DMP 331 i
DMP 333 i
LMP 331 i

Precision Pressure Transmitter / Screw-in transmitter

Stainless Steel Sensor

accuracy according to IEC 60770: 0.1 % FSO

DMP 331i DMP 333i LMP 331i

Nominal pressure

from 0 ... 400 mbar
up to 0 ... 600 bar

Output signal

2-wire: 4 ... 20 mA
3-wire: 0 ... 10 V
others on request

Product characteristics

- thermal error in compensated range -20 ... 80 °C: 0.2 % FSO TC 0.02 % FSO / 10K
- communication interface for adjusting of offset, span and damping

Optional versions

- IS-versions
- Ex ia = intrinsically safe for gases and dusts
- adjustment of nominal pressure gauges (factory-provided)

CE Ex

The precision pressure transmitter DMP 331i and DMP 333i also the precision screw-in transmitter LMP 331i demonstrate the further development of our industrial pressure transmitters.

The signal processing of sensor signal is done by digital electronics with 16-bit analog digital converter. Consequently it is possible to conduct an active compensation and the transmitters with excellent maesurements and exeptionally attractive price to offer on the market.

Preferred areas of use are DMP 331i / DMP 333i

Laboratory Techniques

energy production (gas consumption and thermal energy measurement)

Preferred areas of use are LMP 331i

Environmental Engineering (water / sewage / recycling)

Chemical / petrochemical industry

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Pressure ranges DMP 331 i [1]								
Nominal pressure gauge / absolute	[bar]	0.4	1	2	4	10	20	40
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure	[bar]	3	7,5	15	25	50	120	210

[1] On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.

Vacuum ranges						
Nominal pressure	[bar]	-0.4 ... 0.4	-1 ... 1	-1 ... 2	-1 ... 4	-1 ... 10
Overpressure	[bar]	2	5	10	20	40
Burst pressure	[bar]	3	7.5	15	25	50

Pressure ranges DMP 333 i [1]						
Nominal pressure gauge / absolute	[bar]	60	100	200	400	600
Overpressure	[bar]	210	210	600	1050	1250
Burst pressure	[bar]	420	420	1000	1250	1250

[1] On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.

Pressure ranges LMP 331 i [1]								
Nominal pressure gauge / absolute	[bar]	0.4	1	2	4	10	20	40
Level gauge	[bar]	4	10	20	40	100	200	400
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure	[bar]	3	7.5	15	25	80	120	210

[1] On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 12 ... 36 V_{DC}
Option IS-protection	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}
Options	2-wire: 4 ... 20 mA with communication interface [2] 3-wire: 0 ... 10 V / V_S = 14 ... 36 V_{DC} 0 ... 10 V with communication interface [2]

[2] only possible with el. connection Binder series 723 (7-pin)

Performance	
Accuracy performance after turn-down - TD ≤ 1:5 - TD > 1:5	IEC 60770 [3]: ≤ ± 0.1 % FSO no change of accuracy [4] for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 3): ≤ ± [0.1 + 0.015 x turn-down] % FSO with turn-down = nominal pressure range / adjusted range 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_{max} = [(V_S – V_S min) / 0.02 A] Ω voltage 3-wire: R_{min} = 10 kΩ
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± (0.1 x turn-down) % FSO / year
Response time	approx. 200 msec
Adjustability	configuration of following parameters possible (interface / software necessary [5]): - electronic damping: 0 ... 100 sec - offset: 0 ... 90 % FSO - turn down of span: max. 1:10

[3] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)
[4] except nominal pressure ranges ≤ 0 .40 bar; for these calculation of accuracy is as follows:
≤ ± (0.1 + 0.02 x turn-down) % FSO e.g. turn-down of 1:3: ≤ ± (0.1 + 0.02 x 3) % FSO i.e. accuracy is ≤ ± 0.16 % FSO
[5] software, interface, and cable have to be ordered separately (software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or higher, and XP)

