

# DMP 331i DMP 333i LMP 331i

### Precision-

- Pressure Transmitter
- Screw-in Transmitter
- ▶ nominal pressure ranges from 0 ... 170 mbar up to 0 ... 600 bar

The precision pressure transmitters DMP 331i and DMP 333i as well as the precision screw-in transmitter LMP 331i represent the further development of our approved standard transmitters for industrial use.

The signal processing of the sensor signal occurs about a digital amplifier with 16-bit A/D and D/A conversion. Now it's possible to compensate actively the sensor specific deviations like nonlinearity and thermal effects. You will get pressure transmitters with excellent technical features at an extraordinary price.

The precision transmitter can be delivered with communication interface and Ex-version.

Typical areas of use are:

DMP 331i / DMP 333i:

- ▶ process control
- ▶ laboratory applications
- ▶ gas consumption and calorimetric measurements

LMP 331i:

- ▶ tank level measurement of neutral and aggressive fluids
- ▶ chemical, pharmaceutical and foodstuff industry
- ▶ water and sewage treatment

- ▶ **accuracy**  
0.05 % FSO BFSL  
(0.1 % FSO IEC 60770)
- ▶ **thermal error for offset and span in compensated range**  
-20 ... 80 °C: 0.2 % FSO,  
average TC 0.02 % FSO / 10 K
- ▶ output signal  
4 ... 20 mA / 2-wire or  
0 ... 10 V / 3-wire
- ▶ option: communication interface for adjusting of offset, span, and damping
- ▶ good long term stability
- ▶ option Ex version  
(only for 4 ... 20 mA / 2-wire)  
TÜV 03 ATEX 2006 X
- ▶ customer specific versions:
  - special pressure ranges
  - other versions on request

Characteristics



**DMP 331i / DMP 333i / LMP 331i**  
Precision Pressure Transmitter

Input pressure range								
<b>DMP 331i</b> <sup>1</sup>								
<b>Pressure ranges</b>								
Nominal pressure gauge [bar]	0 ... 0.17	0 ... 0.35	0 ... 1	0 ... 2	0 ... 7	0 ... 17	0 ... 35	
Nominal pressure abs. [bar]	-	0 ... 0.35	0 ... 1	0 ... 2	0 ... 7	0 ... 17	0 ... 35	
Permissible overpressure [bar]	0.5	1	3	6	20	60	100	
<b>Vacuum ranges</b>								
Nominal pressure gauge [bar]	-0.17 ... 0.17	-0.35 ... 0.35	-1 ... 1		-1 ... 2		-1 ... 7	
Permissible overpressure [bar]	0.5	1	3		6		20	
<b>DMP 333i</b> <sup>1</sup>								
Nominal pressure gauge <sup>2</sup> [bar]	0 ... 70	0 ... 170	0 ... 350	0 ... 600				
Nominal pressure abs. [bar]	0 ... 70	0 ... 170	0 ... 350	0 ... 600				
Permissible overpressure [bar]	140	340	600	1000				
<b>LMP 331i</b>								
Nominal pressure gauge [bar]	0 ... 0.17	0 ... 0.35	0 ... 1	0 ... 2	0 ... 7	0 ... 17	0 ... 35	
Level [mWC]	0 ... 1.7	0 ... 3.5	0 ... 10	0 ... 20	0 ... 70	0 ... 170	0 ... 350	
Permissible overpressure [bar]	0.5	1	3	6	20	60	100	

Output signal / Supply			
Standard	2-wire:	4 ... 20 mA / V <sub>s</sub> = 12 ... 36 V <sub>DC</sub>	Ex-protection: V <sub>s</sub> = 14 ... 28 V <sub>DC</sub>
Optional	2-wire:	4 ... 20 mA with communication interface <sup>3</sup>	
	3-wire:	0 ... 10 V / V <sub>s</sub> = 14 ... 36 V <sub>DC</sub>	
	3-wire:	0 ... 10 V with communication interface <sup>3</sup>	

