1	0	0	0													
0 ... 0,16 ¹				1	6	0	0													
0 ... 0,25 ¹				2	5	0	0													
0 ... 0,4				4	0	0	0													
0 ... 0,6				6	0	0	0													
0 ... 1				1	0	0	1													
0 ... 1,6				1	6	0	1													
0 ... 2,5				2	5	0	1													
0 ... 4				4	0	0	1													
0 ... 6				6	0	0	1													
0 ... 10				1	0	0	2													
0 ... 16				1	6	0	2													
0 ... 25				2	5	0	2													
0 ... 40				4	0	0	2													
-1 ... 0 (temperature max. 70 °C)				X	1	0	2													
Customer				9	9	9	9													
Customer - underpressure (temperature max. 70 °C)				X	X	X	X													
Output																				
4...20 mA / 2-wire																				1
0...20 mA / 3-wire																				2
0 ... 10 V / 3-wire																				3
0...5 V / 3-wire																				4
4...20 mA / 3-wire																				7
Intrinsic safety Ex ia 4...20 mA / 2-wire																				E
SIL2, 4 ... 20 mA / 2-wire																				1S
SIL2, Intrinsic safety 4 ... 20 mA / 2-wire																				ES
Customer																				9
Accuracy																				
1 %																				8
0,5 % (P _N ≤ 0,4 bar)																				5
0,35 % (P _N > 0,4 bar)																				3
0,25 % (P _N > 0,4 bar)																				2
1 % including Calibration Certificate																				U
0,5 % including Calibration Certificate (P _N ≤ 0,4 bar)																				T
0,35 % including Calibration Certificate (P _N > 0,4 bar)																				S
0,25 % including Calibration Certificate (P _N > 0,4 bar)																				R
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 DIN 43650 (ISO 4400) - potting compound inside (IP 67)																				E 0 0
Cable outlet, cable with ventilation tube (IP 68) ²																				T R 0
+ PVC cable / 1 m																				
Connector M12 x 1, 4-pin (IP 67)																				M 0 0
Connector M12 x 1, 4-pin (IP 67) - metal																				M 1 0
Customer																				9 9 9
Mechanical connection																				
G 1/2" DIN 3852 flush (P _N > 1,5 bar) (only with seals) ⁴																				Z 0 0
M 20 x 1,5 DIN 3852 flush (P _N > 2,5 bar) (only with seals)																				D 0 4
G 3/4" DIN 3852 flush (P _N > 0,6 bar) (only with seals)																				Z 3 0
G 1" DIN 3852 flush (P _N > 0,25 bar) (only with seals)																				Z 3 1
G 1 1/2" DIN 3852 flush (only with seals)																				Z 3 3
G 2" DIN 3852 flush																				Z 3 4
G 1" DIN 3852 flush 2x O ring (P _N > 0,25 bar) ⁵																				Z 5 7
G 1/2" DIN 3852 flush 2x O ring (P _N > 1 bar) ⁴																				Z 6 1
G 3/4" DIN 3852 flush 2x O ring (P _N > 1 bar) ⁴																				Z 6 6
G1" flush cone seal (P _N > 0,25 bar) (without seals)																				K 3 1
1/8" NPT (without seals, monel pressure port, tantal membrane)																				Z 9 2
1" NPT flush (P _N > 0,25 bar) (without seals)																				N 5 4



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					
"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 flush (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 (2.4819)				H				
Tantalum				T				
Stainless steel 1.4435 (316 L) with PTFE foil (accuracy ≥ 1%)				3				
Customer				9				
Seals								
Without seals (Clamp, dairy pipe DIN, sandwich, flange, varivent)				0				
Viton (FKM) (for media temperature ≤ 200 °C)				1				
EPDM				3				
FFKM (for media temperature ≥ 200 °C)				7				
Customer				9				
Filling Fluids								
Silicone oil				1				
Edible oil for foodstuff industry (temperature max. 150 °C)				2				
Halocarbon				C				
Customer				9				
Special version								
Standard					0	0	0	
With cooling element from 125 °C up to 150 °C					1	5	0	
With cooling element from 150 °C up to 300 °C (max. 200 °C permanent)					2	0	0	
Customer					9	9	9	

3.1 Material Certificate for Membrane and Mechanical Connection

3.1 prot.

Settings in temperature different from basic 20 °C (+/- 10 °C, max. 70 bar and 200 °C)

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 absolute pressure possible from 0.4 bar

2 code TR0 = PVC cable, cable with ventilation tube available in different types and lengths; cable not included in the price

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 possible only for P_N ≤ 2 bar
