DMP 331 P

Pressure Transmitter with Flush Pressure Port

- foodstuff industry, pharmaceutical and chemical industries, etc.
- medium temperature up to 300 °C
- accuracy:
  0.175% / 0.125% FSO BFSL
  (0.35 % / 0.25% FSO IEC 60770)
- nominal pressure ranges from
  0 ... 100 mbar up to 0 ... 40 bar

The DMP 331 P is a pressure transmitter for process measurement. Usage is possible with all media that are compatible with stainless steel 1.4435 (316L) and sealing material.

A piezoresistive stainless steel sensor, which features small thermal effect and excellent linearity, generate the base of the DMP 331 P. So it is possible to meet accuracy demands up to 0.25 % FSO (IEC 60770). Besides silicon oil and food compatible oil also Halocarbon or other filling oils can be delivered on request.

For usage with higher media temperature a cooling element can be added optionally. Thus media temperatures up to 300 °C can be achieved. The flush pressure ports are made with inch, clamp, or dairy pipe connection. Further pressure ports or chemical seals are available on request. Additional the DMP 331 P is suited for explosive area (zone 0).

Preferred areas of use are:

- process engineering
- chemical industry
- foodstuff industry
- paper industry

Characteristics

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

CE Ex

DMP 331 P
Process Pressure Transmitter

DMP 331 P

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Technical Data

Input pressure range

Nominal pressure gauge	[bar]	-1...0 [1]	0.10	0.16	0.25	0.4	0.6	1.0	1.6	2.5	4.0	6.0	10	16	25	40
Nominal pressure abs. [1]	[bar]	-	-	-	-	-	0.6	1.0	1.6	2.5	4.0	6.0	10	16	25	40
Permissible overpressure	[bar]	3	1	1	1	1	3	3	6	6	20	20	60	60	60	100

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 [2]	BFSL
	standard:	nominal pressure > 0.4 bar:	≤ ± 0.35 % FSO	≤ ± 0.175 % FSO
		nominal pressure ≤ 0.4 bar:	≤ ± 0.50 % FSO	≤ ± 0.250 % FSO
	option:	nominal pressure > 0.4 bar:	≤ ± 0.25 % FSO	≤ ± 0.125 % FSO
Permissible load	current 2-wire:	$R_{max} = [(V_S - V_{S\,min}) / 0.02]\ \Omega$		
	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		
Response time	< 10 msec			

Thermal effects (Offset and Span) [3]

Nominal pressure P_N	[bar]	-1 ... 0	≤ 0.1	≤ 0.25	≤ 0.4	≤ 1.0	> 1.0
Tolerance band	[% FSO]	≤ ± 0.75	≤ ± 2.0	≤ ± 1.5	≤ ± 1.0	≤ ± 1.0	≤ ± 0.75
TC, average	[% FSO / 10 K]	± 0.12	± 0.4	± 0.3	± 0.2	± 0.15	± 0.12
in compensated range	[°C]	0 ... 70	0 ... 50			0 ... 70	

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-DMP 331 P	zone 0 [4]: 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 ... 125 °C [1, 5, 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] for vacuum and nominal pressure abs. the max. medium temperature is 70 °C

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

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

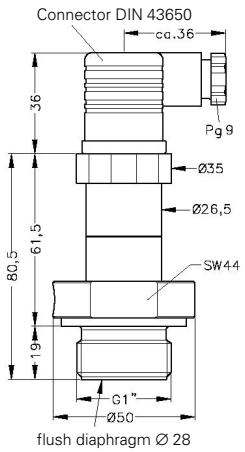
[4] approved for atmospheric pressure from 0.8 bar up to 1.1 bar

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

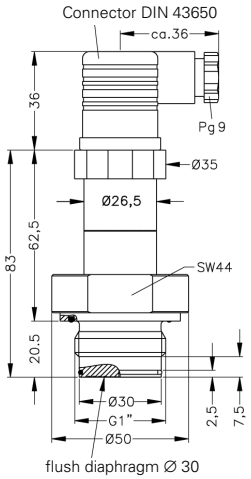
[6] max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 30 minutes with a max. environmental temperature of 50 °C

Mechanical connection

Inch Thread (DIN 3852)

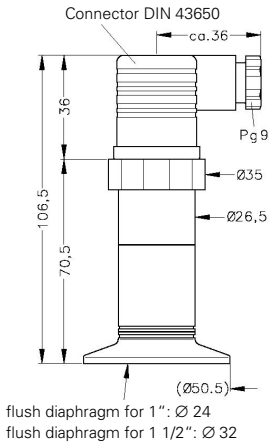


G1" flush

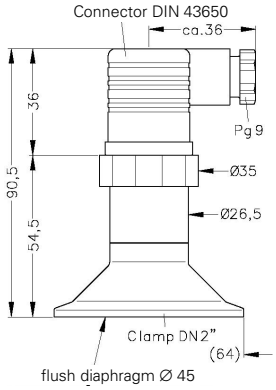


G1" flush
with radial O-ring

Clamp (ISO 2852)

