DMK 331

Industrial Pressure Transmitter

Ceramic Sensor

accuracy according to IEC 60770:
0.5 % FSO

DMK 331 Industrial Pressure Transmitter

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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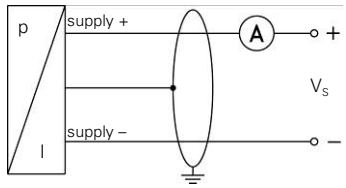
Input pressure range [1]																		
Nominal pressure gauge [bar]	-1...0	0.4	0.6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400	600
Nominal pressure abs. [bar]	-	-	0.6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400	600
Overpressure [bar]	4	1	2	2	4	4	10	10	20	40	40	100	100	200	400	400	600	800
Burst pressure ≥ [bar]	7	2	4	4	5	5	12	12	25	50	50	120	120	250	500	500	650	880
Vacuum resistance	$P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request																	
[1] PVDF pressure port possible for nominal pressure ranges up to 60 bar																		

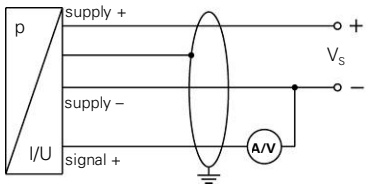
Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 8 ... 32 V_{DC}
Option IS-protection	2-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC}
Options 3-wire	3-wire: 0 ... 20 mA / V_S = 14 ... 30 V_{DC} 0 ... 10 V / V_S = 14 ... 30 V_{DC}
Performance	
Accuracy [2]	≤ ± 0.5 % FSO
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S\ min}) / 0.02]\ \Omega$ 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	≤ ± 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) / Permissible Temperatures	
Thermal error	≤ ± 0.2 % FSO / 10 K
in compensated range	-25 ... 85 °C
Permissible temperatures	medium: -40 ... 125 °C electronics / environment: -40 ... 85 °C storage: -40 ... 100 °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 1.4305 (303) with cable gland brass, nickel plated others on request
Seals (media wetted)	standard: FKM options: EPDM (for $P_N \leq 160$ bar), NBR others on request
Diaphragm	ceramic Al_2O_3 96 %
Media wetted parts	pressure port, seals, diaphragm
Explosion protection (with option IS-protection)	
Approval DX19-DMK 331	IBExU 10 ATEX 1068 X stainless steel pressure port: zone 0: II 1G Ex ia IIC T4 Ga zone 20 : II 1D Ex iaD 20 T 85°C, IP6x **in preparation** plastic pressure port: zone 1: II 2G Ex ia IIC T4 Ga zone 21: II 2D Ex tD A21 IP6x T 85°C **in preparation**
Safety technical maximum values	$U_i = 28\ V_{DC}$, $I_i = 93$ mA, $P_i = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ µH
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: -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
Miscellaneous	
Option SIL 2	according to IEC 61508 / IEC 61511
Option oxygen application	for $P_N \leq 25$ bar: O-ring in special material with oxygen-approval (FKM)
Current consumption	signal output current: max. 25 mA signal output voltage: typ. 5 mA
Weight	approx. 140 g
Installation position	any
Operational life	> 100 x 10^6 pressure cycles
CE-conformity	EMC Directive: 2004/108/EC Pressure Equipment Directive: 97/23/EC (module A) [3]
[3] This directive is only valid for devices with maximum permissible overpressure > 200 bar	

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

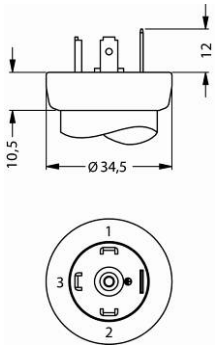


Pin configuration

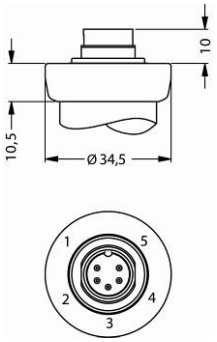
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colours (DIN 47100)
Supply +	1	3	1	IN +	wh (white)
Supply –	2	4	2	IN -	bn (brown)
Signal + (for 3-wire)	3	1	3	OUT+	gn (green)
Shield	ground pin	5	4	⏚	gn/ye (green / yellow)

Electrical connections (dimensions in mm)

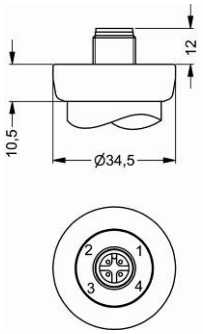
standard **option**



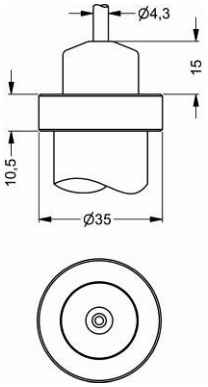
ISO 4400
(IP 65)



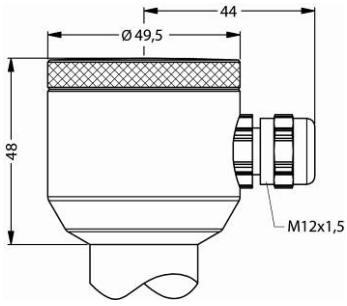
Binder Series 723 5-pin
(IP 67)



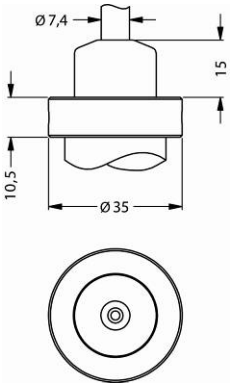
M12x1 4-pin
(IP 67)



cable outlet with PVC cable
(IP 67) [4]



compact field housing
(IP 67)



