



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								
DMP 331i ¹								
Pressure ranges								
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	
Vacuum ranges								
Nominal pressure gauge [bar]	-0.17 ... 0.17	-0.35 ... 0.35	-1 ... 1	-1 ... 2	-1 ... 7	-1 ... 17	-1 ... 35	
Permissible overpressure [bar]	0.5	1	3	6	20	60	100	
DMP 333i ¹								
Nominal pressure gauge ² [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				
LMP 331i								
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 / $V_s = 12 \dots 36 V_{DC}$	Ex-protection: $V_s = 14 \dots 28 V_{DC}$
Optional	2-wire:	4 ... 20 mA with communication interface ³	
	3-wire:	0 ... 10 V / $V_s = 14 \dots 36 V_{DC}$	
	3-wire:	0 ... 10 V with communication interface ³	

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

Thermal errors (Offset and Span)	
Tolerance band	$\leq \pm (0.2 \times \text{nominal range} / \text{adjusted range}) \% \text{ FSO}$
TC, average	$\pm (0.02 \times \text{nominal range} / \text{adjusted range}) \% \text{ FSO} / 10 \text{ K}$
in compensated range	- 20 ... 80 °C

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

² measurement starts with ambient pressure

³ only possible with el. connection Binder serie 723 (7pin)

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

⁵ except nominal pressure ranges ≤ 0.35 bar; for these calculation of accuracy is as follows: $\leq \pm (0.1 + 0.02 \times \text{nominal range} / \text{adjusted range}) \% \text{ FSO}$
e.g. turn-down of 1:3: $\leq \pm (0.1 + 0.02 \times 3) \% \text{ FSO}$ i.e. accuracy is $\leq \pm 0.16 \% \text{ FSO}$

⁶ software, interface, and cable have to be ordered separately (software appropriate for Windows[®] 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 ⁷ : 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

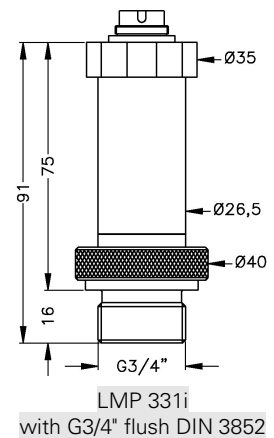
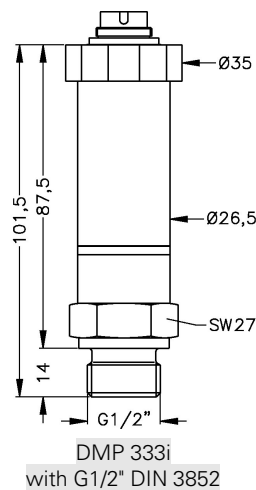
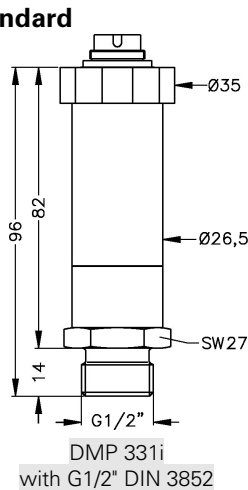
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

Permissible temperatures

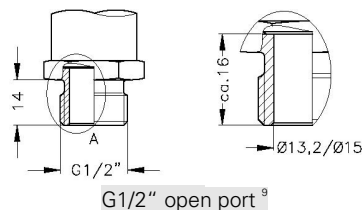
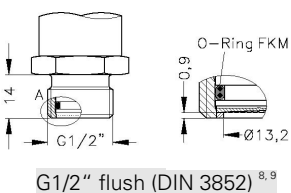
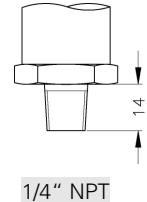
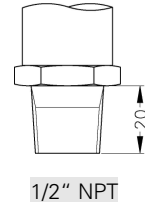
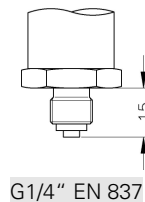
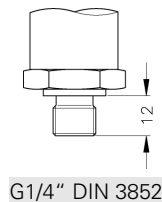
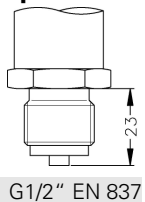
Medium	-25 ... 125 °C	
Electronics / environment	-25 ... 85 °C	Ex-protection: application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C
Storage	-40 ... 100 °C	

Mechanical connection

Standard



Optional for DMP 331i and DMP 333i



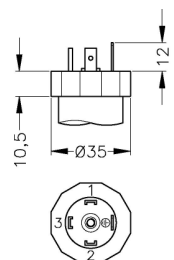
⁷ approved for atmospheric pressure from 0.8 bar up to 1.1 bar

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

⁹ only possible for DMP 331i

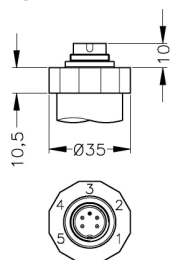
Electrical connection

Standard

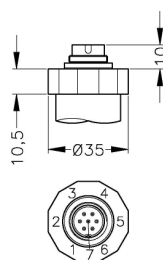


DIN 43650 (IP 65)

