

DMP 331i / DMP333i LMP 331 i



Precision Pressure Transmitter / Screw-in transmitter

Stainless Steel Sensor

accuracy according to IEC 60770:
0.1 % FSO

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
- ▶ turn:down 1:10
- ▶ 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)

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

The signal of the sensor is processed by the intelligent digital electronics with 16-bit A/D converter which is able to do an active temperature compensation and linearization. Due to this we are able to offer the transmitters with excellent measurement parameters and exceptionally attractive price.

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



Chemical / petrochemical industry



Environmental Engineering
(water / sewage / recycling)



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	1000	1000
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	[mH ₂ O]	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 analog signal	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 5): ≤ ± [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. 5 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)					
Option field housing	stainless steel 1.4301 (304); cable gland M16x1.5, brass, nickel plated (clamping range 2 ... 8 mm)					
Seals	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) according to DIN EN 60068-2-6					
Shock	100 g / 11 msec according to DIN EN 60068-2-27					
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approvals	DX9-DMP 331i DX9-DMP 333i DX9-LMP 331i	IBExU10ATEX1122 X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 135°C Da				
Safety technical max. values	$U_i = 28$ V, $I_i = 93$ mA, $P_i = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ μ H, the supply connections have an inner capacity of max. 27 nF to the housing					
Ambient temperature range	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar in zone 1 or higher: -20 ... 65 °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 μ H/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 million load cycles					
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁸					
ATEX Directive	2014/34/EU					
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 $P_N \leq 1$ 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	1	IN +	wh (white)
supply -	2	4	1	2	IN -	bn (brown)
signal + (only for 3-wire)	3	1	6	3	OUT +	gn (green)
shield	ground pin	5	2	4	\perp	gn/ye (green/yellow)
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)

cable outlet with ventilation tube (IP 68)¹⁰

option

Binder Series 723 5-pin (IP 67)

cable outlet with PVC cable (IP 67)¹¹

Binder Series 723 7-pin (IP 67)

M12x1 4-pin (IP 67)

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

* for nominal pressure $P_N > 400$ bar increases the length of DMP 333i without IS-version by 19 mm and of DMP 333i with IS-version by 39 mm

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

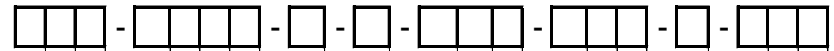
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Ordering code DMP 331i

3.4.2020

DMP 331i



	1	1	0																				
Pressure																							
Gauge (0,4...40 bar)	1	1	0																				
Absolute (0,4...40 bar)	1	1	1																				
Input [bar]																							
0 ... 0,4				4	0	0	0																
0 ... 1				1	0	0	1																
0 ... 2				2	0	0	1																
0 ... 4				4	0	0	1																
0 ... 10				1	0	0	2																
0 ... 20				2	0	0	2																
0 ... 40				4	0	0	2																
0 ... 60				6	0	0	2																
-0,4 ... 0,4				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																
Customer - underpressure				X	X	X	X																
Output																							
4...20 mA / 2-wire																				1			
0...10 V / 3-wire																				3			
Intrinsic safety Ex ia 4...20 mA / 2-wire																				E			
Intrinsic safety M1 Ex ia 4...20 mA / 2-wire (for mines)																				F			
Customer																				9			
Accuracy																							
0,1 % - standard range																				1			
0,1 % - standard range including Calibration Certificate																				P			
0,1 % - customer range																				I			
0,1 % - customer range including Calibration Certificate																				H			
0.2 % (P _N < 0,1 bar)																				B			
Customer																				9			
Electrical connection																							
Connector DIN 43650 (ISO 4400) (IP 65)																				1	0	0	
Connector Binder 723 5-pin (IP 67)																				2	0	0	
Cable gland PG7 / cable length specify (IP 67)																				4	0	0	
+ PVC cable / 1 m																							
Connector Buccaneer (IP 68)																				5	0	0	
Field housing stainless steel, cable gland M 16 x 1,5 (IP 67)																				8	0	0	
Field housing stainless steel, cable gland M 20 x 1,5 (IP 67)																				8	8	0	
Connector Binder 723 7-pin (IP 67) (for Interface RS 232)																				A	0	0	
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)																				E	0	0	
Connector M12 x 1, 4-pin (IP 67)																				M	0	0	
Connector M12 x 1, 4-pin (IP 67) - metal																				M	1	0	
Cable outlet, cable with ventilation tube (IP68)																				T	R	0	
+ PVC cable / 1 m																							
Customer																				9	9	9	
Mechanical connection																							
G 1/2" DIN 3852																					1	0	0
G 1/2" EN 837																					2	0	0
G 1/4" DIN 3852																					3	0	0
G 1/4" EN 837																					4	0	0
M 20 x 1,5 DIN 3852																					5	0	0
M 12 x 1 DIN 3852																					6	0	0



