

# DMK 331

## Industrial Pressure Transmitter

Ceramic Sensor

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



### Nominal pressure

from 0 ... 400 mbar up to 0 ... 600 bar

### Output signals

2-wire: 4 ... 20 mA

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

others on request

### Special characteristics

- ▶ pressure port G 1/2" flush for pasty and polluted media
- ▶ pressure port G 1/2" open port PVDF for aggressive media
- ▶ oxygen application





### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL 2  
according to IEC 61508 / IEC 61511
- ▶ customer specific versions

The industrial pressure transmitter DMK 331 with ceramic sensor has been especially designed for pasty, polluted or aggressive media and for oxygen applications at low pressure range.

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

### Preferred areas of use are

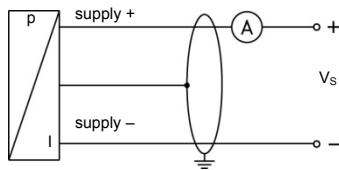
-  Plant and Machine Engineering
-  Energy Industry
-  Environmental Engineering  
(water - sewage - recycling)
-  Medical Technology



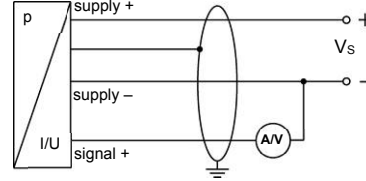
Input pressure range <sup>1</sup>																			
Nominal pressure gauge [bar]	-1...0	0,4	0,6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400	600	
Nominal pressure abs. [bar]	-	-	0,6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400	600	
Overpressure [bar]	4	1	2	2	4	4	10	10	20	40	40	100	100	200	400	400	600	800	
Burst pressure ≥ [bar]	7	2	4	4	5	7,5	12	18	30	50	50	120	180	300	500	750	1000	1100	
Vacuum resistance	P <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance										P <sub>N</sub> < 1 bar: on request								
<sup>1</sup> PVDF pressure port possible for nominal pressure ranges up to 60 bar																			
<sup>2</sup> nominal pressure 600 bar without UL certification																			
Output signal / Supply																			
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 8 ... 32 V <sub>DC</sub>								SIL-version: V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>										
Option IS-protection	2-wire: 4 ... 20 mA / V <sub>S</sub> = 10 ... 28 V <sub>DC</sub>								SIL-version: V <sub>S</sub> = 14 ... 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>	≤ ± 0.5 % span																		
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 % span / 10 V										load: 0.05 % span / kΩ								
Long term stability	≤ ± 0.3 % span / year at reference conditions																		
Response time	2-wire: ≤ 10 msec										3-wire: ≤ 3 msec								
<sup>2</sup> accuracy according to EN IEC 62828-2- limit point adjustment (non-linearity, hysteresis, repeatability)																			
Thermal effects (Offset and Span) / Permissible Temperatures																			
Thermal error	≤ ± 0.2 % span / 10 K																		
in compensated range	-25 ... 85 °C																		
Permissible temperatures <sup>3</sup>	medium: -40 ... 125 °C						electronics / environment: -40 ... 85 °C						storage: -40 ... 100 °C						
<sup>3</sup> for pressure port of PVDF the operation medium temperature is -30 ... 60 °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	10 g RMS (25 ... 2000 Hz)								according to DIN EN 60068-2-6										
Shock	500 g / 1 msec								according to DIN EN 60068-2-27										
Materials																			
Pressure port	standard: stainless steel 1.4404 (316 L) optional for G1/2" open port with nominal pressure range up to 60 bar: PVDF others on request																		
Housing	stainless steel 1.4404 (316 L)																		
Option field housing	stainless steel 1.4301 (304) with cable gland M16x 1.5 brass, nickel plated (clamping range 2...8 mm)																		
Seals (media wetted)	standard: FKM						options: EPDM (for P <sub>N</sub> ≤ 160 bar), NBR						others on request						
Diaphragm	ceramic Al <sub>2</sub> O <sub>3</sub> 96 %																		
Media wetted parts	pressure port, seals, diaphragm																		
Explosion protection (only for 4 ... 20 mA / 2-wire)																			
Approval DX9-DMK 331	<b>IBExU10ATEX1122 X</b> stainless steel pressure port: zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 135°C Da plastic pressure port: zone 1: II 2G Ex ia IIC T4 Gb zone 21: II 2D Ex ia IIIC T 85°C Db																		
Safety technical maximum values	U <sub>i</sub> = 28 V <sub>DC</sub> , I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈ 0 μH, 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 <sub>atm</sub> 0.8 bar up to 1.1 bar in zone 1 or higher: -40/-20 ... 70 °C (lower temperature limit depends on the type of cable used)																		
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																		
Miscellaneous																			
Option SIL <sup>4</sup> 2	according to IEC 61508 / IEC 61511																		
Option oxygen application	for P <sub>N</sub> ≤ 15 bar: O-ring in 70 EPDM 281 (with BAM-approval); permissible maximum values are 15 bar / 60° C and 10 bar / 90° C for P <sub>N</sub> ≤ 25 bar: O-ring in FKM Vi 567 (with BAM-approval); permissible maximum values are 25 bar / 150° C																		
Current consumption	signal output current: max. 25 mA								signal output voltage: max. 7 mA										
Weight	approx. 140 g																		
Installation position	any																		
Operational life	100 million load cycles																		
CE-conformity	EMC Directive: 2014/30/EU								Pressure Equipment Directive: 2014/68/EU (module A) <sup>5</sup>										
ATEX Directive	2014/34/EU																		
<sup>4</sup> only for 4 ... 20 mA / 2-wire																			
<sup>5</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)

