



DMK 331P

Industrial Pressure Transmitter

Pressure Ports with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:
0.5 % FSO

Nominal pressure

from 0 ... 60 bar up to 0 ... 400 bar

Output signals

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- suited for viscous and pasty media

Optional versions

- IS-version
Ex ia = intrinsically safe for gases and dusts
- SIL 2
according to IEC 61508 / IEC 61511
- food compatible filling fluid with FDA approval
- cooling element for media temperatures up to 300 °C
- customer specific versions

The pressure transmitter DMK 331P is suitable for measuring the pressure of viscous and pasty media, where a totally flush pressure port is required.

As on all industrial pressure transmitters made by BD|SENSORS, you may choose between various electrical and mechanical connections also on DMK 331P.

Preferred areas of use are



Plant and machine engineering



Food industry

Preferred used for



Viscous and pasty media



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Technical Data

Input pressure range						
Nominal pressure gauge/abs. [bar]	60	100	160	250	400	
Overpressure [bar]	100	200	400	400	600	
Burst pressure ≥ [bar]	180	300	500	750	1000	
Output signal / Supply						
Standard	2-wire:	4 ... 20 mA / $V_S = 8 \dots 32 \text{ V}_{\text{DC}}$		SIL-version: $V_S = 14 \dots 28 \text{ V}_{\text{DC}}$		
Option IS-protection	2-wire:	4 ... 20 mA / $V_S = 10 \dots 28 \text{ V}_{\text{DC}}$		SIL-version: $V_S = 14 \dots 28 \text{ V}_{\text{DC}}$		
Options 3-wire	3-wire:	0 ... 20 mA / $V_S = 14 \dots 30 \text{ V}_{\text{DC}}$ 0 ... 10 V / $V_S = 14 \dots 30 \text{ V}_{\text{DC}}$				
Performance						
Accuracy ¹		≤ ± 0.5 % FSO				
Permissible load		current 2-wire: $R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0.02 \text{ A}] \Omega$ current 3-wire: $R_{\text{max}} = 500 \Omega$ voltage 3-wire: $R_{\text{min}} = 10 \text{ k}\Omega$				
Influence effects		supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ				
Long term stability		≤ ± 0.3 % FSO / year at reference conditions				
Response time	2-wire:	≤ 10 msec				
	3-wire:	≤ 3 msec				
¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)						
Thermal effects (Offset and Span) ² / Permissible temperatures						
Thermal error		≤ ± 0.2 % FSO / 10 K				
In compensated range		-20 ... 85°C				
Permissible temperatures ³		medium: -40 ... 125 °C for filling fluid silicone 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 silicone oil	overpressure: -40 ... 300 °C	vacuum: -40 ... 150 °C			
	filling fluid food compatible oil	overpressure: -10 ... 250 °C	vacuum: -10 ... 150 °C			
² an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.						
³ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C						
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		20 g RMS (25 ... 2000 Hz)	according to DIN EN 60068-2-6			
Shock		500 g / 1 msec	according to DIN EN 60068-2-27			
Filling fluids						
Standard		silicone oil				
Options		food compatible oil (with FDA approval) (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request				
Materials						
Pressure port		stainless steel 1.4435 (316 L)				
Housing		stainless steel 1.4404 (316 L)				
Option compact field housing		stainless steel 1.4301 (304); cable gland M12x1.5, brass, nickel plated (clamping range 2 ... 8 mm)				
Seals		standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM ⁴ (recommended for medium temperatures > 200 °C) others on request				
Diaphragm		stainless steel 1.4435 (316 L)				
Media wetted parts		pressure port, seals, diaphragm				
⁴ for pressure ranges $p_N \leq 100 \text{ bar}$						
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approvals DX19-DMK 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 IIIC T135 °C Da				
Safety technical maximum values		$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C_i \approx 0 \text{ nF}$, $L_i \approx 0 \mu\text{H}$, the supply connections have an inner capacity of max. 27 nF to the housing				
Permissible 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: -40/-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 μH/m				

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Technical Data

Miscellaneous

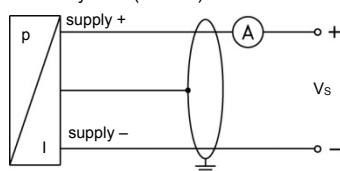
Option SIL 2 version ⁵	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	min. 200 g (depending on process connection)
Installation position	any (standard calibration in a vertical position with the pressure port connection down)
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	Pressure Equipment Directive: 2014/68/EU (module A) ⁶ 2014/34/EU

⁵ only for 4 ... 20 mA / 2-wire

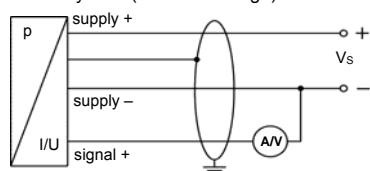
⁶ this directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