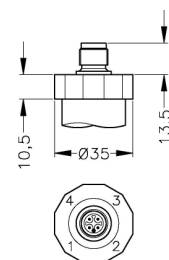
Optional



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 ¹⁰ ; others on request	DMP 333i: NBR
Diaphragm	stainless steel 1.4435 (316L)	
Media wetted parts	pressure part, seals, diaphragm	

Miscellaneous

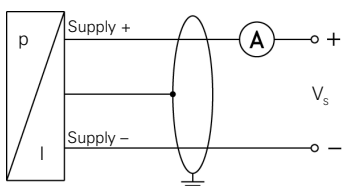
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 180 ... 200 g
Installation position	any ¹¹
Operation life	> 100 x 10 ⁶ cycles

Pin configuration

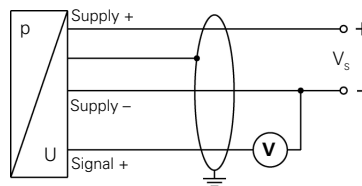
Electrical connection		DIN 43650	Binder 723 (5-pin)	Binder 723 (7-pin)	M12x1 (4-pin)
2-wire-system	Supply +	1	3	3	1
	Supply -	2	4	1	2
	Ground	ground pin	5	2	4
3-wire-system	Supply +	1	3	3	1
	Supply -	2	4	1	2
	Signal +	3	1	6	3
	Ground	ground pin	5	2	4
Communication interface ¹²	RxD	-	-	4	-
	TxD	-	-	5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

Wiring diagram

2-wire-system (current)



3-wire-system (voltage)



¹⁰ welded version only with pressure ports according to EN 837; welded version not available with pressure ranges ≤ 0.16 bar and > 40 bar

¹¹ 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.

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

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

Ordering Code DMP 331i/ DMP 333i/ LMP 331i

**DMP 331i/ DMP 333i/
LMP 331i**

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Pressure										
For DMP 331i										
	gauge	1	1	0						
	absolute	1	1	1						
For DMP 333i										
	gauge ¹	1	3	0						
	absolute	1	3	1						
For LMP 331i										
	in bar	4	3	0						
	in mWC	4	3	1						
Input [mWC] [bar]										
For DMP 331i² or LMP 331i										
	1,7	0,17	1	7	0	0				
	3,5	0,35	3	5	0	0				
	10	1,0	1	0	0	1				
	20	2,0	2	0	0	1				
	70	7,0	7	0	0	1				
	170	17,0	1	7	0	2				
	350	35	3	5	0	2				
For DMP 333i²										
	70		7	0	0	2				
	170		1	7	0	3				
	350		3	5	0	3				
	600		6	0	0	3				
For DMP 331i										
	-0,17 ... 0,17		S	1	7	0				
	-0,35 ... 0,35		S	3	5	0				
	-1 ... 1		S	1	0	2				
	-1 ... 2		V	2	0	2				
	-1 ... 7		V	7	0	2				
	customer		9	9	9	9				
Output										
	4 ... 20 mA / 2-wire						1			
	Intrinsic safety 4 ... 20 mA / 2-wire						E			
	0 ... 10 V / 3-wire						3			
	customer						9			
Accuracy (at nominal pressure)										
	0,1 %						1			
	customer						9			
Electrical connection										
	Male and female plug DIN 43650						1	0	0	
	Binder series 723 (5-pin)						2	0	0	
	Male and female plug						A	0	0	
	Binder series 723 (7-pin)						M	0	0	
	M12x1 (4-pin)						9	9	9	
	customer						9	9	9	
Mechanical connection										
For DMP 331i or DMP 333i										
	G1/2" DIN 3852						1	0	0	
	G1/2" EN 837						2	0	0	
	G1/4" DIN 3852						3	0	0	
	G1/4" EN 837						4	0	0	
	G1/2" DIN 3852 with ^{3,4}						F	0	0	
	flush sensor						H	0	0	
	G1/2" DIN 3852 open pressure port ⁴						N	0	0	
	1/2" NPT						N	4	0	
	1/4" NPT						K	0	0	
For LMP 331i										
	G3/4" DIN 3852 with flush sensor						9	9	9	
	customer						9	9	9	
Seals										
For DMP 331i or LMP 331i										
	FKM								1	
	without (welded version) ⁵								2	
For DMP 333i										
	NBR								5	
	customer								9	
Special version										
	standard								1	1
	RS-232 interface ⁶								1	2
	customer								9	9

¹ measurement starts with ambient pressure
² pressure ranges ≤ 40 bar as DMP 331i; pressure ranges > 40 bar as DMP 333i
³ Mechanical connection G1/2" DIN 3852 flush impossible for nominal pressure PN < 0.1 bar and for vacuum ranges
⁴ only possible for DMP 331i
⁵ welded version only with pressure ports according to EN 837; not possible with pressure ranges ≤ 0.16 bar and > 40 bar
⁶ RS-232 interface only possible with el. connection Binder serie 723 (7pin)
 Software, Interface and cable for DMP 331i, DMP 333i and LMP 331i with option RS-232 have to be order separately
 (Order-Nr.: I-232; Software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or newer and XP)
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