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M 10 x 1 DIN 3852	7	0	0				
M 20 x 1,5 EN 837	8	0	0				
G 1/2" DIN 3852 with flush sensor diaphragm	F	0	0				
M 20 x 1,5 DIN 3852 with flush sensor diaphragm	F	0	4				
1/2" NPT	N	0	0				
1/4" NPT	N	4	0				
Customer	9	9	9				
Seals							
Viton (FKM)				1			
Without seals - welded (only with EN 837-1/-3)				2			
EPDM				3			
Viton (FKM) up to -40°C				F			
Customer				9			
Special version							
Standard					1	1	1
Temperature compensation -30 ... 80°C (only with seals "F" or welded "2")					1	1	2
Interface RS 232 (only for connector Binder 723 7-pin)					1	2	1
Customer					9	9	9
Software for set up on site							
Communication module ADAPT-1 (RS 232 for DMP 331i, DMP 333i) INT-501							
Communication module ADAPT-5 (RS 232 / USB for DMP 331i, DMP 333i) + software							
Software for DMP 331i, 333i / update code 503498							
Assembly (module + software for DMP 331i, 333i) ADAPT-1, INT-502							

0,-...without additional charge

On request...in accordance with the producer

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Ordering code DMP 333i

3.4.2020

DMP 333i

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Pressure												
Gauge	1	3	0									
Absolute	1	3	1									
Input [bar]												
0 ... 60				6	0	0	2					
0 ... 100				1	0	0	3					
0 ... 200				2	0	0	3					
0 ... 400				4	0	0	3					
0 ... 600				6	0	0	3					
Customer				9	9	9	9					
Output												
4...20 mA / 2-wire								1				
0...10 V / 3-wire								3				
Intrinsic safety Ex ia 4...20 mA /2-wire								E				
Intrinsic safety M1 Ex ia 4 ... 20 mA / 2-wire (for mines)								F				
Customer								9				
Accuracy												
0,1 % - standard range								1				
0,1 % - standard range including Calibration Certificate								P				
0,1 % - customer range								I				
0,1 % - customer range including Calibration Certificate								H				
0,2 % (P _N < 0,1 bar)								B				
Customer								9				
Electrical connection												
Connector DIN 43650 (ISO 4400) (IP 65)								1	0	0		
Connector Binder 723 5-pin (IP 67)								2	0	0		
Cable gland PG7 / cable length specify (IP 67)								4	0	0		
+ PVC cable / 1 m												
Connector Buccaneer (IP 68)								5	0	0		
Field housing stainless steel, cable gland M 16 x 1,5 (IP 67)								8	0	0		
Field housing stainless steel, cable gland M 20 x 1,5 (IP 67)								8	8	0		
Connector Binder 723 7-pin (IP 67) (for Interface RS 232)								A	0	0		
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)								E	0	0		
Connector M12 x 1, 4-pin (IP 67)								M	0	0		
Connector M12 x 1, 4-pin (IP 67) - metal								M	1	0		
Cable outlet, cable with ventilation tube (IP68)								T	R	0		
+ PVC cable / 1 m												
Customer								9	9	9		
Mechanical connection												
G 1/2" DIN 3852								1	0	0		
G 1/2" EN 837								2	0	0		
G 1/4" DIN 3852								3	0	0		
G 1/4" EN 837								4	0	0		
M 20 x 1,5 DIN 3852								5	0	0		
M 12 x 1 DIN 3852								6	0	0		
M 10 x 1 DIN 3852								7	0	0		
M 20 x 1,5 EN 837								8	0	0		
G1/2" DIN 3852 with flush sensor								F	0	0		
G1/2" DIN 3852 open pressure port								H	0	0		
1/2" NPT								N	0	0		
1/4" NPT								N	4	0		
Customer								9	9	9		
Seals												
Viton (FKM)										1		
Without seals - welded (only with EN 837-1/-3; only for P _N < 170 bar)										2		
EPDM (P _N < 160 bar)										3		
NBR (standard)										5		
Customer										9		
Special version												
Standard										1	1	1



