BD SENSORS®
pressure measurement

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

BD SENSORS s.r.o.
Hradišťská 817
CZ – 687 08 Buchlovice
Tel.: +420 572 411 011
www.bdsensors.cz
info@bdsensors.cz

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

Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / VS = 8 ... 32 VDC	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 [1]	≤ ± 0.5 % FSO	
Permissible load	current 2-wire: $R_{max} = [(V_S – V_{S\ min}) / 0.02\ A]\ \Omega$ current 3-wire: R_{max} = 500 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	
[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 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 300°C	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
[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	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 ≤ 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 ≤ 100 bar		
Explosion protection (only for 4 … 20 mA / 2-wire)		
Approvals DX9-DMK 331P	**IBExU10ATEX1122 X** 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 ≈ 0 nF, L_i ≈ 0 µH	
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: 1µH/m	

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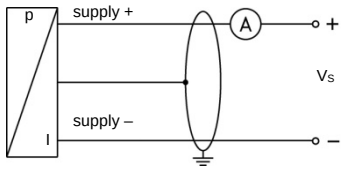
Miscellaneous	
Option SIL 2 [5]	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	min. 200 g (depending on process connection)
Installation position	any (standard calibration in a vertical position with the pressure port connection down
Operational life	> 100 x 10^6 pressure cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) [6]
ATEX Directive	2014/34/EU

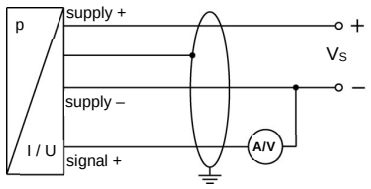
[5] only for 4 … 20 mA / 2-wire
[6] This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

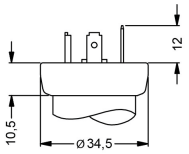


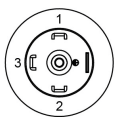
Pin configuration

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

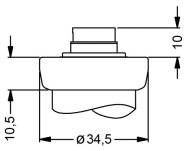
standard

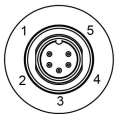




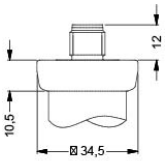
ISO 4400
(IP 65)

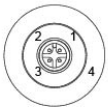
option



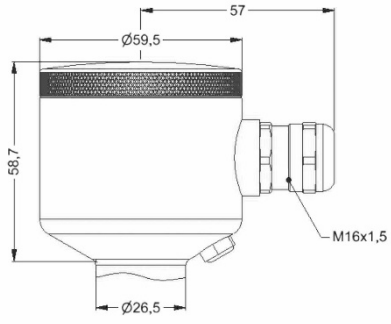


Binder Series 723 5-pin
(IP 67)

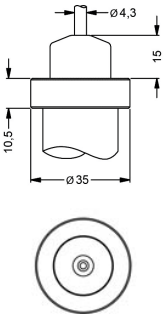




M12x1 4-pin
(IP 67)



field housing
(IP 67)



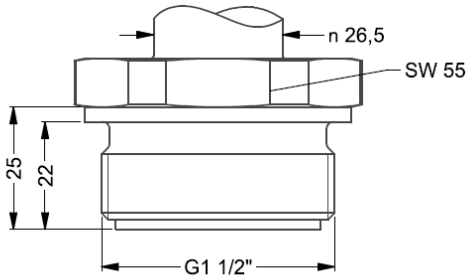
cable outlet with PVC cable
(IP 67) [7]

⇨ **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)

