

DMP 331P

Industrial Pressure Transmitter

Process Connections With
Flush Welded Stainless Steel
Diaphragm

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % FSO



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
- ▶ diaphragm with low surface roughness
- ▶ 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 EN 10204
- ▶ test report 2.2
according to EN 10204



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Technical Data

Input pressure range ¹									
Nominal pressure gauge / abs.	[bar]	-1...0	0.10	0.16	0.25	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									
Output signal / Supply									
Standard		2-wire: 4 ... 20 mA / V _S = 8 ... 32 V _{DC}							
Option IS-protection		2-wire: 4 ... 20 mA / V _S = 10 ... 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 % FSO nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO option: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO							
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 % FSO / 10 V				load: 0.05 % FSO / kΩ			
Long term stability		≤ ± 0.1 % FSO / year at reference conditions							
Response time		2-wire: < 10 msec				3-wire: ≤ 3 msec			
² accuracy according to IEC 60770 – 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	[% FSO]	≤ ± 0.75			≤ ± 1.5			≤ ± 0.75	
in compensated range	[°C]	-20 ... 85			0 ... 50			-20 ... 85	
Permissible temperatures ⁴		medium: -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 300°C		filling fluid silicon oil		overpressure: -40 ... 300 °C		vacuum: -40 ... 150 °C ⁵		filling fluid food grade oil overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C ⁵	
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 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 DTE FM 32; Category Code: H1; NSF Registration No.: 130662)						others on request	
Materials									
Pressure port		stainless steel 1.4404 (316 L)			others on request				
Housing		stainless steel 1.4404 (316 L)							
Option compact field housing		stainless steel 1.4305 (303), cable gland brass, nickel plated						others on request	
Seals (media wetted)		Standard FKM (recommended for medium temperatures ≤ 200 °C) Optional FFKM (recommended for medium temperatures > 200 °C) Clamp, dairy pipe, Varivent®: without							
Diaphragm		Standard stainless steel 1.4435 (316 L) Optional Hastelloy® C-276 (2.4819)							
Media wetted parts		pressure port, seal, diaphragm							

Explosion protection (only for 4 ... 20 mA / 2-wire)					
Approvals DX 19-DMP 331P	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIC T 85°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 ... 70 °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					
Option SIL ⁶ 2	according to IEC 61508 / IEC 61511				
Current consumption	signal output current: max. 25 mA		signal output voltage: max. 7 mA		
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 $P_N \leq 2\text{ bar}$ have to be specified in the order)				
Operational life	> 100 x 10 ⁶ pressure cycles				
CE-conformity	EMC Directive: 2004/108/EC				
ATEX Directive	94/4/EG				
⁶ 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 (only 3-wire)	3	1	3	OUT+	gn (green)
Shield	ground pin	5	4	⏏	ye/gn (yellow / green)
Electrical connections (dimensions in mm)					
standard		option			
ISO 4400 (IP 65)		Binder Series 723 (IP 67)		M12x1 4-pin (IP 67)	
<p>⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request</p>					
⁷ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)					
⁸ different cable types and lengths available, permissible temperature depends on kind of cable					

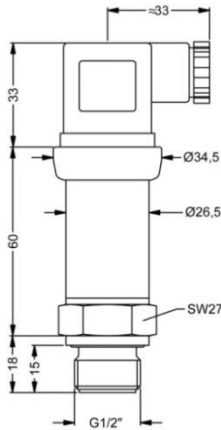
DMP 331P

Industrial Pressure Transmitter

Technical Data

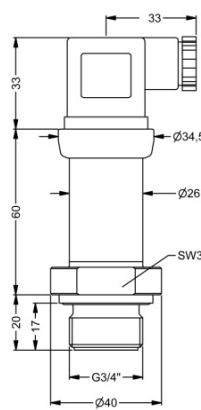
Mechanical connection (dimension in mm)

