



DMK 331 P

Pressure Transmitter with Flush Stainless Steel Diaphragm

- ▶ ceramic sensor
- ▶ for viscous and pasteous media
- ▶ accuracy:
0.25 % FSO BFSL
(0.5 % FSO IEC 60770)
- ▶ nominal pressure ranges from
0 ... 1 bar up to 0 ... 400 bar

The DMK 331 P is a pressure transmitter for process measurement. Because of its flush diaphragm the DMK 331 P is suited for viscous media and gases, which are compatible stainless steel 1.4435 (316L) and sealing material.

Basic element of the DMK 331 P is a ceramic sensor, which features small thermal effect, good linearity and long term stability. Different filling fluids are available: besides silicon oil, food compatible oil, and Halocarbon; others are available on request.

For usage at higher temperatures a cooling element can be delivered optionally. Different output signals and electrical connections make the DMK 331 P covering a wide field of applications. Additional the pressure transmitter can be used in explosive area.

Preferred areas of use are:

- ▶ process engineering
- ▶ chemical industry
- ▶ food industry
- ▶ paper industry

- ▶ small thermal effect
- ▶ good linearity
- ▶ good long term stability
- ▶ option Ex version:
(only for 4 ... 20 mA / 2-wire)
TÜV 03 ATEX 2006 X
- ▶ customer specific versions:
 - variety of electrical and mechanical connections
 - other versions on request

Characteristics



DMK 331 P
Flush Pressure Transmitter

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Technical Data

Input pressure range ¹																
Nominal pressure gauge [bar]	-1...0 ²	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	
Nominal pressure abs. ² [bar]	-	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	
Permissible overpressure [bar]	3	3	7	7	12	12	25	50	50	120	120	250	500	500	600	

Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / $V_s = 12 \dots 36 V_{DC}$	Ex-protection: $V_s = 14 \dots 28 V_{DC}$
Optional	3-wire: 0 ... 20 mA / $V_s = 14 \dots 36 V_{DC}$ 0 ... 10 V / $V_s = 14 \dots 36 V_{DC}$	

Performance		
Accuracy	IEC 60770 ³ : $\leq \pm 0.5 \% \text{ FSO}$	BFSL: $\leq \pm 0.25 \% \text{ FSO}$
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 / k Ω	
Response time	< 10 msec	

Thermal effects (Offset and Span) ⁴	
Thermal error for offset and span	$\leq \pm 0.2 \% \text{ FSO} / 10 \text{ K}$
in compensated range	-25 ... 85 °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
Option Ex-protection only with 4 ... 20 mA / 2-wire DX13-DMK 331 P	zone 0 ⁵ : II 1 G EEx ia IIC T4 zone 20: II 1 D T 85°C safety technical maximum values: $V_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C_i \leq 1 \text{ nF}$, $L_i \leq 10 \mu\text{H}$

Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

Permissible temperatures		
Medium	-25 ... 135 °C ^{2,6}	
Electronics / environment	-25 ... 85 °C	Ex-protection: application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C
Storage	-40 ... 100 °C	

¹ pressure ranges $P_N < 1.6 \text{ bar}$ not possible with mechanical connection G1/2" flush

² for vacuum and nominal pressure abs the max. medium temperature is 70 °C

³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

⁴ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

⁵ approved for atmospheric pressure from 0.8 bar up to 1.1 bar

⁶ with optional cooling element its maximum permissible temperature is valid

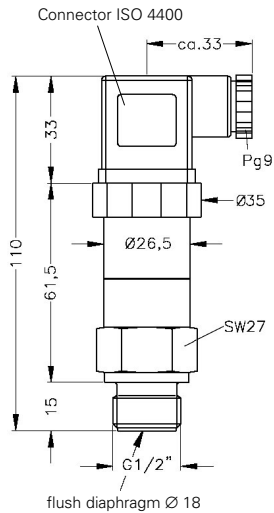
DMK 331 P

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Technical Data

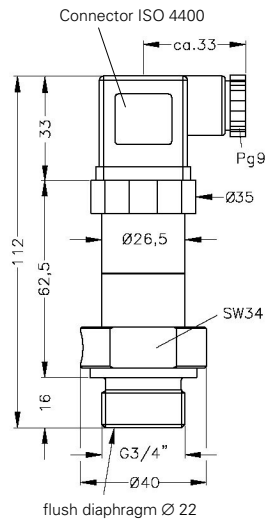
Mechanical connection (dimensions in mm)

Standard

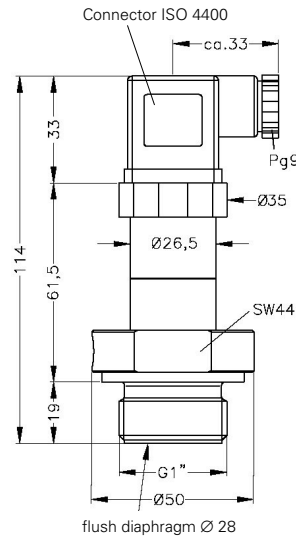


G1/2" flush¹
(DIN 3852)
M20x1.5

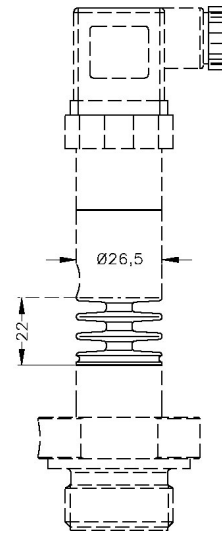
Optional



G3/4" flush
(DIN 3852)