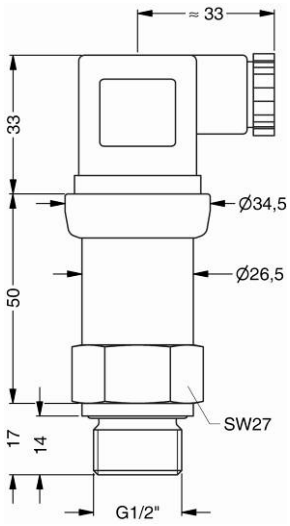
cable outlet,
cable with ventilation tube
(IP 68) [5]

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

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

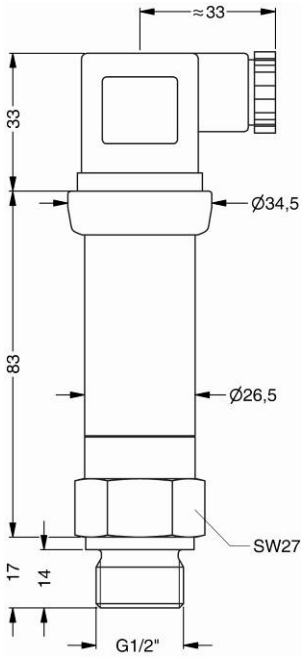
Mechanical connection (dimensions in mm)

standard



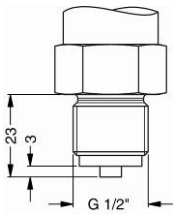
G1/2" DIN 3852
with ISO 4400

standard for SIL- and SIL-IS-version

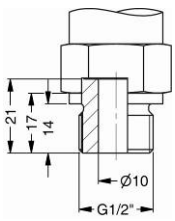


G1/2" DIN 3852
with ISO 4400

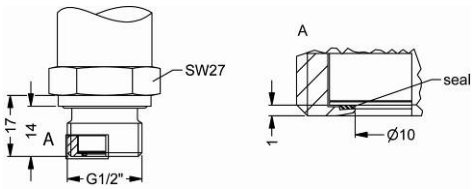
option



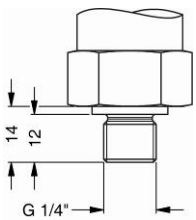
G1/2" EN 837



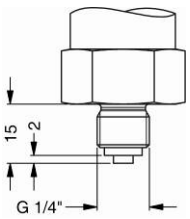
G1/2" open port



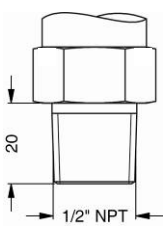
G1/2" semi-flush DIN 3852; M20x1.5 [6]



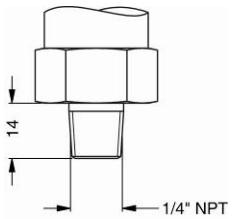
G1/4" DIN 3852



G1/4" EN 837



1/2" NPT



1/4" NPT

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

[6] *possible for nominal pressure ranges $P_N \leq 25$ bar; absolute pressure ranges on request*

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BD SENSORS® pressure measurement

Ordering code DMK 331

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

Pressure																							
gauge	2	5	0																				
absolute	2	5	1																				
Input	[bar]																						
0.40				4	0	0	0																
0.60				6	0	0	0																
1.0				1	0	0	1																
1.6				1	6	0	1																
2.5				2	5	0	1																
4.0				4	0	0	1																
6.0				6	0	0	1																
10				1	0	0	2																
16				1	6	0	2																
25				2	5	0	2																
40				4	0	0	2																
60				6	0	0	2																
100				1	0	0	3																
160				1	6	0	3																
250				2	5	0	3																
400				4	0	0	3																
600				6	0	0	3																
-1 ... 0				X	1	0	2																
customer				9	9	9	9																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 %									5														
customer									9														consult
Electrical connection																							
Male and female plug ISO 4400										1	0	0											
Male plug Binder series 723 (5-pin)										2	0	0											
Cable outlet with PVC cable [1]										T	A	0											
Cable outlet with cable										T	R	0											
Male plug M12x1 (4-pin) / metal										M	1	0											
compact field housing stainless steel 1.4404 (316L)										8	5	0											
customer										9	9	9											consult
Mechanical connection [2]																							
G1/2" DIN 3852													1	0	0								
G1/2" EN 837													2	0	0								
G1/4" DIN 3852													3	0	0								
G1/4" EN 837													4	0	0								
G1/2" DIN 3852 with semi-flush sensor [3]													F	0	0								
G1/2" DIN 3852 open pressure port													H	0	0								
1/2" NPT													N	0	0								
1/4" NPT													N	4	0								
customer													9	9	9								consult
Seals																							
FKM																1							
EPDM																3							
NBR																5							
customer																9							consult
Pressure port																							
Stainless steel 1.4404 (316L)																	1						
PVDF [4]																	B						
customer																	9						consult
Diaphragm																							
Ceramics Al_2O_3 96%																		2					
customer																		9					consult
Special version																							
standard																			0	0	0		
oxygen application [5]																			0	0	7		
customer																			9	9	9		consult

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

[2] metric threads and others on request

[3] possible for nominal pressure ranges $P_N \leq 25$ bar; absolute pressure ranges on request

[4] PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar)

[5] oxygen application possible up to 25 bar and only with FKM-seal

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