

# DMP 331P

## Industrial Pressure Transmitter

Pressure Ports And 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 process connections, EHEDG-conformity
- ▶ reduced oil volume, minimises temperature influence at zero point
- ▶ CIP / SIP cleaning up to 150 °C
- ▶ vacuum resistant



### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL 2  
according to IEC 61508 / IEC 61511
- ▶ special materials  
as Hastelloy® and Tantal
- ▶ cooling element for media  
temperatures up to 300 °C

The pressure transmitter DMP 331P was designed for use in the food and pharmaceutical industry. The compact design with hygienic process connections 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. This transmitter fulfills nearly all requirements in hygienic industrial processes.

### Preferred areas of use are

-  Food Industry
-  Pharmacy

### Material and test certificates

- ▶ material mill test report  
according to DIN EN 10204-3.1.
- ▶ specific test report  
according to DIN EN 10204-2.2.



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Technical Data

Input pressure range <sup>1</sup>									
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 <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance P <sub>N</sub> ≤ 1 bar: on request						

<sup>1</sup> consider the pressure resistance of fitting and clamps

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 8 ... 32 V <sub>DC</sub>
Option IS-protection	2-wire: 4 ... 20 mA / V <sub>S</sub> = 10 ... 28 V <sub>DC</sub>
Options 3-wire	3-wire: 0 ... 20 mA / V <sub>S</sub> = 14 ... 30 V <sub>DC</sub> 0 ... 10 V / V <sub>S</sub> = 14 ... 30 V <sub>DC</sub>

Performance	
Accuracy <sup>2</sup>	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 <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω current 3-wire: R <sub>max</sub> = 500 Ω voltage 3-wire: R <sub>min</sub> = 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

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

Thermal effects (Offset and Span) <sup>3</sup> / Permissible temperatures			
Nominal pressure P <sub>N</sub>	[bar]	-1 ... 0	< 0.40
Tolerance band	[% FSO]	≤ ± 0.75	≤ ± 1,5
in compensated range	[°C]	-20 ... 85	0 ... 50
Permissible temperatures <sup>4</sup>		medium: -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food compatible oil electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C	≥ 0.40
Permissible temperature medium for cooling element 300°C		filling fluid silicon oil overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C <sup>5</sup> filling fluid food compatible oil overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C <sup>5</sup>	

<sup>3</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.

<sup>4</sup> max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C

<sup>5</sup> also for P<sub>abs</sub> ≤ 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 except G 1/2": 10 g RMS (25 ... 2000 Hz)
Shock according to DIN EN 60068-2-27	G 1/2": 500 g / 1 msec others except G 1/2": 100 g / 1 msec

Filling fluids	
Standard	silicon oil
Options	food compatible oil with FDA approval (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) option: FFKM (recommended for medium temperatures > 200 °C) others on request clamp and dairy pipe: without
Diaphragm	stainless steel 1.4435 (316 L) / Tantalum and Hastelloy® C-276 (2.4819) on request
Media wetted parts	pressure port, seals, diaphragm

Explosion protection (only for 4 ... 20 mA / 2-wire)					
Approvals DX 19-DMP 331P	<b>IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X</b> zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC 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				
Max. temperatures for environment	in zone 0: -20 ... 60 °C with $p_{\text{atm}}$ 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 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 <sup>8</sup> pressure cycles				
CE-conformity	EMC Directive: 2004/108/EC				
ATEX Directive	94/4/EG				
Wiring diagrams					
2-Leiter-System (Strom)			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		gn/ye (green / yellow)
Electrical connections (dimensions in mm)					
standard		option			
ISO 4400 (IP 65)		Binder Series 723 (IP 67)		cable outlet with PVC cable (IP 67) <sup>6</sup>	
		compact field housing (IP 67)		cable outlet, cable with ventilation tube (IP 68) <sup>7</sup>	
⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request					
<sup>6</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)					
<sup>7</sup> different cable types and lengths available, permissible temperature depends on kind of cable					

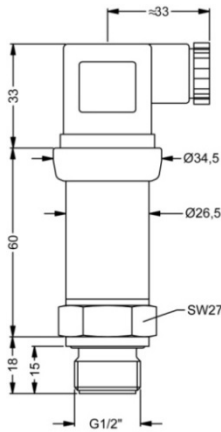
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Industrial Pressure Transmitter

Technical Data

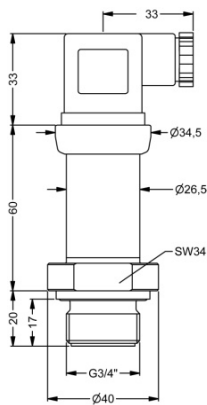
## Mechanical connection (dimension in mm)