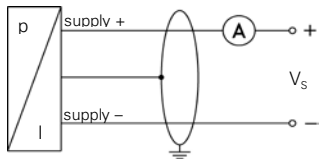
Thermal effects (Offset and Span) / Permissible temperatures		
Tolerance band	[% FSO]	≤ ± (0.2 x turn-down) in compensated range -20 ... 80 °C
TC, average	[% FSO / 10 K]	± (0.02 x turn-down) in compensated range -20 ... 80 °C
Permissible temperatures		medium: -25 ... 125 °C electronics / environment: -25 ... 85 °C storage: -40 ... 100 °C

Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326

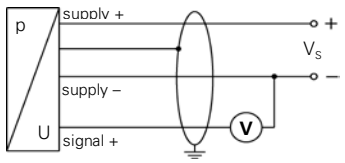
Materials	
Pressure port	stainless steel 1.4404 (316 L)
Housing	stainless steel 1.4404 (316 L)
Seals (media wetted)	DMP 331i / LMP 331i: FKM DMP 333i: NBR optional: welded version [6]; others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm
[6] welded version only with pressure ports according to EN 837; welded version not available with pressure ranges ≤ 0.16 bar and > 40 bar	
Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec.
Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approval DX19-DMP 331i	IBExU 10 ATEX 1068 X zone 0: II 1 G Ex ia IIC T4 Ga zone 20: II 1 D Ex ta IIIC T 85 °C, IP6x **in preparation**
Safety technical max. values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i ≈ 0 nF, L_i ≈ 0 µH
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar in zone 1 or higher: -25 ... 70 °C
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
Miscellaneous	
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 200 g
Installation position	any [7]
Operational life	> 100 x 10^6 pressure cycles
CE-conformity	EMC Directive: 2004/108/EC Pressure Equipment Directive: 97/23/EC (module A) [8]
[7] 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 ≤ 1 bar. *[8] This directive is only valid for devices with maximum permissible overpressure > 200 bar*	

Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



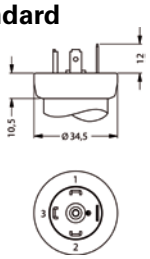
Pin configuration

Electrical connections		ISO 4400	Binder 723 (5-pin)	Binder 723 (7-pin)	M12x1/ metal (4-pin)	field housing	cable colours (DIN 47100)
Supply +		1	3	3	3	IN +	white
Supply –		2	4	1	1	IN –	brown
Signal + (only for 3-wire)		3	1	6	-	OUT +	green
shield		ground pin	5	2	4	⏚	yellow / green
Communication interface [9]	RxD	-	-	4	-	-	-
	TxD	-	-	5	-	-	-
	GND	-	-	7	-	-	-

[9] may not be transmitted directly with the PC (the suitable adapter is available as accessory)

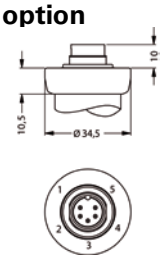
Electrical connections (dimensions in mm)

standard

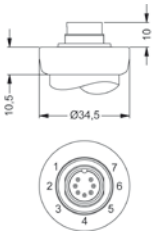


ISO 4400
(IP 65)

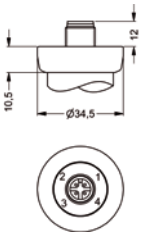
option



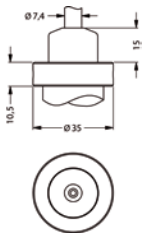
Binder Series 723 5-pin
(IP 67)



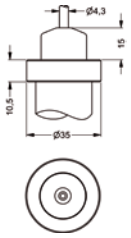
Binder Series 723 7-pin
(IP 67)



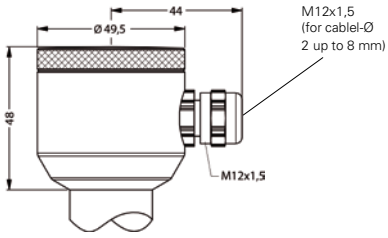
M12x1 4-pin
(IP 67)



cable outlet
(IP 68) [10]



cable gland
(IP 67) [11]

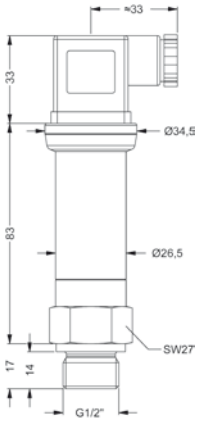


field housing
(IP 67)