Standard

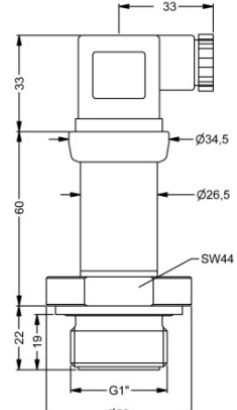


G1/2" flush DIN 3852⁹

Option

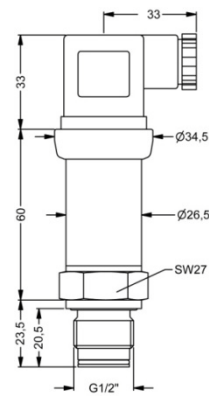


G 3/4" flush DIN 3852 with ISO 4400

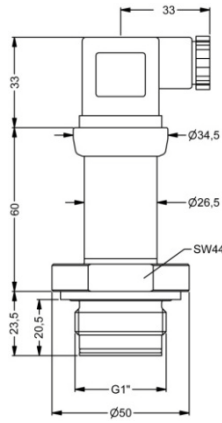


G1" flush DIN 3852 with ISO 4400

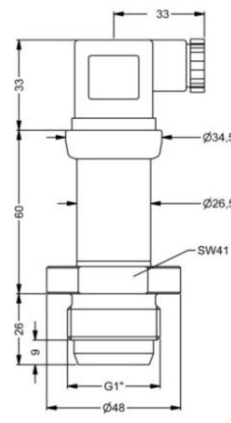
Option



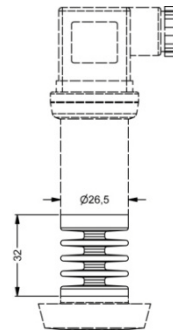
G1/2" flush with radial o-ring⁹



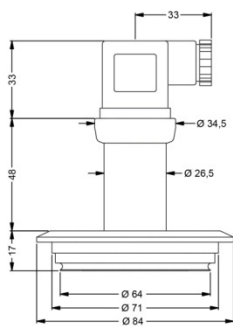
G1" flush with radial o-ring (P_N ≤ 2 bar)



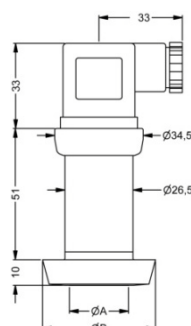
G1" cone with ISO 4400



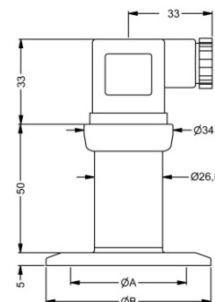
cooling element 300 °C



Varivent[®] PN ≤ 25 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]	≤ 40	≤ 40	≤ 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]	≤ 8	≤ 16	≤ 16	≤ 16

- ⇒ **SIL- and SIL-Ex version: total length increases by 26.5 mm!**
- ⇒ **metric threads and other versions on request**

⁹ possible only for P_N ≥ 1 bar

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

Ordering code DMP 331P

DMP 331P



Pressure																				
gauge		5	0	0																
absolute		5	0	1																
Input [bar]																				
0.10		1	0	0	0															
0.16		1	6	0	0															
0.25		2	5	0	0															
0.40		4	0	0	0															
0.60		6	0	0	0															
1.0		1	0	0	1															
1.6		1	6	0	1															
2.5		2	5	0	1															
4.0		4	0	0	1															
6.0		6	0	0	1															
10		1	0	0	2															
16		1	6	0	2															
25		2	5	0	2															
40		4	0	0	2															
-1 ... 0		X	1	0	2															
customer		9	9	9	9														consult	
Output																				
4 ... 20 mA / 2-wire						1														
0 ... 20 mA / 3-wire						2														
0 ... 10 V / 3-wire						3														
Intrinsic safety 4 ... 20 mA / 2-wire						E														
SIL2 4 ... 20 mA / 2-wire						1S														
SIL2 with Intrinsic safety 4 ... 20 mA / 2-wire						ES														
customer						9													consult	
Accuracy																				
standard for $P_N \geq 0.4$ bar	0.35 %					3														
standard for $P_N < 0.4$ bar	0.5 %					5														
option for $P_N \geq 0.4$ bar	0.25 %					2														
customer						9													consult	
Electrical connection																				
Male and female plug ISO 4400						1	0	0												
Male plug Binder series 723 (5-pin)						2	0	0												
Cable outlet with PVC-cable ¹						T	A	0												
Cable outlet ²						T	R	0												
Male plug M12x1 (4-pin) / metal						M	1	0												
Compact field housing stainless steel						8	5	0												
stainless steel 1.4305 ³																				
customer						9	9	9												consult
Mechanical connection																				
G1/2" with flush welded diaphragm (DIN 3852) ⁴						Z	0	0												
G3/4" with flush welded diaphragm (DIN 3852)						Z	3	0												
G1" with flush welded diaphragm (DIN 3852)						Z	3	1												
G1" DIN 3852 with rad. o-ring and flush diaphragm ⁵						Z	5	7												
G1/2" DIN 3852 with rad. o-ring and flush diaphragm ⁴						Z	6	1												
G 1" cone						K	3	1												
Clamp DN 25 (ISO 2852)						C	6	1												
Clamp DN 38 (ISO 2852)						C	6	2												
Clamp DN 51 (ISO 2852)						C	6	3												
Dairy pipe DN 25 (DIN 11851) ³						M	7	3												
Dairy pipe DN 40 (DIN 11851) ³						M	7	5												
Dairy pipe DN 50 (DIN 11851) ³						M	7	6												
customer						9	9	9												consult
Diaphragm																				
Stainless steel 1.4435 (316L)								1												
Tantalum								T												consult
Hastelloy® C-276 (2.4819)								H												
customer								9												consult
Seals																				
for clamp or dairy pipe:	without							0												
for inch thread - standard:	FKM							1												
for inch thread - option:	FFKM							7												
customer								9												consult
Filling Fluids																				
silicon oil								1												
food compatible oil								2												
customer								9												consult
Special version																				
standard										0	0	0								
with cooling element up to 300°C										2	0	0								
customer										9	9	9								consult

¹ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C), others on request
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 pre-mounted by production of pressure transmitter with electrical connection field housing in combination with the mechanical connection dairy pipe.
 The cup nut has to be ordered as separate position.
⁴ possible only for $P_N \geq 1$ bar
⁵ possible only for $P_N \leq 2$ bar

