



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

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Industrial
Pressure Transmitter

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
- ▶ excellent long term stability

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
- ▶ customer specific versions



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 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		$P_N \geq 1$ bar: unlimited vacuum resistance $P_N \leq 1$ bar: on request							
¹ consider the pressure resistance of fitting and clamps									
Output signal / Supply									
Standard		2-wire: 4 ... 20 mA / $V_S = 8 \dots 32 V_{DC}$							
Option IS-protection		2-wire: 4 ... 20 mA / $V_S = 10 \dots 28 V_{DC}$							
Options 3-wire		3-wire: 0 ... 20 mA / $V_S = 14 \dots 30 V_{DC}$ 0 ... 10 V / $V_S = 14 \dots 30 V_{DC}$							
Performance									
Accuracy ²		standard: nominal pressure < 0.4 bar: $\leq \pm 0.5$ % FSO nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO option: nominal pressure ≥ 0.4 bar: $\leq \pm 0.25$ % FSO							
Permissible load		current 2-wire: $R_{max} = [(V_S - V_{S min}) / 0.02] \Omega$ current 3-wire: $R_{max} = 500 \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$							
Influence effects		supply: 0.05 % FSO / 10 V				load: 0.05 % FSO / kΩ			
Long term stability		$\leq \pm 0.1$ % 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]	$\leq \pm 0.75$			$\leq \pm 1,5$			$\leq \pm 0.75$	
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 compatible 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 compatible 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 $P_{abs} \leq 1$ 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)					
		clamp and dairy pipe:		others on request					
				without					
Diaphragm		stainless steel 1.4435 (316 L) / Tantalum and Hastelloy® C-276 (2.4819) on request							
Media wetted parts		pressure port, seals, diaphragm							

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Explosion protection (only for 4 ... 20 mA / 2-wire)					
Approval DX 19-DMP 331P	IBExU 10 ATEX 1068 X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex iaD 20 T85 °C				
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_{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. 5 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				
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		gn/ye (green / yellow)
Electrical connections (dimensions in mm)					
standard 		option 			
<p>ISO 4400 (IP 65)</p>		<p>Binder Series 723 (IP 67)</p>		<p>M12x1 4-pin (IP 67)</p>	
		<p>compact field housing (IP 67)</p>		<p>cable outlet, cable with ventilation tube (IP 68)⁷</p>	
<p>⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request</p>					
<p>⁶ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)</p>					
<p>⁷ different cable types and lengths available, permissible temperature depends on kind of cable</p>					

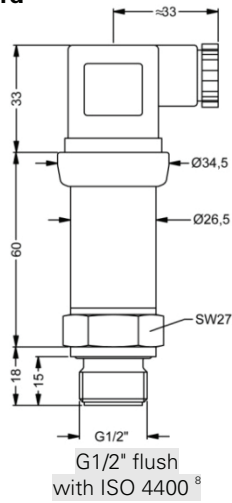
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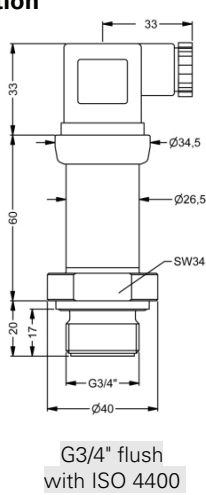
Technical Data

Mechanical connection (dimension in mm)

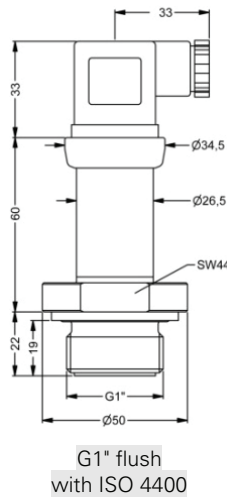
Standard



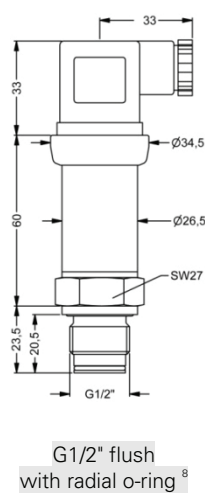
Option



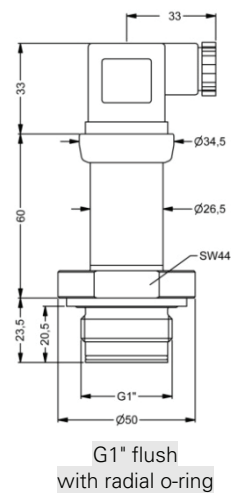
G3/4" flush
with ISO 4400



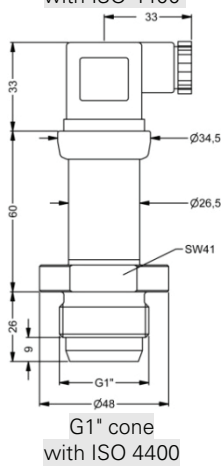
G1" flush
with ISO 4400



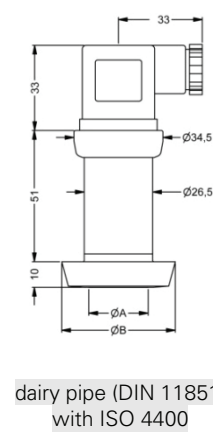
G1/2" flush
with radial o-ring⁸



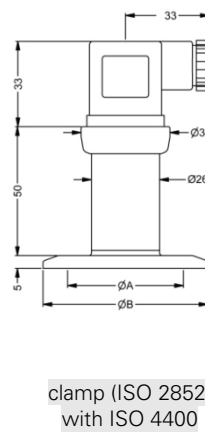
G1" flush
with radial o-ring



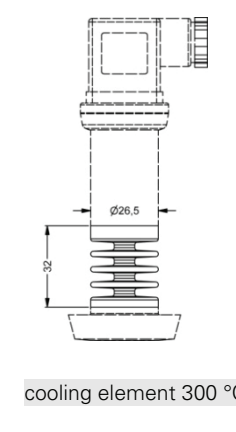
G1" cone
with ISO 4400



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

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

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

⁸ possible only for $P_N \bullet 1 \text{ bar}$

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

