

DMP 331 P

Pressure Transmitter with Flush Pressure Port

- foodstuff industry, pharmaceutical and chemical industries, etc.
- medium temperature up to 300 °C
- accuracy:0.175% / 0.125% FSO BFSL(0.35 % / 0.25% FSO IEC 60770)
- nominal pressure ranges from0 ... 100 mbar up to 0 ... 40 bar

The DMP 331 P is a pressure transmitter for process measurement. Usage is possible with all media that are compatible with stainless steel 1.4435 (316L) and sealing material.

A piezoresistive stainless steel sensor, which features small thermal effect and excellent linearity, generate the base of the DMP 331 P. So it is possible to meet accuracy demands up to 0.25 % FSO (IEC 60770). Besides silicon oil and food compatible oil also Halocarbon or other filling oils can be delivered on request.

For usage with higher media temperature a cooling element can be added optionally. Thus media temperatures up to 300 °C can be achieved. The flush pressure ports are made with inch, clamp, or dairy pipe connection. Further pressure ports or chemical seals are available on request. Additional the DMP 331 P is suited for explosive area (zone 0).

Preferred areas of use are:

- process engineering
- chemical industry
- foodstuff industry
- paper industry

- small thermal effect
- good linearity
- good long term stability
- option Ex version: (only with 4 ... 20 mA / 2-wire) TÜV 03 ATEX 2006 X
- customer specific versions:
 - special pressure ranges
 - variety of electrical and mechanical connections
 - other versions on request

. Characteristics







Input pressure r	ang	е														
Nominal pressure gauge	[bar]	-10 ¹	0.10	0.16	0.25	0.4	0.6	1.0	1.6	2.5	4.0	6.0	10	16	25	40
Nominal pressure abs. 1	[bar]	-	-	-	-	-	0.6	1.0	1.6	2.5	4.0	6.0	10	16	25	40
Permissible overpressure	[bar]	3	1	1	1	1	3	3	6	6	20	20	60	60	60	100

Output signal / Sup	ply			
Standard	2-wire:	$4 \dots 20 \text{ mA} / V_s = 12 \dots 36 V_{DC}$	Ex-protection:	V _s = 14 28 V _{DC}
Optional	3-wire:	$0 \dots 20 \text{ mA} / V_s = 14 \dots 36 V_{DC}$ $0 \dots 10 \text{ V} / V_s = 14 \dots 36 V_{DC}$		

Performance				
Accuracy	nomina	I pressure > 0.4 bar: I pressure ≤ 0.4 bar: I pressure > 0.4 bar:	IEC 60770 ² ≤± 0.35 % FSO ≤± 0.50 % FSO ≤± 0.25 % FSO	BFSL $\leq \pm 0.175 \%$ FSO $\leq \pm 0.250 \%$ FSO $\leq \pm 0.125 \%$ FSO
Permissible load	current 2-wire: current 3-wire: voltage 3-wire:	$\begin{aligned} R_{\text{max}} &= \left[\left(V_{\text{S}} - V_{\text{S min}} \right) / \ 0.02 \right] \\ R_{\text{max}} &= 500 \ \Omega \\ R_{\text{min}} &= 10 \ k\Omega \end{aligned}$	Ω	
Influence effects	supply: load:	0.05 % FSO / 10 V 0.05 % FSO / kΩ		
Response time	< 10 msec			

Thermal e	ffects (Offse	et and Span)					
Nominal pressure	e P _N [bar]	-1 0	≤ 0.1	≤ 0.25	≤ 0.4	≤ 1.0	> 1.0
Tolerance band	[% FSO]	\leq \pm 0.75	≤ ± 2.0	≤± 1.5	≤ ± 1.0	≤± 1.0	≤± 0.75
TC, average	[% FSO / 10 K]	± 0.12	± 0.4	± 0.3	± 0.2	± 0.15	± 0.12
in compensated i	range [°C]	0 70		0 50		0	. 70