G1" flush
(DIN 3852)

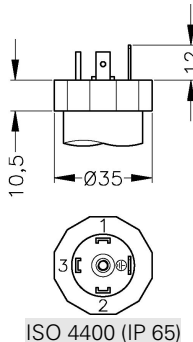


with cooling element
150 °C⁷

⇒ Ex-protection: total length increases by 26.5mm!

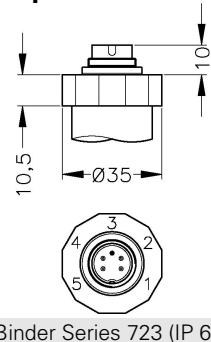
Electrical connection (dimensions in mm)

Standard

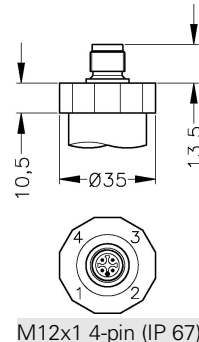


ISO 4400 (IP 65)

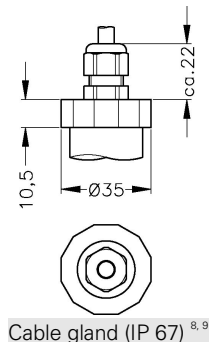
Optional



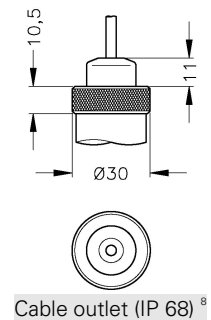
Binder Series 723 (IP 67)



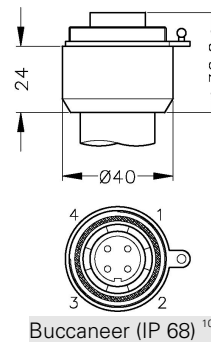
M12x1 4-pin (IP 67)



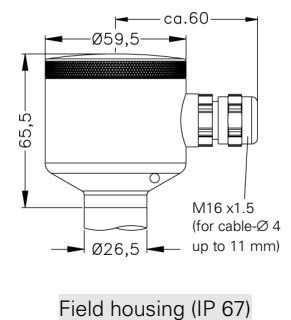
Cable gland (IP 67)^{8,9}



Cable outlet (IP 68)⁸



Buccaneer (IP 68)¹⁰



Field housing (IP 67)

⁷ for max. 100 bar

⁸ different cable types and lengths available

⁹ standard: 2m PVC cable without ventilation tube, optionally cable with ventilation tube

¹⁰ for gauge pressure up to 40 bar cable with ventilation tube required

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Technical Data

Filling Fluids

Standard	Silicon oil
Optional	food compatible oil (with FDA-approval) / Halocarbon and others on request

Materials

Pressure port	stainless steel 1.4571 (316Ti)
Housing	stainless steel 1.4301 (304) / field housing: 1.4305 (303), cable gland: brass, nickel plated
Seals (media wetted)	$P_N < 100$ bar: FKM / $P_N \geq 100$ bar: NBR / others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

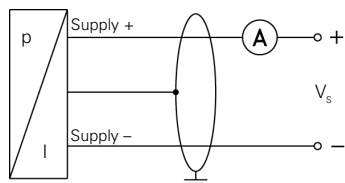
Optionally SIL 2 application	according to IEC 61508 / IEC 61511
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μ H/m
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	min. 200 g (depending on process connection)
Installation position	any ¹¹
Operational life	$> 100 \times 10^6$ cycles

Pin configuration

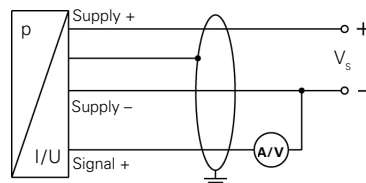
Electrical connection		ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	Cable colours (DIN 47100)
2-wire-system	Supply +	1	3	1	1	white
	Supply -	2	4	2	2	brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply +	1	3	1	1	white
	Supply -	2	4	2	2	brown
	Signal +	3	1	3	3	green
	Ground	ground pin	5	4	4	yellow / green (shield)

Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)



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

¹¹ Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $P_N \leq 1$ bar.

DMK 331P

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1 pressure ranges $P_N < 1.6$ bar not possible with mechanical connection G1/2" flush;
for vacuum and nominal pressure abs. the max. medium temperature is 70 °C
2 different cable types and lengths deliverable
3 standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube
4 for gauge pressure up to 40 bar cable with ventilation tube required
5 Name of oil: Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662
6 cooling element up to 150°C not with pressure range $P_N > 100$ bar