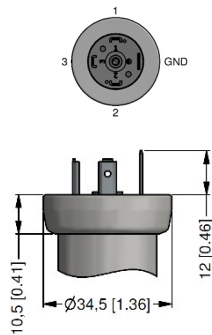


### Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing 	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		gye (green-yellow)

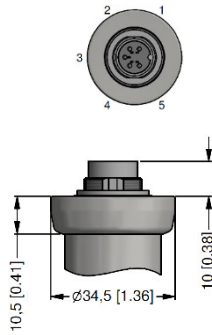
### Electrical connections (dimensions in mm)

#### standard

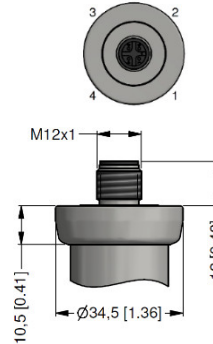


ISO 4400  
(IP 65)

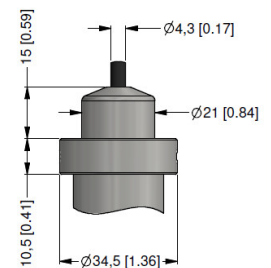
#### option



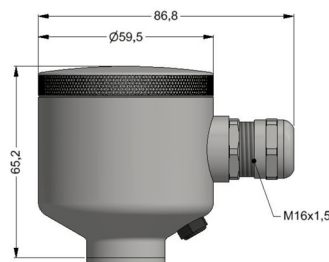
Binder Series 723 5-pin  
(IP 67)



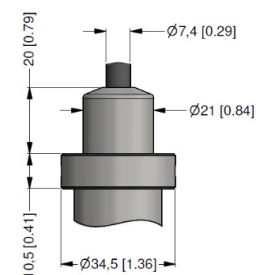
M12x1 4-pin  
(IP 67)



cable gland PG7 / cable length specify  
(IP 67)<sup>6</sup>



field housing  
(IP 67)



cable outlet,  
cable with ventilation tube  
(IP 68)<sup>7</sup>

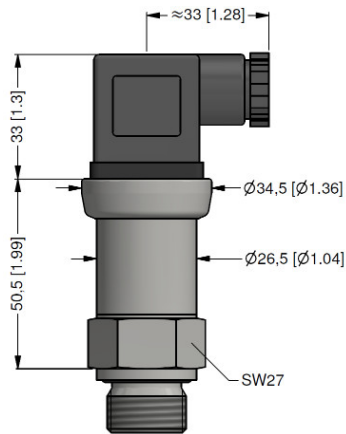
⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request

<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

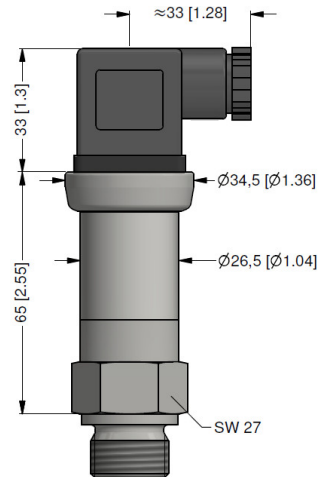
**Mechanical connection (dimensions in mm)**