Electrical protection						
Short-circuit protection	permanent					
Reverse polarity protection	no damage, but also no function					
Electromagnetic compatibility	emission and immunity according to EN 61326					
Option Ex-protection only with 4 20 mA / 2-wire DX13-DMP 331 P	zone 0 4 : II 1 G EEx ia IIC T4 zone 20: II 1 D T 85°C safety technical maximum values: V_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i ≤ 1nF, L_i ≤ 10 μ H					

Mechanical stability	
Vibration	10 g RMS (20 2000 Hz)
Shock	100 g / 11 ms

Permissible temper	atures				
Medium	-25 125 °C ^{1, 5, 6}				
Electronics / environment	-25 85 °C	Ex-protection:	application in zone 0: application in zone 1 or higher:	-20 60 °C -25 70 °C	
Storage	-40 100 °C				

 $^{^{\}rm 1}$ for vacuum and nominal pressure abs. the max. medium temperature is 70 $^{\rm o}{\rm C}$

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

with optional cooling element its maximum permissible temperature is valid

pressure measurement

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³ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

⁴ approved for atmospheric pressure from 0.8 bar up to 1.1 bar

 $^{^{6}}$ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 30 minutes with a max. environmental temperature of 50 °C

Mechanical connection Inch Thread (DIN 3852) Clamp (ISO 2852) Connector DIN 43650 Connector DIN 43650 Connector DIN 43650 Connector DIN 43650 -ca.36 -035 -Ø35 -035 30,5 Ø26,5 3,90 -Ø26,5 -Ø26,5 70,5 80,5 -SW44 SW44 Clamp DN2 20.5 flush diaphragm Ø 45 (Ø50.5) G1" -ø30flush diaphragm for 1": Ø 24 ÿ50flush diaphragm for 1 1/2": Ø 32 flush diaphragm Ø 28 -Ø50 flush diaphragm Ø 30 G1" flush G1" flush DN1" or DN 1 1/2" DN2" with radial O-ring Dairy pipe (DIN 11851) **Cooling element** Connector DIN 43650 Pg 9 −Ø35 -- Ø26.5 Ø26.5 (ØC) flush diaphragm Ø D Dimensions in mm DN 25 DN 40 DN 50 size 107 89 89 Dimensions in mm В 71 53 53 150° C 300° C size С 56 68.5 44 Α

45

32

D

24

Electrical connection Standard **Optional** 24 **-**Ø35-M16 x1.5 (for cable-Ø (C (O) Ø26,5 (\bigcirc) 4 up to 11 mm) DIN 43650 Binder Series 723 M12x1 4-pin Field housing Cable gland 7 Buccaneer 5 (IP 65) (IP 67) (IP 67) (IP 67) (IP 68) (IP 67)

[⇒] Ex-protection: total length increases by 20 mm!

⁷ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube), optionally cable with ventilation tube

⁸ for gauge pressure cable with ventilation tube required

Filling Fluids	
Standard	silicon oil
Optional	food compatible oil (with FDA-approval) / Halocarbon / others on request

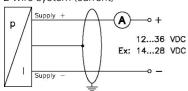
Materials	
Pressure port	stainless steel 1.4435 (316L) / Monel on request
Housing	stainless steel 1.4301 (304) / field housing 1.4305 (303) with cable gland of brass, nickel plated
Seals (media wetted)	inch thread: FKM / clamp und dairy pipe: without / others on request
Diaphragm	stainless steel 1.4435 (316L) / Tantalum and Hastelloy on request
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous			
Cable capacitance 9	cable without air tube: cable with air tube:	signal line/shield: 160 pF/m signal line/shield: 150 pF/m	signal line/signal line: 120 pF/m signal line/signal line: 100 pF/m
Cable inductance 9	cable without air tube: cable with air tube:	signal line/shield: 0.65 μH/m signal line/shield: 1.0 μH/m	signal line/signal line: 0.65 μH/m signal line/signal line: 1.0 μH/m
Current consumption	signal output current: signal output voltage:	max. 25 mA max. 7 mA	
Weight	min. 200 g (depending	on process connection)	
Installation position	any 10		
Operational life	> 100 x 10 ⁶ cycles		

