

# DMK 331P

## Industrial Pressure Transmitter

Pressure Ports With Flush Welded Stainless Steel Diaphragm

accuracy according to EN IEC 62828-2:  
0.5 % span



### 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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BUREAU  
VERITAS

The company BD SENSORS s.r.o. is certified by Bureau Veritas Czech according to the standard ISO 9001.

Input pressure range	
Nominal pressure gauge / abs. [bar]	60                      100                      160                      250                      400
Overpressure [bar]	100                      100                      200                      400                      400
Burst pressure $\geq$ [bar]	120                      180                      300                      500                      750

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / $V_S = 8 \dots 32$ VDC      SIL-version: $V_S = 14 \dots 28$ V <sub>DC</sub>
Option IS-protection	2-wire: 4 ... 20 mA / $V_S = 10 \dots 28$ V <sub>DC</sub> SIL-version: $V_S = 14 \dots 28$ V <sub>DC</sub>
Options 3-wire	3-wire: 0 ... 20 mA / $V_S = 14 \dots 30$ V <sub>DC</sub> 0 ... 10 V / $V_S = 14 \dots 30$ V <sub>DC</sub>

Performance	
Accuracy <sup>1</sup>	$\leq \pm 0.5$ % span
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ current 3-wire: $R_{max} = 500 \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$
Influence effects	supply: 0.05 % span / 10 V load: 0.05 % span / k $\Omega$
Long term stability	$\leq \pm 0.3$ % span / year at reference conditions
Response time	2-wire: $\leq 10$ msec 3-wire: $\leq 3$ msec

<sup>1</sup> accuracy according to EN IEC 62828-2– limit point adjustment (non-linearity, hysteresis, repeatability)

Thermal effects (Offset and Span) <sup>2</sup> / Permissible temperatures	
Thermal error	$\leq \pm 0.2$ % span / 10 K
in compensated range	-20 ... 85°C
Permissible temperatures	medium <sup>3</sup> :                      -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 <sup>4</sup>	filling fluid silicon oil                      overpressure: -40 ... 300 °C                      vacuum: -40 ... 150 °C filling fluid food compatible oil                      overpressure: -10 ... 250 °C                      vacuum: -10 ... 150 °C

<sup>2</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.  
<sup>3</sup> max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C  
<sup>4</sup> max. temperature depends on the used sealing material, type of seal and installation

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	silicon 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 1.4404 (316 L)
Housing	stainless steel 1.4404 (316 L)
Option field housing	stainless steel 1.4301 (304) with cable gland 16x 1.5 brass, nickel plated (clamping range 2...8 mm)
Seals (media wetted)	standard: FKM (recommended for medium temperatures $\leq 200$ °C) option: FFKM <sup>5</sup> (recommended for medium temperatures $\leq 260$ °C) others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm

<sup>5</sup> for pressure ranges  $\leq 100$  bar

Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approvals DX9-DMK 331P	<b>IBExU10ATEX1122 X</b> zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 135°C Da
Safety technical maximum values	$U_i = 28$ V, $I_i = 93$ mA, $P_i = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ $\mu$ H
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 $\mu$ H/m

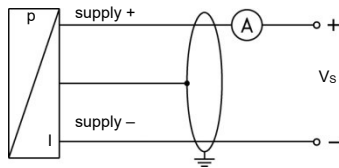
Miscellaneous	
Option SIL 2 <sup>6</sup>	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	min. 200 g (depending on process connection)
Installation position	any (standard calibration in a vertical position with the pressure port connection down)
Operational life	> 100 x 10 <sup>6</sup> pressure cycles
CE-conformity	EMC Directive: 2014/30/EU      Pressure Equipment Directive: 2014/68/EU (module A) <sup>7</sup>
ATEX Directive	2014/34/EU

<sup>6</sup> only for 4 ... 20 mA / 2-wire

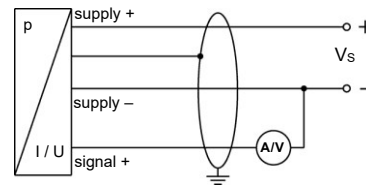
<sup>7</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar

### Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

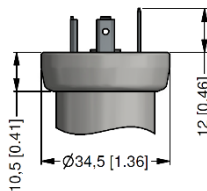


### Pin configuration

Electrical connection	ISO 4400	Binder 723, (5-pin)	M12x1 / metal, (4-pin)	field housing V <sub>+</sub> V <sub>-</sub> S+ GND	cable colours (DIN 47100)
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	⊥	ye/gn (yellow / green)

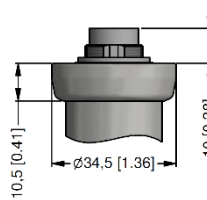
### Electrical connection (dimensions in mm)

standard

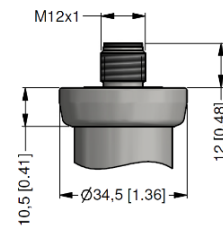


ISO 4400  
(IP 65)

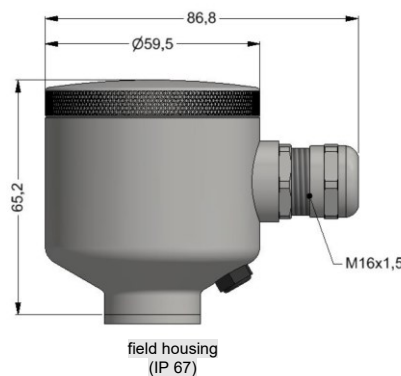
option



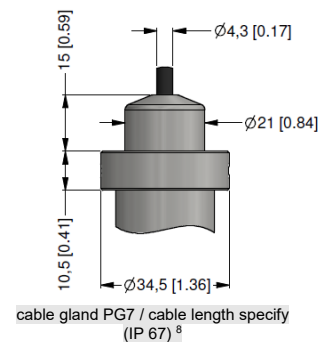
Binder Series 723 5-pin  
(IP 67)



M12x1 4-pin  
(IP 67)



field housing  
(IP 67)



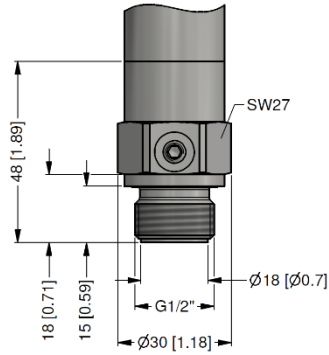
cable gland PG7 / cable length specify  
(IP 67)<sup>8</sup>

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

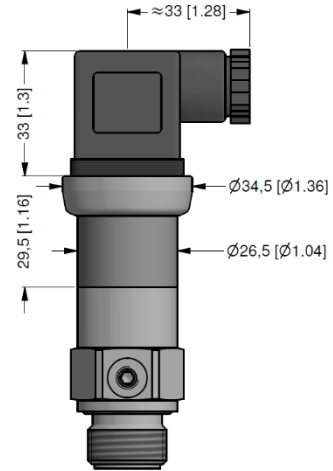
<sup>8</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)

## Mechanical connection (dimensions in mm)

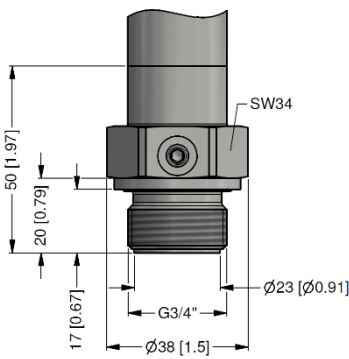
### standard



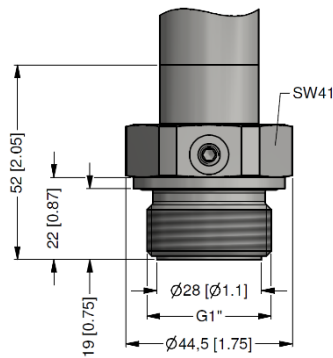
G 1 1/2" flush DIN 3852



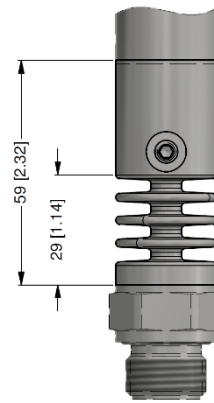
### option



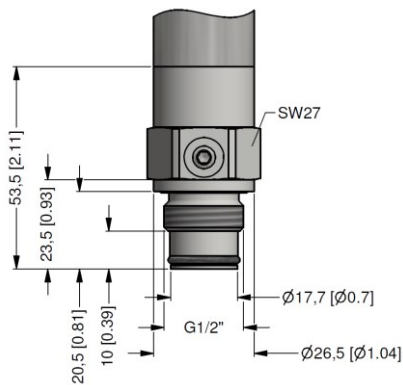
G3/4" flush DIN 3852



G1" flush DIN 3852



cooling element  
300 °C<sup>9</sup>



G1/2" flush  
with radial o-ring

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

<sup>9</sup> possible for nominal pressure ranges  $P_N \leq 160$  bar; max. temperature depends on the used sealing material, type of seal and installation