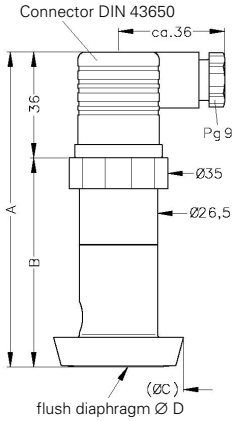


DN1" or DN 1 1/2"



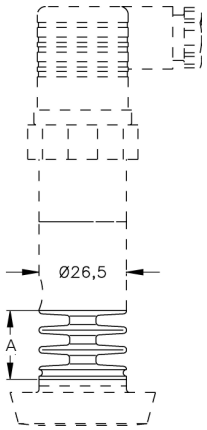
DN2"

Dairy pipe (DIN 11851)



Dimensions in mm			
size	DN 25	DN 40	DN 50
A	107	89	89
B	71	53	53
C	44	56	68.5
D	24	32	45

Cooling element

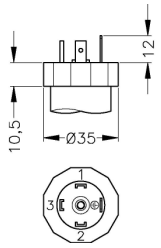


Dimensions in mm		
size	150° C	300° C
A	22	34

⇨ Ex-protection: total length increases by 20 mm!

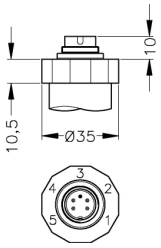
Electrical connection

Standard

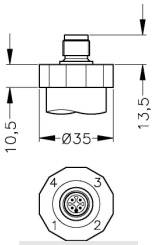


DIN 43650
(IP 65)

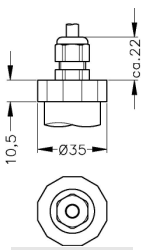
Optional



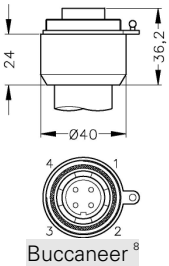
Binder Series 723
(IP 67)



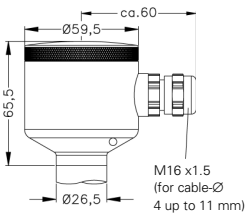
M12x1 4-pin
(IP 67)



Cable gland [7]
(IP 67)



Buccaneer [8]
(IP 68)



Field housing
(IP 67)

[7] different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube), optionally cable with ventilation tube

[8] for gauge pressure cable with ventilation tube required

DMP 331 P

Process 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 1.4435 (316L) / Monel on request
Housing	stainless steel 1.4301 (304) / field housing 1.4305 (303) with cable gland of brass, nickel plated
Seals (media wetted)	inch thread: FKM / clamp und dairy pipe: without / others on request
Diaphragm	stainless steel 1.4435 (316L) / Tantalum and Hastelloy on request
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

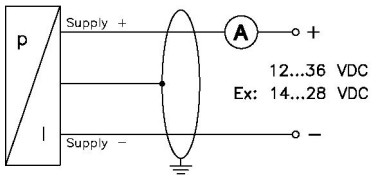
Cable capacitance [9]	cable without air tube: cable with air tube:	signal line/shield: 160 pF/m signal line/shield: 150 pF/m	signal line/signal line: 120 pF/m signal line/signal line: 100 pF/m
Cable inductance [9]	cable without air tube: cable with air tube:	signal line/shield: 0.65 µH/m signal line/shield: 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 [10]		
Operational life	> 100 x 10^6 cycles		

Pin configuration

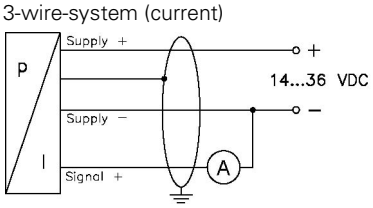
Electrical connection		DIN 43650	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	cable colours [9] (DIN 47100)
2-wire-system	Supply +	1	3	1	1	white
	Supply –	2	4	2	2	brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply +	1	3	1	1	white
	Supply –	2	4	2	2	brown
	Signal +	3	1	3	3	green
	Ground	ground pin	5	4	4	yellow / green (shield)

Wiring diagrams

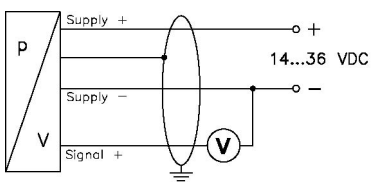
2-wire-system (current)



3-wire-system (current)



3-wire-system (voltage)



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

[10] 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.