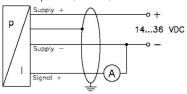
Pin config	guration					
Electrical connec	ction	DIN 43650	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	cable colours ⁹ (DIN 47100)
2-wire-system	Supply + Supply –	1 2	3 4	1 2	1 2	white brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply + Supply – Signal +	1 2 3	3 4 1	1 2 3	1 2 3	white brown green
	Ground	ground pin	5	4	4	yellow / green (shield)

Wiring diagrams

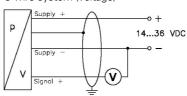
2-wire-system (current)



3-wire-system (current)



3-wire-system (voltage)



 $^{^{\}rm 9}$ if the electrical connection is a mounted cable by factory

BD SENSORS
pressure measurement

331P E 010706

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

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 $P_N \le 1$ bar.



Ordering Code DMP 331P

	racing			50 11	
DMP 331P		\square - \square - \square		□□-□-□-□-	
Pressure					
gauge	5 0 0 1, 2 5 0 1				
Input [bar]	1, 2 5 0 1				
0,10	1 0 0	0 0			
0,16 0,25	1 6 0 2 5 0	0 0			
0,40	4 0 0	0 0			
0,60	6 0 0	0 0 1			
1,0 1,6	1 6 0				
2,5	2 5 0				
4,0 6,0	4 0 0 6 0 0				
10	6 0 0	2			
16 25	1 6 0 2 5 0	0 2			
40	4 0 0	2			
-1 0 customer	1 X 1 0 9 9 9	9 9			
Output	3,3,0				
4 20 mA / 2-wire 0 20 mA / 3-wire		1 2			
0 10 V / 3-wire		3			
Intrinsic safety 4 20 mA / 2-wire customer		E 9			
Accuracy					
standard for $P_N > 0.4$ bar 0.35 % standard for $P_N \le 0.4$ bar 0.5 %		3 5			
option for $P_N > 0.4$ bar 0.25%		2			
customer Electrical connection		9			
Male and female plug DIN 43650			1 0 0		
Binder series 723 (5-pin) Cable gland incl. cable	3		2 0 0 4 0 0		
Male plug Buccaneer IP68			5 0 0		
M12x1 (4-pin) Field housing stainless steel	5		M 0 0 8 0 0		
customer			9 9 9		
Mechanical connection G1" with flush			_		
welded diaphragm (DIN 3852) G1" with radial O-ring and flush			Z	3 1	
welded diaphragm (DIN 3852)			Z	5 7	
Clamp 1" (ISO 2852)			C	6 1	
Clamp 1 1/2" (ISO 2852) Clamp 2" (ISO 2852)			C C	6 2 6 3	
Dairy pipe DN 25 (DIN 11851)			M	7 3	
Dairy pipe DN 40 (DIN 11851) Dairy pipe DN 50 (DIN 11851)			M M	7 5 7 6	
customer			9	9 9	
Diaphragm Stainless steel 1.4435 (316L)				1	
customer				9	
Seals for Clamp or Dairy pipe without				0	
for inch thread FKM				1	
Filling Fluids customer				9	
Silicon oil				1	
food compatible oil Halocarbon	6			2 C	
customer				9	
Special version					0 0 0
standard with cooling element up to 150°C					0 0 0 1 5 0
with cooling element up to 300°C					2 0 0
customer					9 9 9

 $^{^{\}rm 1}$ for vacuum and nominal pressure abs. the max. medium temperature is 70 $^{\rm o}{\rm C}$

⁶ Name of oil: Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662



 $^{^{2}}$ absolute pressure possible from 0,60 bar

³ different cable types and lengths deliverable, standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube

⁴ for gauge pressure cable with ventilation tube required

⁵ The cup nut for dairy pipe has to be mounted by production of pressure transmitter with Electrical connection field housing and Mechanical connection dairy pipe.

The cup nut for dairy pipe has to be ordered as separate position.