

DMP 331

Industrial Pressure Transmitter for Low Pressure

- ▶ piezoresistive stainless steel sensor
- ▶ accuracy:
0.175 %, 0.125 %,
0.10 %, 0.05 % FSO BFSL
(0.35 %, 0.25 %, 0.2 %, 0.1 %
FSO IEC 60770)
- ▶ nominal pressure ranges
from 0 ... 40 mbar
up to 0 ... 40 bar

The DMP 331 is a pressure transmitter for universal use in all branches of industry. Permissible media are compressed air, non-aggressive gases, steam, water, heating and diesel oil as well as all with stainless steel 1.4571 resp. 1.4435 compatible media.

A piezoresistive stainless steel sensor, which features small thermal effect and excellent linearity generate the basis of the DMP 331. So it is possible to meet accuracy demands up to 0,1 % FSO (IEC 60770).

A variety of standard output signals as well as mechanical and electrical connections make the DMP 331 covering a wide field of applications. Additional it is possible to use the DMP 331 in explosive area (zone 0 / 20).

Typical areas of use are:

- ▶ pneumatics / hydraulics
- ▶ process control and chemical industry
- ▶ environmental engineering
- ▶ measurement technology

Characteristics

- ▶ small thermal effect
- ▶ excellent linearity
- ▶ option Ex-version
(only for 4 ... 20 mA / 2-wire)
TÜV 03 ATEX 2006 X
- ▶ option: flush pressure port
- ▶ customer specific versions:
 - special pressure ranges
 - variety of electrical and mechanical connections
 - other versions on request

CE **Ex**

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Technical Data

Input pressure range

Nominal pressure gauge [bar]	-1...0	0.04	0.06	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. [bar]	-	-	-	0.10	0.16	0.25	0.4	0.6	1.0	1.6	2.5	4.0	6.0	10	16	25	40
Permissible overpressure [bar]	3	0.2	0.2	0.5	0.5	1	1	3	3	6	6	20	20	20	60	100	100

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 ¹	BFSL
	standard: nominal pressure > 0.4 bar nominal pressure ≤ 0.4 bar	≤ ± 0.35 % FSO	≤ ± 0.175 % FSO
	option 1: nominal pressure > 0.4 bar	≤ ± 0.50 % FSO	≤ ± 0.250 % FSO
	option 2: nominal pressure ≥ 1 bar	≤ ± 0.25 % FSO	≤ ± 0.125 % FSO
	option 3: nominal pressure ≥ 0.16 bar	≤ ± 0.20 % FSO	≤ ± 0.100 % FSO
		≤ ± 0.10 % FSO	≤ ± 0.050 % 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 / kΩ	
Long term stability	≤ ± 0.1 % FSO / year		
Response time ²	< 5 msec		

Thermal errors (Offset and Span - standard)

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]	± 0.07	± 0.3	± 0.2	± 0.14	± 0.1	± 0.07
in compensated range [°C]	0 ... 70		0 ... 50		0 ... 70	

Thermal errors (Offset and Span - optional for -20 ... 50 °C)

Nominal pressure P_N [bar]	-1 ... 0	≤ 0.25	≤ 0.4	≤ 1.0	> 1.0
Tolerance band [% FSO]	≤ ± 1.5	≤ ± 2.0	≤ ± 1.5	≤ ± 1.0	≤ ± 0.75
TC, average [% FSO / 10 K]	± 0.2	± 0.3	± 0.2	± 0.1	± 0.07
in compensated range [°C]			-20 ... 50		

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	zone 0 ³ : II 1 G EEx ia IIC T4 zone 20: II 1 D T 85°C safety technical maximum values: $V_i = 28 V$, $I_i = 93 mA$, $P_i = 660 mW$, $C_i \leq 1 nF$, $L_i \leq 10 \mu H$

Permissible temperatures

Medium	-25 ... 125 °C		
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 accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

² with optional accuracy 0.1 % FSO the response time is 200 msec

³ approved for atmospheric pressure from 0.8 bar up to 1.1 bar

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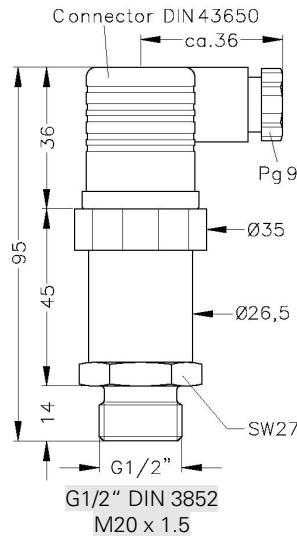
Technical Data

Mechanical stability

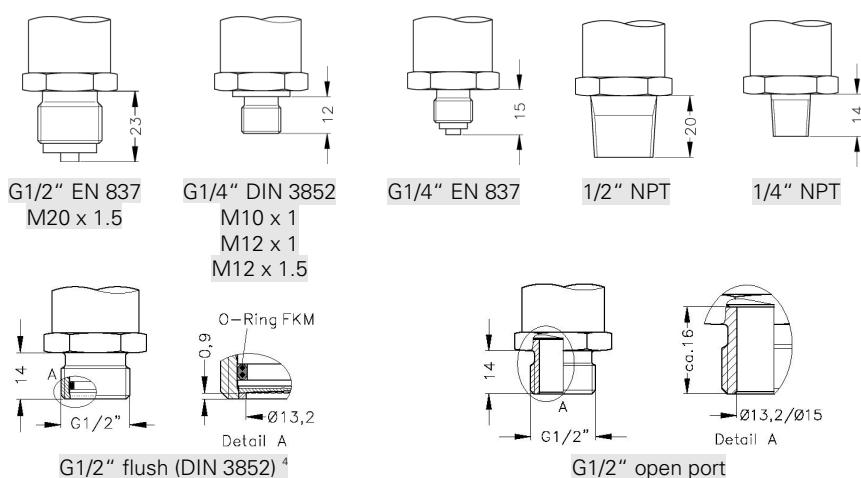
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec

Mechanical connection

Standard



Optional

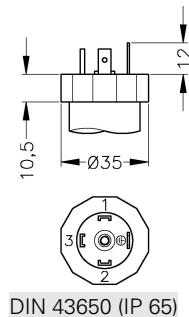


⇒ Total length of devices with Ex-protection increases by 20 mm!