Performance	
Accuracy	IEC 60770 <sup>4</sup> : ≤ ± 0.1 % FSO      BFS: ≤ ± 0.05 % FSO
performance after turn-down (TD)	no change of accuracy <sup>5</sup>
- TD ≤ 1:5	for calculation use the following formula (for nominal pressure ranges ≤ 0.35 bar see note <sup>5</sup> ):
- TD > 1:5	≤ ± [0.1 + 0.015 x (nominal range / adjusted range)] % FSO
	e.g. with a turn-down of 1:10 following accuracy is calculated:
	≤ ± (0.1 + 0.015 x 10) % FSO i.e. accuracy is ≤ ± 0.25 % FSO
Permissible load	current 2-wire: R <sub>max</sub> = [(V <sub>s</sub> - V <sub>smin</sub> ) / 0.02] Ω voltage 3-wire: R <sub>min</sub> = 10 kΩ
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± (0.1 x nominal range / adjusted range) % FSO / year
Response time	approx. 40 ms
Adjustability	configuration of following parameters possible (interface / software necessary <sup>6</sup> ): - electronic damping: 0 ... 100 s - offset: 0 ... 90 % FSO - turn down of span: max. 1:10

Thermal errors (Offset and Span)	
Tolerance band	≤ ± (0.2 x nominal range / adjusted range) % FSO
TC, average	± (0.02 x nominal range / adjusted range) % FSO / 10 K
in compensated range	- 20 ... 80 °C

<sup>1</sup> pressure ranges ≤ 40 bar as DMP 331i; pressure ranges > 40 bar as DMP 333i

<sup>2</sup> measurement starts with ambient pressure

<sup>3</sup> only possible with el. connection Binder serie 723 (7pin)

<sup>4</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>5</sup> except nominal pressure ranges ≤ 0.35 bar; for these calculation of accuracy is as follows: ≤ ± (0.1 + 0.02 x nominal range / adjusted range) % FSO  
e.g. turn-down of 1:3: ≤ ± (0.1 + 0.02 x 3) % FSO i.e. accuracy is ≤ ± 0.16 % FSO

<sup>6</sup> software, interface, and cable have to be ordered separately (software appropriate for Windows<sup>®</sup> 95, 98, 2000, NT Version 4.0 or higher, and XP)

# DMP331i / DMP333i / LMP331i

Precision Pressure Transmitter

Technical Data

## 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 331i / DX13-DMP 333i / DX13-LMP 331i	zone 0 <sup>7</sup> : II 1 G EEx ia IIC T4 zone 20: II 1 D T 85°C safety technical maximum values: $U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C_i \leq 1 \text{ nF}$ , $L_i \leq 10 \text{ } \mu\text{H}$

## Mechanical stability

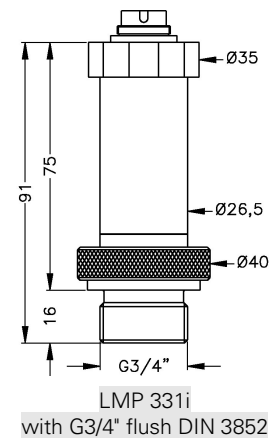
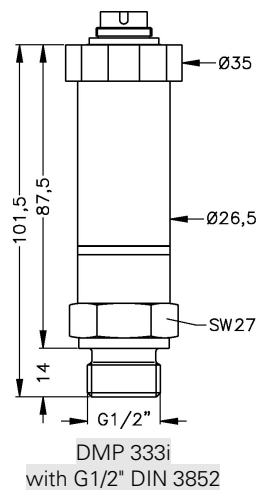
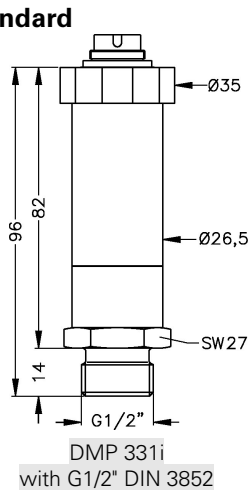
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