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

Ordering code DMK 331P

23.08.2024

DMK 331P

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<b>Pressure</b>																				
Gauge	5	0	5																	
Absolute (temperature max. 70 °C)	5	0	6																	
<b>Input [bar]</b>																				
0 ... 60				6	0	0	2													
0 ... 100				1	0	0	3													
0 ... 160				1	6	0	3													
0 ... 250				2	5	0	3													
0 ... 400				4	0	0	3													
Customer				9	9	9	9													
<b>Output</b>																				
4...20 mA / 2-wire																			1	
0...20 mA / 3-wire																			2	
0...10 V / 3-wire																			3	
0...5 V / 3-wire																			4	
4...20 mA / 3-wire																			7	
Intrinsic safety 4...20 mA / 2-wire																			E	
SIL2, 4 ... 20 mA / 2-wire																			1S	
SIL2, Intrinsic safety, 4 ... 20 mA / 2-wire																			ES	
Customer																			9	
<b>Accuracy</b>																				
1 %																			8	
0,5 % (standard)																			5	
1 % including Calibration Certificate																			U	
0,5 % including Calibration Certificate																			T	
Table of measured values for accuracy 0,5 %																			N	
Customer																			9	
<b>Electrical connection</b>																				
Connector DIN 43650 (ISO 4400) (IP 65)																			1	0
Connector Binder 723 5-pin (IP 67)																			2	0
Cable gland PG7 / cable length specify (IP 67)																			4	0
+ PVC cable / 1 m																				
Cable outlet, cable with ventilation tube (IP 68)																			T	R
+ PVC cable / 1 m																				
Connector Buccaneer (IP 68)																			5	0
Field housing stainless steel, cable gland M16 x 1,5 (IP 67)																			8	0
Field housing stainless steel, cable gland M20 x 1,5 (IP 67)																			8	8
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)																			E	0
Connector M12 x 1, 4-pin (IP 67)																			M	0
Connector M12 x 1, 4-pin (IP 67) - metal																			M	1
Customer																			9	9
<b>Mechanical connection</b>																				
G 1/2" DIN 3852 flush diaphragm																			Z	0
M 20 x 1,5 DIN 3852 flush diaphragm																			D	0
G 3/4" DIN 3852 flush diaphragm																			Z	3
G 1" DIN 3852 flush diaphragm																			Z	3
G 1/2" DIN 3852 with rad. o-ring and flush diaphragm																			Z	6
G 1 1/2" DIN 3852 flush diaphragm																			Z	3
G 1" DIN 3852 2x o-ring flush diaphragm																			Z	5
Customer																			9	9
<b>Diaphragm</b>																				
Stainless steel 1.4435 (316 L)																				1
Customer																				9
<b>Seals</b>																				
Viton (FKM) (P <sub>N</sub> < 100 bar)																				1
EPDM (P <sub>N</sub> < 160 bar)																				3
NBR (P <sub>N</sub> > 100 bar)																				5
FFKM (P <sub>N</sub> ≤ 100 bar)																				7
Customer																				9
<b>Filling Fluids</b>																				
Silicone oil																				1



Edible oil for foodstuff industry (temperature max. 150 °C)	2			
Customer	9			
<b>Special version</b>				
Standard		0	0	0
With cooling element from 125 °C up to 150 °C		1	5	0
With cooling element from 150 °C up to 300 °C (max. 200 °C permanent) <sup>1</sup>		2	0	0
Customer		9	9	9
3.1 Material certificate (membrane + pressure port)				
Custom temperature compensation (max. 70 bar and 200 °C)				

0,-...without additional charge

On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.

This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet.

BD SENSORS reserves the right to change sensor specifications without further notice.

1 only for  $P_N \leq 160$  bar possible