[10] different cable types and lengths available, permissible temperature depends on kind of cable
[11] standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

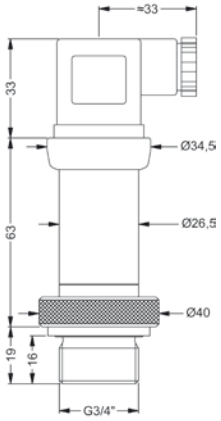
Mechanical connection (dimensions in mm)

standard DMP 331 i / DMP 333 i



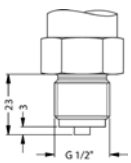
G1/2" DIN 3852

LMP 331 i

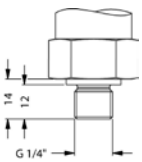


G3/4" DIN 3852

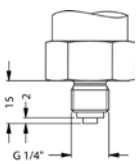
option for DMP 331 i and DMP 333 i



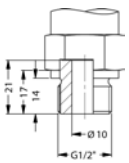
G1/2" EN 837



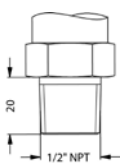
G1/4" DIN 3852



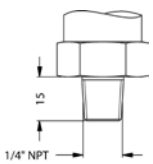
G1/4" EN 837



G1/2" open port



1/2" NPT



1/4" NPT

⇨ **metric threads and others on request**

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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 mH_2O		4 3 1	
Input [mH_2O]	[bar]		
For DMP 331i [2] or LMP 331i			
4	0.40	4 0 0 0	
10	1.0	1 0 0 1	
20	2.0	2 0 0 1	
40	4.0	4 0 0 1	
100	10	1 0 0 2	
200	20	2 0 0 2	
400	40	4 0 0 2	
For DMP 333i [2]			
	60	6 0 0 2	
	100	1 0 0 3	
	200	2 0 0 3	
	400	4 0 0 3	
	600	6 0 0 3	
For DMP 331i			
	-0.40 … 0.40	S 4 0 0	
	-1 … 1	S 1 0 2	
	-1 … 2	V 2 0 2	
	-1 … 4	V 4 0 2	
	-1 … 10	V 1 0 3	
customer		9 9 9 9	consult
Output			
4 … 20 mA / 2-wire		1	
Intrinsic safety 4 … 20 mA / 2-wire		E	
0 … 10 V / 3-wire		3	
customer		9	consult
Accuracy (at nominal pressure)			
0.1 %		1	
customer		9	consult
Electrical connection			
Male and female plug ISO 4400		1 0 0	
Male plug Binder series 723 (5-pin)		2 0 0	
Compact field housing stainless steel 1.4404 (316L)		8 5 0	
Male and female plug Binder series 723 (7-pin)		A 0 0	
Male plug M12x1 (4-pin) / metal		M 1 0	
Cable outlet with PVC cable [3]		T A 0	
Cable outlet [4]		T R 0	
customer		9 9 9	consult
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 flush sensor [5, 6]		F 0 0	
G1/2" DIN 3852 open pressure port [6]		H 0 0	
1/2" NPT		N 0 0	
1/4" NPT		N 4 0	
For LMP 331i			
G3/4" DIN 3852 with flush sensor		K 0 0	
customer		9 9 9	consult
Seals			
For DMP 331i or LMP 331i			
FKM		1	
without (welded version) [7]		2	
For DMP 333i			
NBR		5	
customer		9	consult
Special version			
standard		1 1 1	
RS-232 interface [8]		1 2 1	
customer		9 9 9	consult

[1] measurement starts with ambient pressure
[2] pressure ranges ≤ 40 bar as DMP 331i; pressure ranges > 40 bar as DMP 333i
[3] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 … 70 °C), optionally cable with ventilation tube
[4] cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable
[5] Mechanical connection G1/2" DIN 3852 flush impossible for vacuum ranges
[6] only possible for DMP 331i
[7] welded version only with pressure ports according to EN 837; not possible with pressure ranges ≤ 0.16 bar and > 40 bar
[8] 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
(Ordering code: CIS Set 510; Software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or newer and XP)
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