## Permissible temperatures

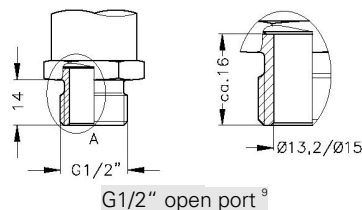
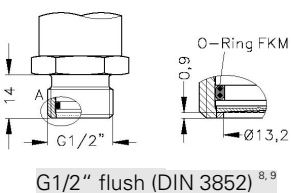
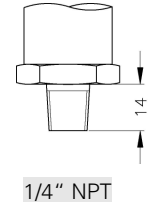
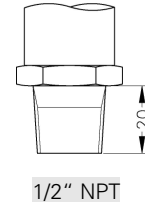
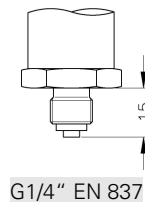
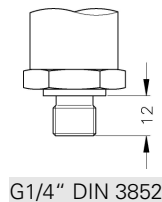
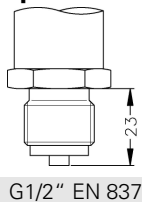
Medium	-25 ... 125 °C	
Electronics / environment	-25 ... 85 °C	Ex-protection: application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C
Storage	-40 ... 100 °C	

## Mechanical connection

### Standard



### Optional for DMP 331i and DMP 333i



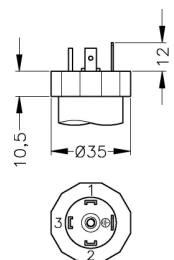
<sup>7</sup> approved for atmospheric pressure from 0.8 bar up to 1.1 bar

<sup>8</sup> not possible for nominal pressure  $P_n < 0.1 \text{ bar}$  and for vacuum ranges

<sup>9</sup> only possible for DMP 331i

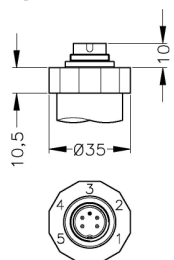
### Electrical connection

#### Standard

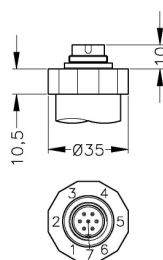


DIN 43650 (IP 65)

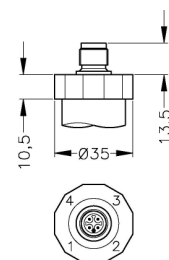
#### Optional



Binder Series 723 5-pin (IP 67)



Binder Series 723 7-pin (IP 67)



M12x1 4-pin (IP 67)

### Materials

Pressure port	stainless steel 1.4571 (316Ti)	
Housing	stainless steel 1.4301 (304)	
Seals (media wetted)	DMP 331i / LMP 331i: FKM optional: welded version <sup>10</sup> ; others on request	DMP 333i: NBR
Diaphragm	stainless steel 1.4435 (316L)	
Media wetted parts	pressure part, seals, diaphragm	

### Miscellaneous

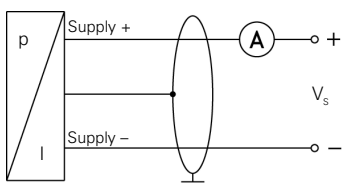
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 180 ... 200 g
Installation position	any <sup>11</sup>
Operation life	> 100 x 10 <sup>6</sup> cycles

### Pin configuration

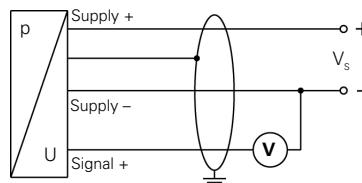
Electrical connection		DIN 43650	Binder 723 (5-pin)	Binder 723 (7-pin)	M12x1 (4-pin)
2-wire-system	Supply +	1	3	3	1
	Supply -	2	4	1	2
	Ground	ground pin	5	2	4
3-wire-system	Supply +	1	3	3	1
	Supply -	2	4	1	2
	Signal +	3	1	6	3
	Ground	ground pin	5	2	4
Communication interface <sup>12</sup>	RxD	-	-	4	-
	TxD	-	-	5	-
	GND	-	-	7	-

### Wiring diagram

#### 2-wire-system (current)



#### 3-wire-system (voltage)



<sup>10</sup> welded version only with pressure ports according to EN 837; welded version not available with pressure ranges  $\leq 0.16$  bar and  $> 40$  bar

<sup>11</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.

<sup>12</sup> may not be transmitted directly with the PC (the suitable adapter "Adapt 1" is available as accessory)

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