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

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Input pressure range						
Nominal pressure gauge / abs.	[bar]	60	100	160	250	400
Overpressure	[bar]	100	200	400	400	600
Burst pressure ≥	[bar]	180	300	500	750	1000

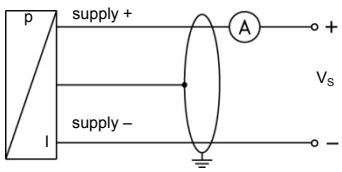
Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / VS = 8 ... 32 VDC SIL-version: V_S = 14 … 28 V_{DC}
Option IS-protection	2-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC} SIL-version: V_S = 14 … 28 V_{DC}
Options 3-wire	3-wire: 0 ... 20 mA / V_S = 14 ... 30 V_{DC} 0 ... 10 V / V_S = 14 ... 30 V_{DC}
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 silicone 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 silicone 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	silicone 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 1.4435 (316 L)
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 Option	 FKM (recommended for medium temperatures ≤ 200 °C) FFKM (recommended for medium temperatures > 200 °C) others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm
Explosion protection (only for 4 … 20 mA / 2-wire)	
Approvals DX 19 - DMK 331P	**IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X** zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da, IP65
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i ≈ 0 nF, L_i ≈ 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: 1µH/m

Miscellaneous	
Option SIL[4] 2	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) [5]
ATEX Directive	2014/34/EU

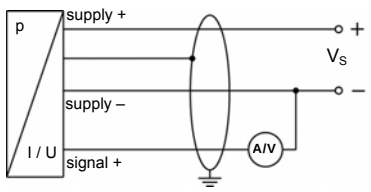
[4] only for 4 … 20 mA / 2-wire
[5] This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)

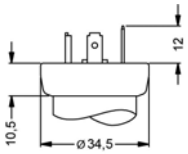


Pin configuration

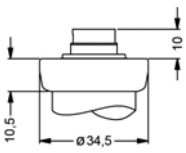
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colour (IEC 60757)
Supply +	1	3	1	IN +	wh (white)
Supply –	2	4	2	IN –	bn (brown)
Signal + (only for 3-wire)	3	1	3	OUT +	gn (green)
Shield	ground pin	5	4	⏚	gnye (green-yellow)

Electrical connection (dimensions in mm)

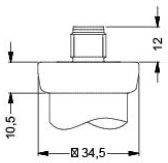
standard **option**

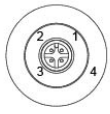


ISO 4400
(IP 65)

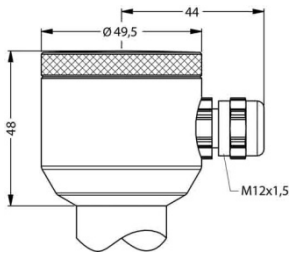


Binder Series 723 5-pin
(IP 67)

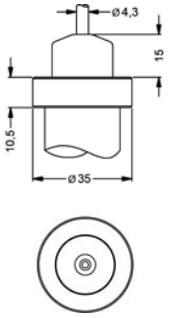




M12x1 4-pin
(IP 67)



compact field housing
(IP 67)



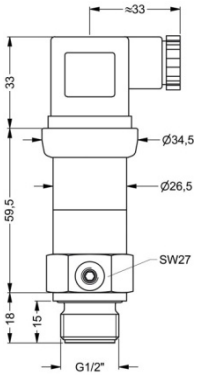
cable outlet with PVC cable
(IP 67) [6]

⇨ **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)

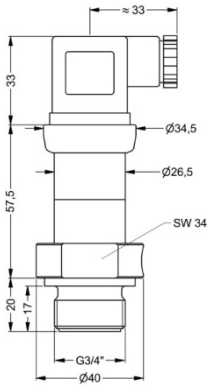
Mechanical connection (dimensions in mm)

standard

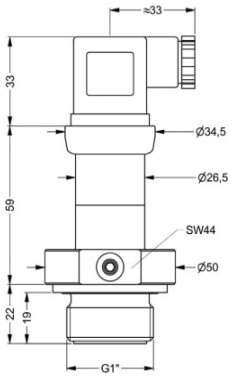


G1/2" flush DIN 3852

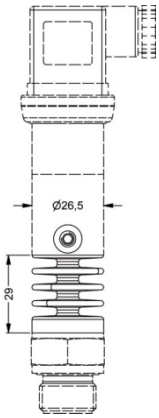
option



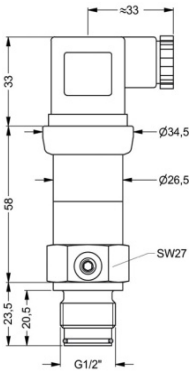
G3/4“ flush DIN 3852



G1“ flush DIN 3852



cooling element
300 °C [7]



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**

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

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BD|SENSORS pressure measurement

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Ordering code DMK 331P

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Pressure		
gauge	5 0 5	
absolute	5 0 6	
Input [bar]		
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	
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	
Male plug M12x1 (4-pin) / metal	M 1 0	
compact field housing stainless steel 1.4305	8 5 0	
customer	9 9 9	consult
Mechanical connection		
G1/2" DIN 3852 with flush diaphragm	Z 0 0	
G3/4" DIN 3852 with flush diaphragm	Z 3 0	
G1" DIN 3852 with flush diaphragm	Z 3 1	
G 1/2" DIN 3852 with rad. o-ring and flush diaphragm	Z 6 1	
customer	9 9 9	consult
Diaphragm		
Stainless steel 1.4435 (316L)	1	
customer	9	consult
Seals		
FKM	1	
FFKM [2]	7	
customer	9	consult
Filling Fluids		
Silicone oil	1	
food compatible oil	2	
customer	9	consult
Special version		
standard	0 0 0	
with cooling element up to 300°C [3]	2 0 0	
customer	9 9 9	consult

standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 … 70°C)
only for P_N ≤ 100 bar possible
only for P_N ≤ 160 bar possible

01.10.2013