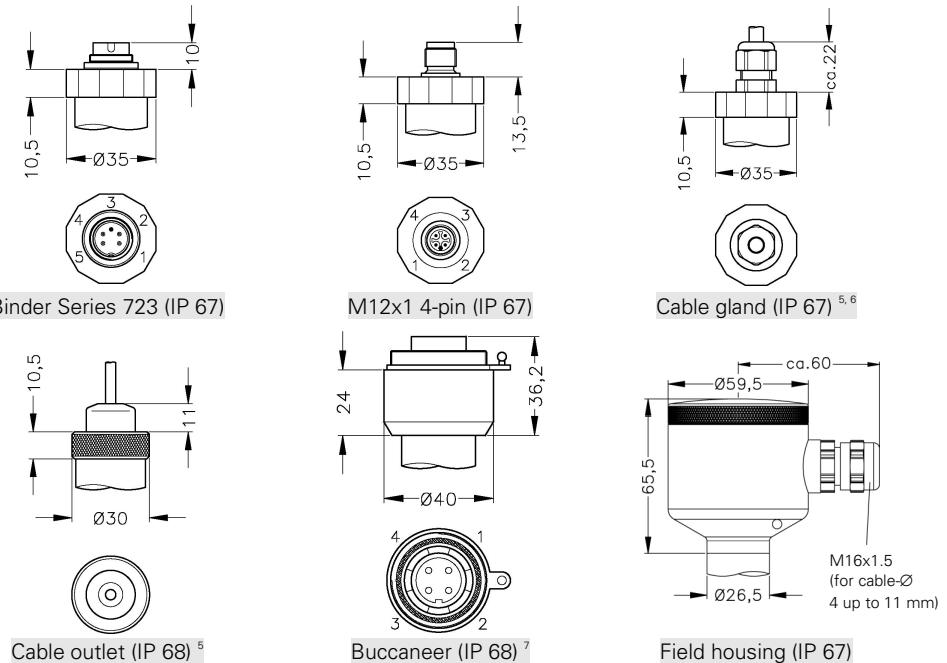
⇒ Total length of devices with accuracy 0.1 % FSO IEC 60770 increases by 37 mm! (standard and Ex-protection)

Electrical connection

Standard



Optional



⁴ impossible for nominal pressure $P_n < 0.1$ bar and for vacuum ranges

⁵ different cable types and lengths available

⁶ standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube

⁷ for gauge pressure cable with ventilation tube required

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Technical Data

Materials

Pressure port	stainless steel 1.4571 (316Ti)
Housing	standard: stainless steel 1.4301 (304) field housing: stainless steel 1.4305 (303), cable gland: brass, nickel plated
Seals (media wetted)	standard: FKM optional: EPDM; welded version ⁸ ; others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

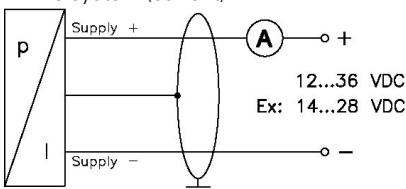
Cable capacitance ⁹	cable without air tube: cable with air tube:	signal line/shield: 160 pF/m signal line/shield: 150 pF/m	signal line/signal line: 120 pF/m signal line/signal line: 100 pF/m
Cable inductance ⁹	cable without air tube: cable with air tube:	signal line/shield: 0.65 µH/m signal line/shield: 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	approx. 140 g		
Installation position	any ¹⁰		
Operational life	> 100 x 10 ⁶ cycles		

Pin configuration

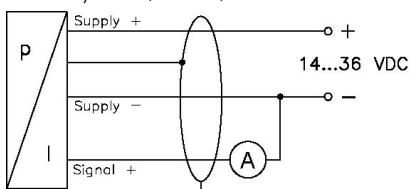
Electrical connection		DIN 43650	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	cable colours ⁹ (DIN 47100)
2-wire-system	Supply + Supply -	1 2	3 4	1 2	1 2	white brown
	Ground	ground pin	5	4	4	yellow / green (shield)
3-wire-system	Supply + Supply - Signal +	1 2 3	3 4 1	1 2 3	1 2 3	white brown green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

Wiring diagrams

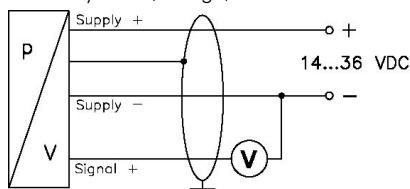
2-wire-system (current)



3-wire-system (current)



3-wire-system (voltage)



⁸ welded version only with pressure ports according to EN 837; welded version not available with pressure ranges ≤ 0.16 bar

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.

Ordering code DMP 331

DMP 331

¹ absolute pressure possible from 0.1 bar

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 cable with ventilation tube required

⁵ Mechanical connection G1/2" DIN 3852 flush impossible for nominal pressure PN < 0.1 bar and for vacuum ranges

6 welded version only with pressure ports according to EN 837; not possible with pressure ranges ≤ 0.16 bar