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Interface RS 232 (only for connector Binder 723-7-pin)

1 | 2 | 1

Customer

9 | 9 | 9

Software for the intelligent pressure transmitters

Communication module ADAPT-1 (RS 232 for DMP 331i, DMP 333i), INT-501

Communication module ADAPT-5 (RS 232 / USB for DMP 331i, DMP 333i) + software

Software for DMP 331i, 333i / update code 503498

Assembly (module + software for DMP 331i, 333i) ADAPT-1, INT-502

0,-...without additional charge

On request...in accordance with the producer

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Ordering code LMP 331i

3.4.2020

LMP 331i

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Pressure																					
in bar		4	3	0																	
in m H ₂ O		4	3	1																	
Input	[mH ₂ O]	[bar]																			
	0 ... 4	0 ... 0,4	4	0	0	0															
	0 ... 10	0 ... 1	1	0	0	1															
	0 ... 20	0 ... 2	2	0	0	1															
	0 ... 40	0 ... 4	4	0	0	1															
	0 ... 100	0 ... 10	1	0	0	2															
	0 ... 200	0 ... 20	2	0	0	2															
	0 ... 400	0 ... 40	4	0	0	2															
Customer			9	9	9	9															
Housing material																					
Stainless steel 1.4404 (316 L)																					1
Diaphragm material																					
Stainless steel 1.4435 (316 L)																					1
Output																					
4 ... 20 mA / 2-wire																					1
0 ... 10 V / 3-wire ¹																					3
Intrinsic safety Ex ia 4 ... 20 mA / 2-wire																					E
Intrinsic safety M1 Ex ia 4 ... 20 mA / 2-wire (for mines)																					F
Customer																					9
Accuracy																					
0,1 % - standard range																					1
0,1 % - standard range including Calibration Certificate																					P
0,1 % - customer range																					I
0,1 % - customer range including Calibration Certificate																					H
0,2 % (P _N < 0,1 bar)																					B
Customer																					9
Electrical connection																					
Connector DIN 43650 (ISO 4400) (IP 65)																					1 0 0
Connector ISO 4400 (IP 65) + silicone seals for Ex nA																					1 0 5
Connector Binder Serie 723 5-pin (IP 67)																					2 0 0
Cable gland PG7 / cable length specify (IP 67)																					4 0 0
+ PVC cable / 1 m																					
Connector Buccaneer (IP 68)																					5 0 0
Field housing stainless steel, cable gland M 16 x 1,5 (IP 67)																					8 0 0
Field housing stainless steel, cable gland M 20 x 1,5 (IP 67)																					8 8 0
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)																					E 0 0
Connector Binder 723 7-pin (IP 67) (for Interface RS 232)																					A 0 0
Connector M12 x 1, 4-pin (IP 67)																					M 0 0
Connector M12 x 1, 4-pin (IP 67) - metal																					M 1 0
Cable outlet, cable with ventilation tube (IP68)																					T R 0
+ PVC cable / 1 m																					
Customer																					9 9 9
Mechanical connection																					
G 3/4" DIN 3852																					K 0 0
Customer																					9 9 9
Electrical connection																					
Viton (FKM)																					1
EPDM																					3
Customer																					9
Special version																					
Standard																					1 1 1
Interface RS 232 (only for connector Binder Serie 723 7-pin)																					1 2 1
Customer																					9 9 9



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0,...without additional charge On request...in accordance with the producer

1 - maximum length of PVC cable – 25 m, PUR, FEP, TPE – 40 m

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