

# 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 ... 100 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
- ▶ mechanical engineering
- ▶ process control and chemical industry
- ▶ environmental engineering
- ▶ measurement technology

- ▶ 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

Characteristics

DMP 331  
Industrial Pressure Transmitter



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Technical Data

Input pressure range																
Nominal pressure gauge [bar]	-1...0	0.10	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	
Nominal pressure abs. [bar]	-	0.10	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	
Permissible overpressure [bar]	3	1	1	1	1	3	3	6	6	20	20	60	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	standard:	nominal pressure > 0.4 bar	IEC 60770 <sup>1</sup>	BFSL
		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 <sup>2</sup>	< 5 msec			

Thermal errors (Offset and Span - standard)						
Nominal pressure $P_N$ [bar]	-1 ... 0	≤ 0.1	≤ 0.25	≤ 0.4	≤ 1	> 1
Tolerance band [% FSO]	≤ ± 0.75	≤ ± 2	≤ ± 1.5	≤ ± 1	≤ ± 1	≤ ± 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		> 1
Tolerance band [% FSO]	≤ ± 1.5	≤ ± 2	≤ ± 1.5	≤ ± 1		≤ ± 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 <sup>3</sup> : II 1 G Ex ia IIC T4 zone 20: II 1 D Ex tD A20 IP65 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	

<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>2</sup> with optional accuracy 0.1 % FSO the response time is 200 msec

<sup>3</sup> approved for atmospheric pressure from 0.8 bar up to 1.1 bar

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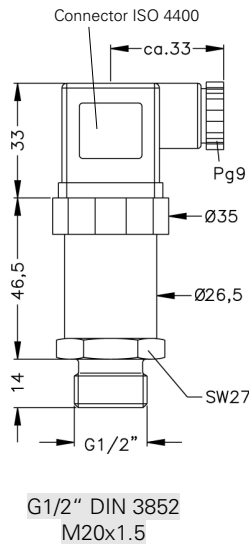
Technical Data

## Mechanical stability

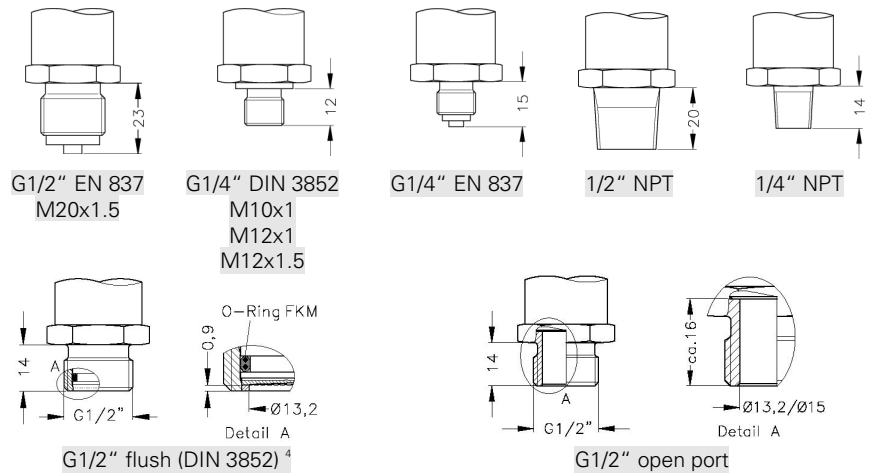
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec

## Mechanical connection (dimensions in mm)

### Standard



### Optional

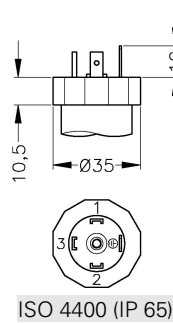


⇒ Total length of devices with Ex-protection increases by 20 mm!

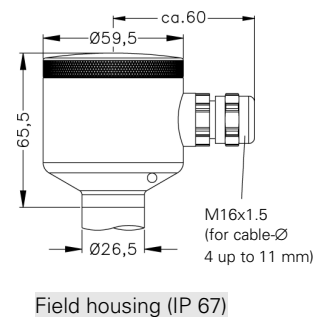
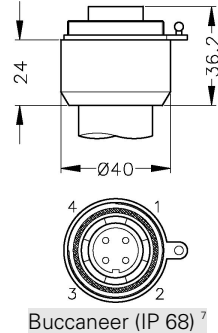
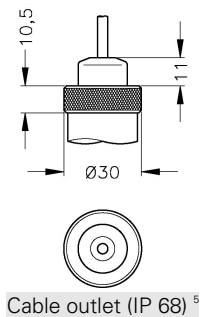
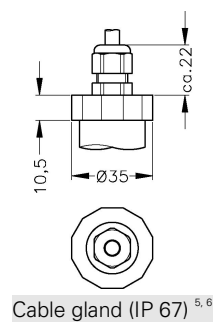
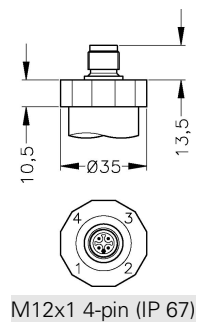
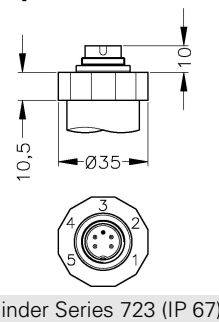
⇒ Total length of devices with accuracy 0.1 % FSO IEC 60770 increases by 37 mm! (standard and Ex-protection)

## Electrical connection (dimensions in mm)

### Standard



### Optional



<sup>4</sup> impossible for vacuum ranges

<sup>5</sup> different cable types and lengths available

<sup>6</sup> standard: 2m PVC cable without ventilation tube, optionally cable with ventilation tube

<sup>7</sup> for gauge pressure cable with ventilation tube required

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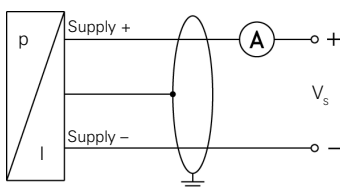
Materials	
Pressure port	stainless steel 1.4571 (316Ti)
Housing	standard: stainless steel 1.4301 (304) field housing: stainless steel 1.4305 (303), cable gland: brass, nickel plated
Seals (media wetted)	standard: FKM optional: EPDM; welded version <sup>8</sup> ; others on request
Diaphragm	stainless 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 µH/m
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 140 g
Installation position	any <sup>9</sup>
Operational life	> 100 x 10 <sup>6</sup> cycles

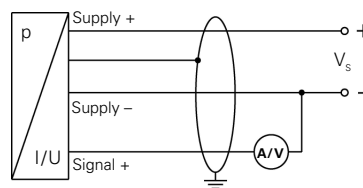
Pin configuration							
Electrical connection		ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	Field housing	cable colours (DIN 47100)
2-wire-system	Supply +	1	3	1	1	IN +	white
	Supply -	2	4	2	2	IN -	brown
	Ground	ground pin	5	4	4	≡	yellow / green (shield)
3-wire-system	Supply +	1	3	1	1	IN +	white
	Supply -	2	4	2	2	IN -	brown
	Signal +	3	1	3	3	OUT +	green
	Ground	ground pin	5	4	4	≡	yellow / green (shield)

## Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)



<sup>8</sup> welded version only with pressure ports according to EN 837; welded version not available with pressure ranges  $\leq 0.16$  bar

<sup>9</sup> 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.

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

