DMK 331

Industrial Pressure Transmitter

Ceramic Sensor

accuracy according to IEC 60770:
0.5 % FSO

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

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Input pressure range [1]																		
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 absolute [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	75	120	180	300	500	750	1000	1100
Vacuum resistance	p_N ≥ 1 bar: unlimited vacuum resistance										p_N < 1 bar: on request							
[1] PVDF pressure port possible for nominal pressure ranges up to 60 bar																		

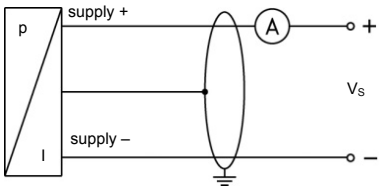
Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V_S = 8 ... 32 V_{DC}	SIL-version: V_S = 14 ... 28 V_{DC}
Option IS-protection	2-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC}	SIL-version: V_S = 14 ... 28 V_{DC}
Options 3-wire	3-wire: 0 ... 20 mA / V_S = 14 ... 30 V_{DC} 0 ... 10 V / V_S = 14 ... 30 V_{DC}	
Performance		
Accuracy [2]	≤ ± 0.5 % FSO	
Permissible load	current 2-wire: $R_{max} = [(V_S – V_{S\ min}) / 0.02\ A]\ \Omega$ current 3-wire: R_{max} = 240 Ω voltage 3-wire: R_{min} = 10 kΩ	
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	
[2] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)		
Thermal effects (Offset and Span)		
Thermal error	≤ ± 0.2 % FSO / 10 K	
in compensated range	-25 ... 85 °C	
Permissible temperatures		
Permissible temperatures [3]	medium: -40 ... 125 °C electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C	
[3] for pressure port in PVDF the 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 compact field housing	stainless steel 1.4301 (304); cable gland M12x1.5, brass, nickel plated (clamping range 2 … 8 mm)	
Seals	standard: FKM option: EPDM (for p_N ≤ 160 bar) others on request	
Diaphragm	ceramic Al_2O_3 96 %	
Media wetted parts	pressure port, seals, diaphragm	
Explosion protection (only for 4 … 20 mA / 2-wire)		
Approval DX19-DMK 331	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X stainless steel pressure port: zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da plastic pressure port: zone 1: II 2G Ex ia IIC T4 Gb zone 21: II 2D Ex ia IIIC T85°C Db	
Safety technical maximum values	U_i = 28 V_{DC}, I_i = 93 mA, P_i = 660 mW, C_i ≈ 0 nF, L_i ≈ 0 µH, 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: 1µH/m	

Miscellaneous		
Option SIL2 version [4]	according to IEC 61508 / IEC 61511	
Option oxygen application	for $p_N \leq 25$ 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) [5]
ATEX Directive	2014/34/EU	

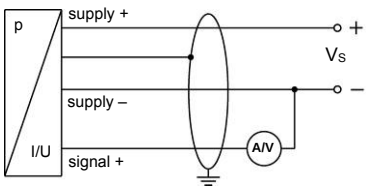
[4] only for 4 … 20 mA / 2-wire
[5] this directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

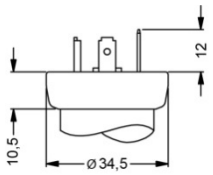


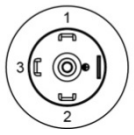
Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	compact 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 connections (dimensions in mm)

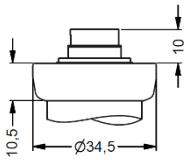
standard

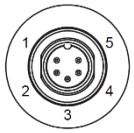




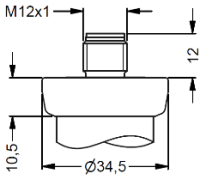
ISO 4400
(IP 65)

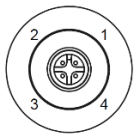
options



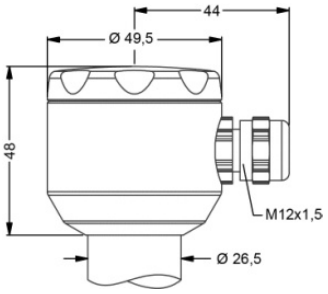


Binder Series 723, 5-pin
(IP 67)

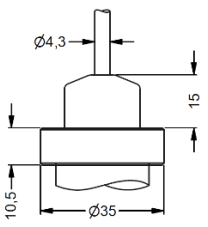




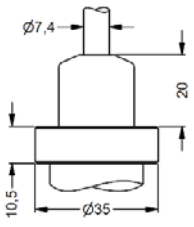
M12x1, 4-pin
(IP 67)



compact field housing
(IP 67)



cable outlet with PVC cable
(IP 67) [6]



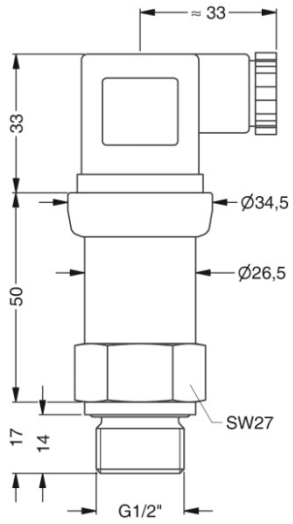
cable outlet, cable with
ventilation tube (IP 68) [7]