### Standard

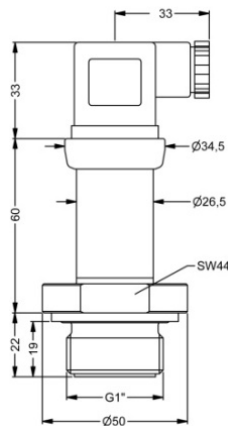


G1/2" flush DIN 3852<sup>8</sup>

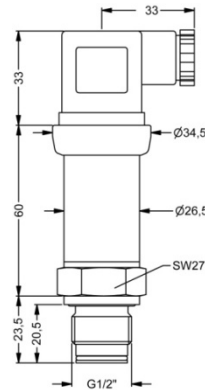
### Option



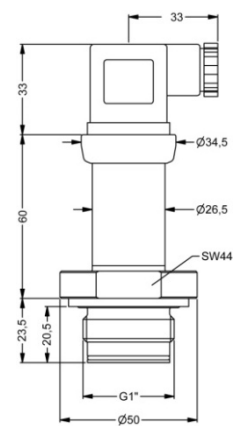
G 3/4" flush DIN 3852 with ISO 4400



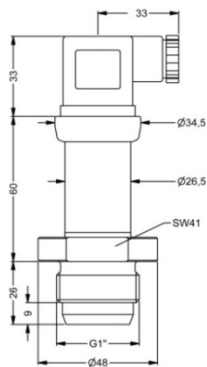
G1" flush DIN 3852 with ISO 4400



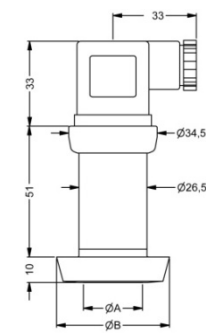
G1/2" flush with radial o-ring<sup>8</sup>



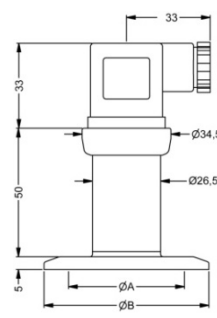
G1" flush with radial o-ring



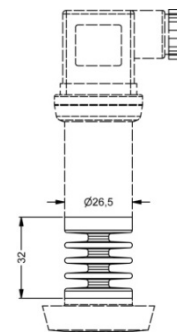
G1" cone with ISO 4400



dairy pipe (DIN 11851) with ISO 4400



clamp (ISO 2852) with ISO 4400



cooling element 300 °C

dimension in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68.5
PN	≤ 40	≤ 40	≤ 25

dimension in mm			
size	DN 25	DN 38	DN 51
A	23	32	45
B	50.5	50.5	64
PN	≤ 16	≤ 16	≤ 16

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

<sup>8</sup> possible only for  $P_N \geq 1$  bar

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

## Ordering code DMP 331P

DMP 331P

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Pressure		5	0	0																		
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 <sup>1</sup>						T	A	0														
Cable outlet <sup>2</sup>						T	R	0														
Male plug M12x1 (4-pin) / metal						M	1	0														
Compact field housing stainless steel						8	5	0														
stainless steel 1.4305 <sup>3</sup>						9	9	9														consult
customer																						
Mechanical connection																						
G1/2" with flush welded diaphragm (DIN 3852) <sup>4</sup>						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 <sup>5</sup>						Z	5	7														
G1/2" DIN 3852 with rad. o-ring and flush diaphragm <sup>4</sup>						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) <sup>3</sup>						M	7	3														
Dairy pipe DN 40 (DIN 11851) <sup>3</sup>						M	7	5														
Dairy pipe DN 50 (DIN 11851) <sup>3</sup>						M	7	6														
customer						9	9	9														consult
Diaphragm																						
Stainless steel 1.4435 (316L)																						1
Tantalum																						T
Hastelloy® C-276 (2.4819)																						H
customer																						9
Seals																						
for clamp or dairy pipe:	without																					0
for inch thread - standard:	FKM																					1
for inch thread - option:	FFKM																					7
customer																						9
Filling Fluids																						
silicon oil																						1
food compatible oil																						2
customer																						9
Special version																						
standard																						0 0 0
with cooling element up to 300°C																						2 0 0
customer																						9 9 9

<sup>1</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C), others on request  
<sup>2</sup> cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable  
<sup>3</sup> 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.  
<sup>4</sup> possible only for  $P_N \geq 1$  bar  
<sup>5</sup> possible only for  $P_N \leq 2$  bar

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