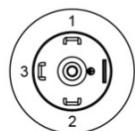
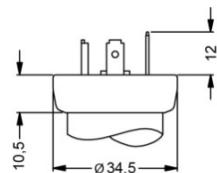


Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colour (IEC 60757)
Supply +	1	3	1	IN +	WH (white)
Supply -	2	4	2	IN -	BN (brown)
Signal + (only for 3-wire)	3	1	3	OUT +	GN (green)
Shield	ground pin	5	4		GNYE (green-yellow)

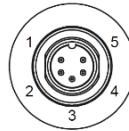
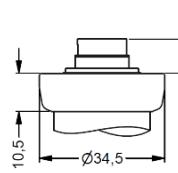
Electrical connection (dimensions in mm)

standard

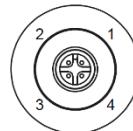
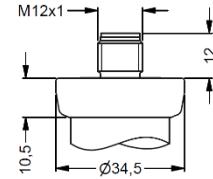


ISO 4400
(IP 65)

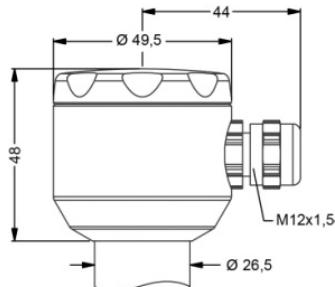
options



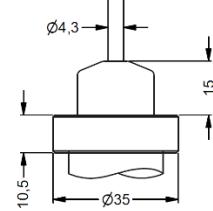
Binder Series 723, 5-pin
(IP 67)



M12x1, 4-pin
(IP 67)



compact field housing
(IP 67)



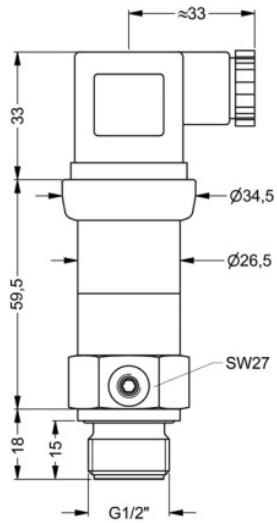
cable outlet with PVC cable
(IP 67) ⁷

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

⁷ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)

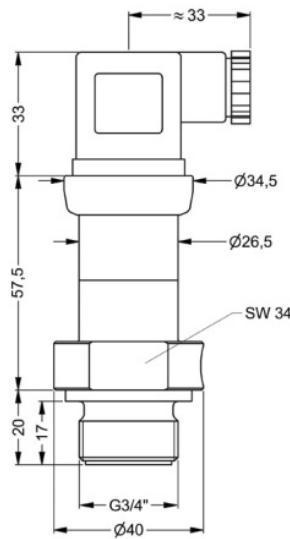
Mechanical connection (dimensions in mm)

standard

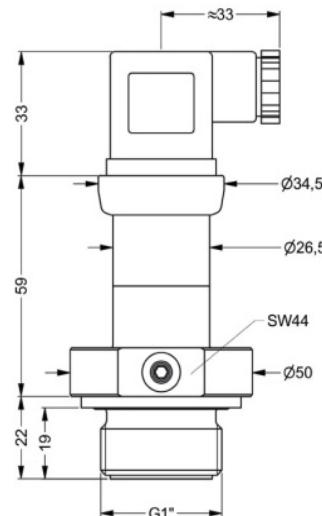


G1/2" flush DIN 3852

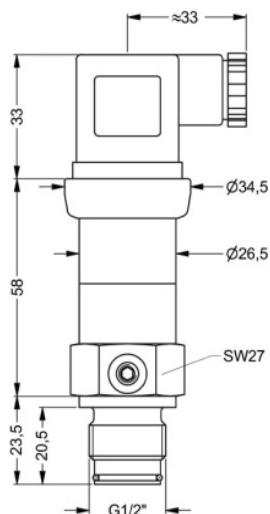
options



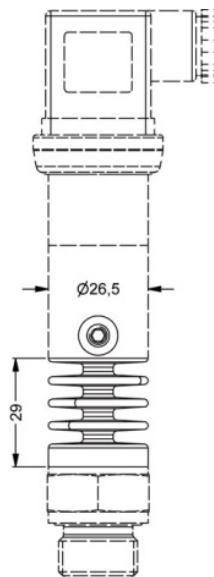
G3/4" flush DIN 3852



G1" flush DIN 3852



G1/2" flush
with radial o-ring



cooling element
300 °C ⁸

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

⁸ possible for nominal pressure ranges $p_N \leq 160$ bar