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

[6] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)
[7] different cable types and lengths available, permissible temperature depends on kind of cable

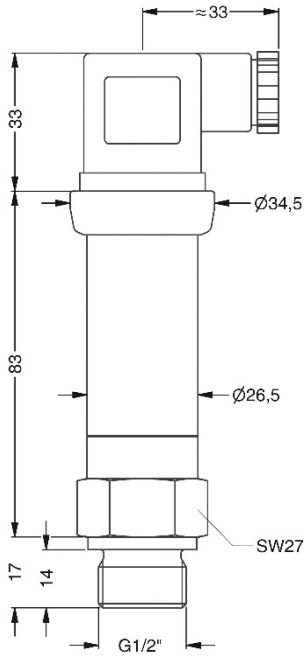
Mechanical connection (dimensions in mm)

standard



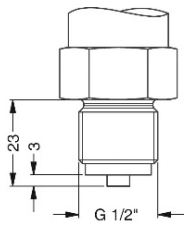
G1/2" DIN 3852
with ISO 4400

standard for SIL- and SIL-IS-version

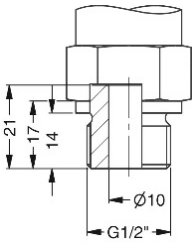


G1/2" DIN 3852
with ISO 4400

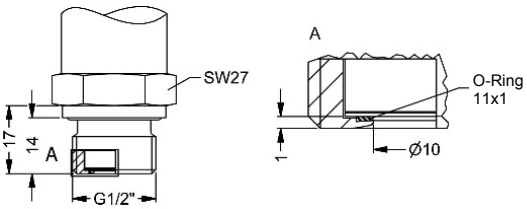
options



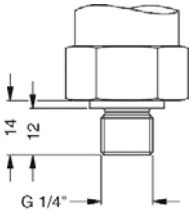
G1/2" EN 837



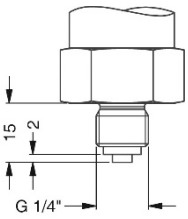
G1/2" open port



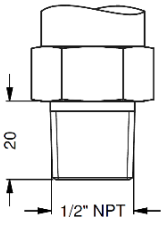
G1/2" semi-flush DIN 3852 [8]



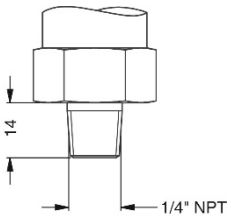
G1/4" DIN 3852



G1/4" EN 837



1/2" NPT



1/4" NPT

⇨ **metric threads and other versions on request**

[8] *possible for nominal pressure ranges p_N ≤ 25 bar; absolute pressure ranges on request*

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BD|SENSORS pressure measurement

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pressure measurement

Ordering code DMK 331

DMK 331 □□□-□□□□-□-□-□□□-□□□-□-□-□-□□□

Pressure		
gauge	250	
absolute	251	
Input	**[bar]**	
0.4	4000	
0.6	6000	
1.0	1001	
1.6	1601	
2.5	2501	
4.0	4001	
6.0	6001	
10	1002	
16	1602	
25	2502	
40	4002	
60	6002	
100	1003	
160	1603	
250	2503	
400	4003	
600	6003	
-1 … 0	X102	
customer	9999	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		
0.5 % FSO	5	
customer	9	consult
Electrical connection		
male and female plug ISO 4400	100	
male plug Binder series 723 (5-pin)	200	
cable outlet with PVC cable (IP67) [1]	TA0	
cable outlet, cable with ventilation tube (IP68) [2]	TR0	
male plug M12x1 (4-pin) / metal	M10	
compact field housing stainless steel 1.4301 (304)	850	
customer	999	consult
Mechanical connection [3]		
G1/2" DIN 3852	100	
G1/2" EN 837	200	
G1/4" DIN 3852	300	
G1/4" EN 837	400	
G1/2" DIN 3852 with semi-flush sensor [4]	F00	
G1/2" DIN 3852 open pressure port	H00	
1/2" NPT	N00	
1/4" NPT	N40	
customer	999	consult
Seals		
FKM	1	
EPDM [5]	3	
customer	9	consult
Pressure port		
stainless steel 1.4404 (316L)	1	
PVDF [6]	B	
customer	9	consult
Diaphragm		
ceramics Al_2O_3 96 %	2	
customer	9	consult
Special version		
standard	000	
oxygen application [7]	007	
customer	999	consult

[1] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request
[2] code TR0 = PVC cable, cable with ventilation tube available in different types and lengths
[3] metric threads and others on request
[4] possible for nominal pressure ranges $p_N \leq 25$ bar; absolute pressure ranges on request
[5] possible for nominal pressure ranges $p_N \leq 160$ bar
[6] PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar); permissible medium temperature: -30 … 60 °C
[7] oxygen application with FKM-seal up to 25 bar possible

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