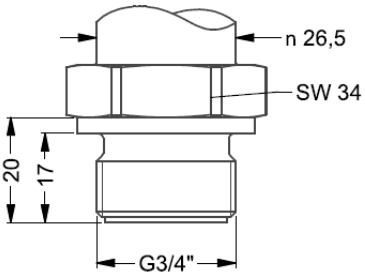
Mechanical connection (dimensions in mm)

standard

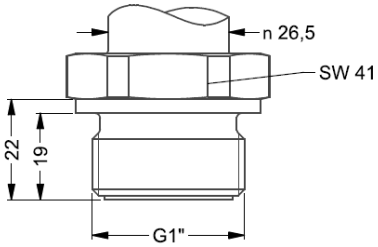


G1/2" flush DIN 3852

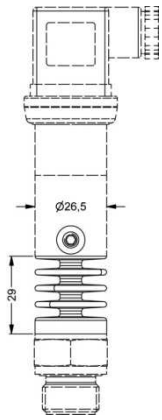
option



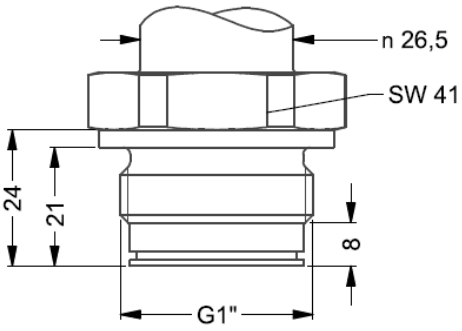
G3/4“ flush DIN 3852



G1“ flush DIN 3852



cooling element
300 °C [8]



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**

[8] *possible for nominal pressure ranges $P_N \leq 160$ bar*

Tel.: +420 572 411 011
www.bdsensors.cz
info@bdsensors.cz
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Ordering code DMK 331P

3.4.2020

DMK 331P ☐☐☐-☐☐☐☐-☐-☐-☐☐☐-☐☐☐-☐-☐-☐-☐☐☐

Pressure								
Gauge	5 0 5							
Absolute (temperature max. 70°C)	5 0 6							
Input [bar]								
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						
Output								
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					
Accuracy								
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				
Electrical connection								
Connector DIN 43650 (ISO 4400) (IP 65)					1 0 0			
Connector Binder 723 5-pin (IP 67)					2 0 0			
Cable gland PG7 / cable length specify (IP 67)					4 0 0			
+ PVC cable / 1 m								
Cable outlet, cable with ventilation tube (IP68)					T R 0			
+ PVC cable / 1 m								
Connector Buccaneer (IP 68)					5 0 0			
Field housing stainless steel, cable gland M16 x 1,5 (IP 67)					8 0 0			
Field housing stainless steel, cable gland M20 x 1,5 (IP 67)					8 8 0			
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)					E 0 0			
Connector M12 x 1, 4-pin (IP 67)					M 0 0			
Connector M12 x 1, 4-pin (IP 67) - metal					M 1 0			
Customer					9 9 9			
Mechanical connection								
G 1/2" DIN 3852 flush diaphragm						Z 0 0		
M 20 x 1,5 DIN 3852 flush diaphragm						D 0 4		
G 3/4" DIN 3852 flush diaphragm						Z 3 0		
G 1" DIN 3852 flush diaphragm						Z 3 1		
G 1/2" DIN 3852 with rad. o-ring and flush diaphragm						Z 6 1		
G 1 1/2" DIN 3852 flush diaphragm						Z 3 3		
G 1" DIN 3852 2x o-ring flush diaphragm						Z 5 7		
Customer						9 9 9		
Diaphragm								
Stainless steel 1.4435 (316 L)							1	
Customer							9	
Seals								
Viton (FKM) (P_N < 100 bar)								1
EPDM (P_N < 160 bar)								3
NBR (P_N > 100 bar)								5
FFKM ($P_N \leq$ 100 bar)								7
Customer								9

BD SENSORS s.r.o.
Hradišťská 817
CZ – 687 08 Buchlovice
Tel.: +420 572 411 011
Fax: +420 572 411 497
www.bdsensors.cz
info@bdsensors.cz

Filling Fluids					
Silicone oil	1				
Edible oil for foodstuff industry (temperature max. 150°C)	2				
Customer	9				
Special version					
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 (P_N ≤ 70 bar max. 200°C permanent)		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.

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