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

Characteristics

- 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

CE Ex

DMK 331 P
Flush Pressure Transmitter

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 ... 36 V_{DC}	Ex-protection: V_S = 14 ... 28 V_{DC}
Optional	3-wire:	0 ... 20 mA / V_S = 14 ... 36 V_{DC} 0 ... 10 V / V_S = 14 ... 36 V_{DC}	

Performance

Accuracy	IEC 60770 [3]: ≤ ± 0.5 % FSO	BFSL: ≤ ± 0.25 % FSO
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S\,min}) / 0.02]$ Ω 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	
Response time	< 10 msec	

Thermal effects (Offset and Span) [4]

Thermal error for offset and span	≤ ± 0.2 % FSO / 10 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 V, I_i = 93 mA, P_i = 660 mW, $C_i \leq$ 1nF, $L_i \leq$ 10 µH

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 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)

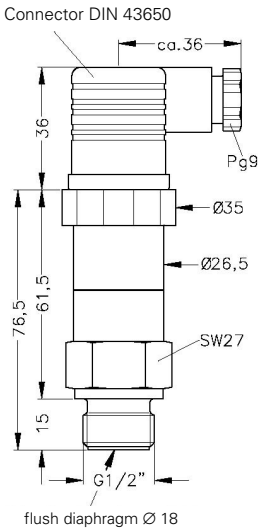
[4] an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

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

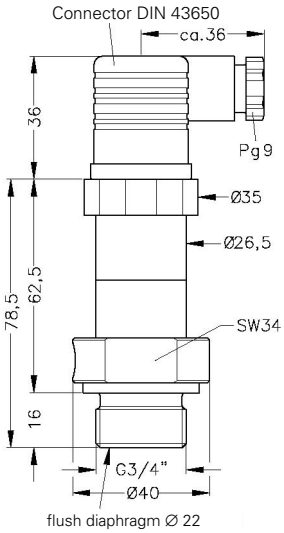
[6] with optional cooling element its maximum permissible temperature is valid

Mechanical connection

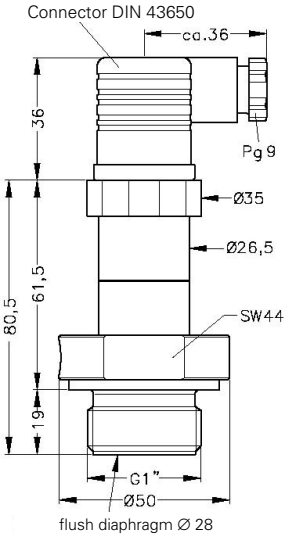
Standard **Optional**



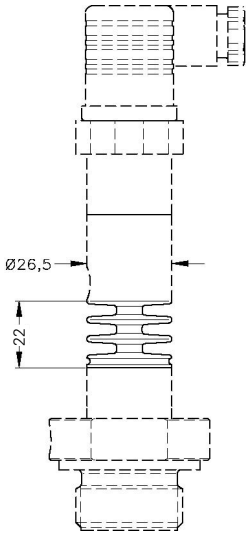
G1/2" flush [1]
(DIN 3852)
M20 x 1.5



G3/4" flush
(DIN 3852)



G1" flush
(DIN 3852)

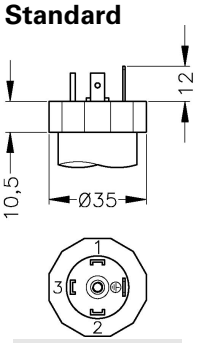


with cooling element
150 °C [7]

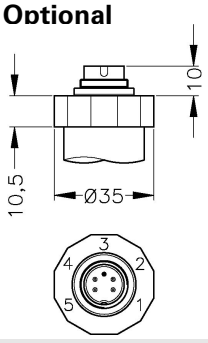
⇨ Ex-protection: total length increases by 26.5mm!

Electrical connection

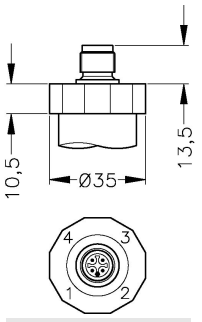
Standard **Optional**



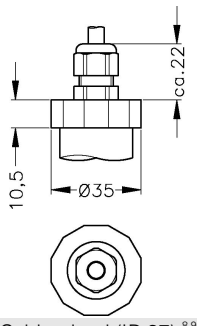
DIN 43650 (IP 65)



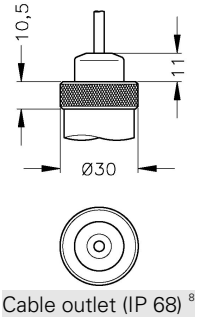
Binder Series 723 (IP 67)



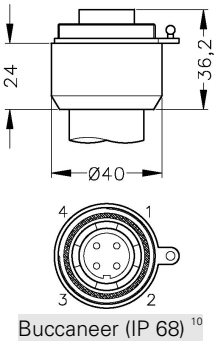
M12x1 4-pin (IP 67)



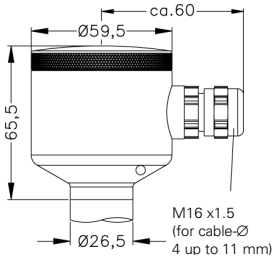
Cable gland (IP 67) [8,9]



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: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube
[10] for gauge pressure up to 40 bar cable with ventilation tube required

DMK 331 P

Flush Pressure Transmitter

Technical Data

Filling Fluids

Standard	Silicon oil
Optional	food compatible oil (with FDA-approval) / Halocarbon / 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 ≥ 100 bar: NBR / others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diagragm

Miscellaneous

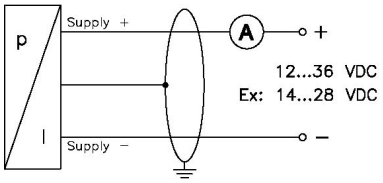
Cable capacitance [11]	cable without air tube: cable with air tube:	signal line/shield: 160 pF/m signal line/shield: 150 pF/m	signal line/signal line: 120 pF/m signal line/signal line: 100 pF/m
Cable inductance [11]	cable without air tube: cable with air tube:	signal line/shield: 0.65 µH/m signal line/shield: 1.0 µH/m	signal line/signal line: 0.65 µH/m signal line/signal line: 1.0 µH/m
Current consumption	signal output current: signal output voltage:	max. 25 mA max. 7 mA	
Weight	min. 200 g (depending on process connection)		
Installation position	any [12]		
Operational life	> 100 x 10^6 cycles		

Pin configuration

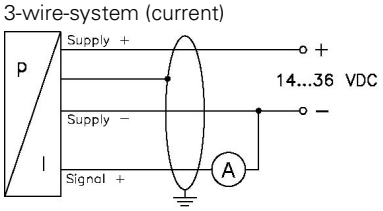
Electrical connection		DIN 43650	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	Cable colours [11] (DIN 47100)
2-wire-system	Supply + Supply –	1 2	3 4	1 2	1 2	white brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply + Supply – Signal +	1 2 3	3 4 1	1 2 3	1 2 3	white brown green
	Ground	ground pin	5	4	4	yellow / green (shield)

Wiring diagrams

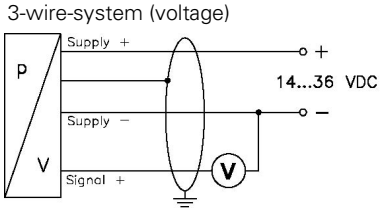
2-wire-system (current)



3-wire-system (current)



3-wire-system (voltage)



[11] if the electrical connection is a mounted cable by factory

[12] 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 ≤ 1 bar.

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