**standard**



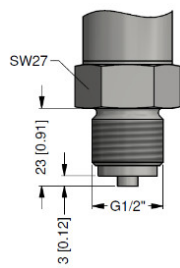
G1/2" DIN 3852 with ISO 4400

**standard for SIL- and SIL-IS-version**

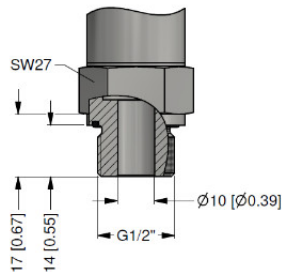


G1/2" DIN 3852 with ISO 4400

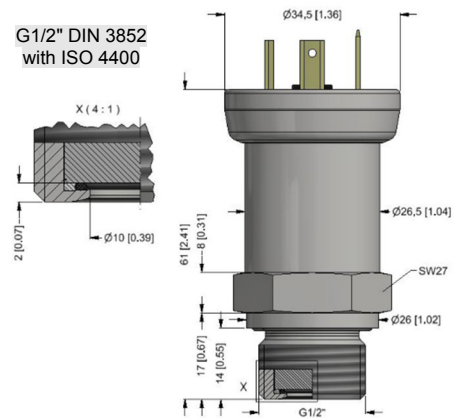
**option**



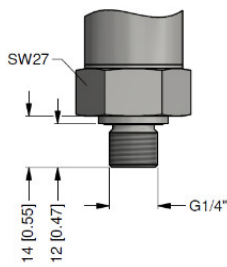
G1/2" EN 837



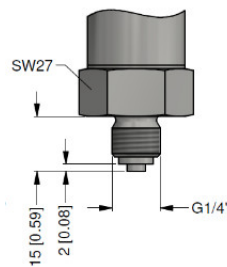
G1/2" open port



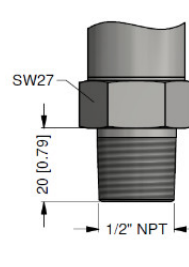
G1/2" semi-flush DIN 3852; M20x1.5<sup>8</sup>



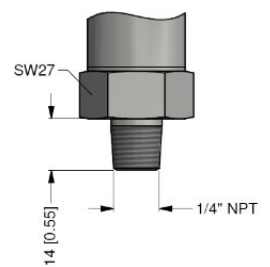
G1/4" DIN 3852



G1/4" EN 837



1/2" NPT



1/4" NPT

⇒ metric threads and other versions on request

<sup>8</sup> possible for nominal pressure ranges  $P_N \leq 25$  bar; absolute pressure ranges on request

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



G 1/2" EN 837	2	0	0						
G 1/4" DIN 3852	3	0	0						
G 1/4" EN 837	4	0	0						
M 20 x 1,5 DIN 3852	5	0	0						
M 20 x 1,5 EN 837	8	0	0						
G 1/2" DIN 3852 with flush sensor diaphragm (P <sub>N</sub> ≤ 25 bar) <sup>3</sup>	F	0	0						
1/2" NPT	N	0	0						
1/4" NPT	N	4	0						
G 1/2" DIN 3852 open (max. 400 bar)	H	0	0						
M 20 x 1,5 DIN 3852 open (max. 400 bar)	H	0	5						
Customer	9	9	9						
<b>Seals</b>									
Viton (FKM)				1					
EPDM (P <sub>N</sub> < 160 bar)				3					
NBR				5					
Customer				9					
<b>Pressure port</b>									
Stainless steel 1.4404 (316 L)					1				
PVDF (P <sub>N</sub> ≤ 60 bar) only with G 1/2" DIN 3852 open port H00 <sup>4</sup>					B				
Customer					9				
<b>Diaphragm</b>									
Ceramics Al <sub>2</sub> O <sub>3</sub> 96 %						2			
Ceramics Al <sub>2</sub> O <sub>3</sub> 96 % with a PTFE foil (Accuracy 1%)- not possible used for underpressure						3			
Customer						9			
<b>Special version</b>									
Standard							0	0	0
Version for oxygen (Viton o-rings, max. 25 bar)							0	0	7
Customer							9	9	9

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 code TR0 = PVC cable, cable with ventilation tube available in different types and lengths; cable not included in the price

2 metric threads and others on request

3 possible for nominal pressure ranges P<sub>N</sub> ≤ 25 bar; absolute pressure ranges on request

4 PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar); permissible medium temperature: -30 ... 60 °C



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

