

DMP 331i DMP 333i

Precision Pressure 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 demonstrate the further development of our industrial pressure transmitters.

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

Preferred areas of use are



Laboratory Techniques



Energy production (gas consumption
and thermal energy measurement)



Pressure ranges DMP 331 i ¹										
Nominal pressure gauge / absolute	[bar]	0.4	1	2	4	10	20	40	60	
Overpressure	[bar]	2	5	10	20	40	80	105	105	
Burst pressure	[bar]	3	7.5	15	25	50	120	210	210	
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]	100		200		400		600		
Overpressure	[bar]	210		600		1000		1000		
Burst pressure	[bar]	420		1000		1250		1250		
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 analogue 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	IEC 60770 ³ : ≤ ± 0.1 % FSO - TD ≤ 1:5 no change of accuracy ⁴ - TD > 1:5 for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 4): ≤ ± [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 at reference conditions									
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)									
Seals	FKM; NBR welded version ⁶ others on request									
Diaphragm	stainless steel 1.4435 (316L)									
Media wetted parts	pressure port, seal, diaphragm									
⁶ welded version only with pressure ports according to EN 837; welded version not available with pressure ranges > 60 bar										

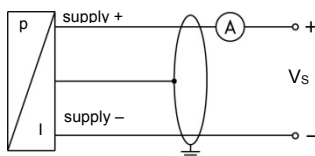
Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec.
Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approvals DX19-DMP 331i DX19-DMP 333i	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da
Safety technical max. values	$U_i = 28\text{ V}$, $I_i = 93\text{ mA}$, $P_i = 660\text{ mW}$, $C_i \approx 0\text{ nF}$, $L_i \approx 0\text{ }\mu\text{H}$, 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 $\mu\text{H}/\text{m}$
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: 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 $P_N \leq 1\text{ bar}$.

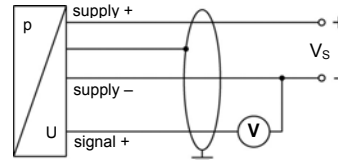
⁸ This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)

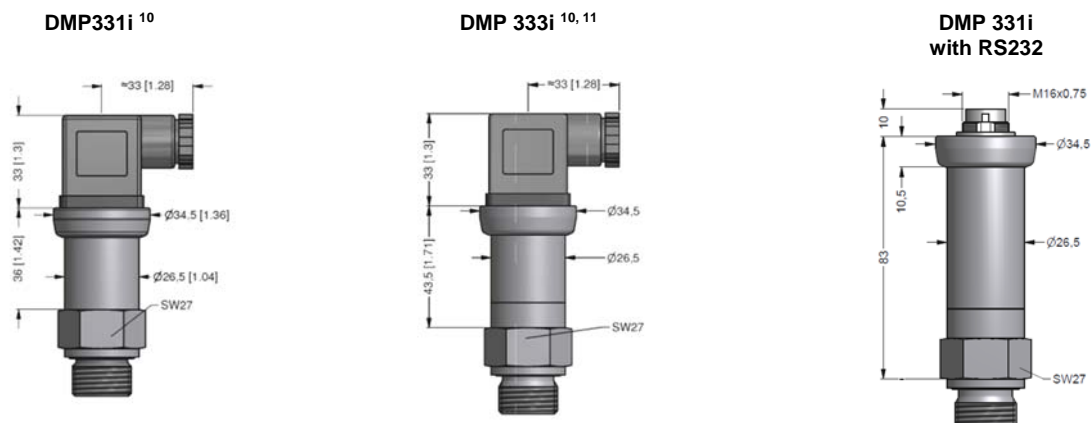


Pin configuration

Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723 (7-pin)	M12x1 / metal (4-pin)	Bayonet MIL-C-26482 (10-6)		field housing	cable colours (IEC 60757)
					2-wire	3-wire		
supply +	1	3	3	1	A	A	IN +	wh (white)
supply -	2	4	1	2	B	D	IN -	bn (brown)
signal + (only for 3-wire)	3	1	6	3	-	B	OUT +	gn (green)
shield	ground pin	5	2	4	pressure port		\perp	gnye (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)

Dimensions (mm / in)



¹⁰ with electrical connection Bayonet MIL-C-26482 (10-6) increases the length of devices by 5 mm

¹¹ for nominal pressure $P_N > 400\text{ bar}$ increases the length without IS-version by 19 mm and with IS-version by 39 mm

Electrical connections (dimensions mm / in)

standard	optional					
<p>ISO 4400 (IP65)</p>	<p>M12x1 4-pin (IP 67)</p>	<p>Binder series 723 5-pin (IP 67)</p>	<p>Binder series 723 7-pin (IP 67)</p>	<p>Bayonet MIL-C-26482 (10-6) (IP 67)</p>		
	<p>cable outlet, with PVC cable (IP 67)¹²</p>	<p>cable outlet, cable with ventilation tube (IP 68)¹³</p>	<p>compact field housing (IP 67)</p>			
<p>⇒ universal-field housing stainless steel 316L with cable gland M20x1.5 (ordering code 880) and other versions on request</p>						
<p>¹² standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C); others on request ¹³ different cable types and lengths available, permissible temperature depends on kind of cable</p>						
Mechanical connection (dimensions in mm / inch)						
<p>G1/2" DIN 3852</p>	<p>G1/4" DIN 3852</p>	<p>G1/2" EN 837</p>	<p>G1/4" EN 837</p>	<p>G1/2" open port, P_N ≤ 40 bar</p>	<p>1/2" NPT</p>	<p>1/4" NPT</p>
<p>⇒ metric threads and others on request</p>						
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Ordering code DMP 331i/ DMP 333i

DMP 331i/ DMP 333i

□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Pressure		[mH ₂ O]		[bar]																				
For DMP 331i																								
	gauge	1	1	0																				
	absolute	1	1	1																				
For DMP 333i																								
	gauge ¹	1	3	0																				
	absolute	1	3	1																				
Input		[mH ₂ O]		[bar]																				
For DMP 331i²																								
	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																
	600	60			6	0	0	2																
For DMP 333i²																								
	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 for analog output																		M	1	0			
	Male plug M12x1 (4-pin) / metal for digital output																		M	1	3			
	Bayonet MIL-C-26482 (10-6); 2 wire																		B	G	0			
	Bayonet MIL-C-26482 (10-6); 3 wire																		B	G	4			
	Cable outlet with PVC cable ³																		T	A	0			
	Cable outlet ⁴																		T	R	0			
	customer																		9	9	9			
consult																								
Mechanical connection																								
	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 ⁵ flush sensor																		F	0	0			
	G1/2" DIN 3852 open pressure port ⁵																		H	0	0			
	1/2" NPT																		N	0	0			
	1/4" NPT																		N	4	0			
	customer																		9	9	9			
consult																								
Seals																								
For DMP 331i																								
	FKM																		1					
	without (welded version) ^{5,6}																		2					
For DMP 333i																								
	FKM																		1					
	NBR																		5					
	customer																		9					
consult																								
Special version																								
	standard																		1	1	1			
	RS-232 interface ⁷																		1	2	1			
	customer																		9	9	9			
consult																								

¹ measurement starts with ambient pressure
² pressure ranges ≤ 60 bar as DMP 331i; pressure ranges > 60 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 only possible for DMP 331i and P_N ≤ 40 bar
⁶ welded version only with pressure ports according to EN 837
⁷ RS-232 interface only possible with el. connection Binder serie 723 (7pin)
 Software, Interface and cable for DMP 331i and DMP 333i with option RS-232 have to be order separately
 (Ordering code: CIS-G; Software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or newer and XP)

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