



# DMP 331i DMP 333i

## Precision Pressure Transmitter

Stainless Steel Sensor

accuracy according to IEC 60770:  
0.1 % FSO

### Nominal pressure

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

### Output signal

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2-wire: 4 ... 20 mA

3-wire: 0 ... 10 V

others on request

### Product characteristics

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- ▶ 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

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- ▶ IS-versions  
Ex ia = intrinsically safe  
for gases and dusts
- ▶ adjustment of nominal pressure  
ranges (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

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Laboratory techniques



Energy production (gas consumption  
and thermal energy measurement)



Pressure ranges DMP 331i <sup>1</sup>									
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 gauge	[bar]	-0.4 ... 0.4		-1 ... 1		-1 ... 2		-1 ... 4	
Overpressure	[bar]	2		5		10		20	
Burst pressure	[bar]	3		7.5		15		25	
Pressure ranges DMP 333i <sup>1</sup>									
Nominal pressure gauge / absolute	[bar]	100			200		400		600
Overpressure	[bar]	210			600		1000		1000
Burst pressure	[bar]	420			1000		1250		1250
<sup>1</sup> 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 <sub>S</sub> = 12 ... 36 V <sub>DC</sub>							
Option IS-version		2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>							
Options analogue signal		2-wire: 4 ... 20 mA with communication interface <sup>2</sup>							
		3-wire: 0 ... 10 V / V <sub>S</sub> = 14 ... 36 V <sub>DC</sub> 0 ... 10 V with communication interface <sup>2</sup>							
<sup>2</sup> only possible with el. connection Binder series 723 (7-pin)									
Performance									
Accuracy		IEC 60770 <sup>3</sup> : ≤ ± 0.1 % FSO							
performance after turn-down		no change of accuracy <sup>4</sup>							
- TD ≤ 1:5		for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 4):							
- TD > 1:5		≤ ± [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 <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] 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 turn-down) % FSO / year at reference conditions							
Response time		approx. 5 msec							
Adjustability (with option communication interface RS232)		configuration of following parameters possible (interface / software necessary <sup>5</sup> ): electronic damping: 0 ... 100 sec      offset: 0 ... 90 % FSO      turn down of span: max. 1:10							
<sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)									
<sup>4</sup> 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									
<sup>5</sup> 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 compact field housing		stainless steel 1.4301 (304); cable gland M12x1.5, brass, nickel plated (clamping range 2 ... 8 mm)							
Seals		FKM NBR welded version <sup>6</sup>				others on request			
Diaphragm		stainless steel 1.4435 (316L)							
Media wetted parts		pressure port, seal, diaphragm							
<sup>6</sup> 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)				according to DIN EN 60068-2-6			
Shock		100 g / 11 msec.				according to DIN EN 60068-2-27			

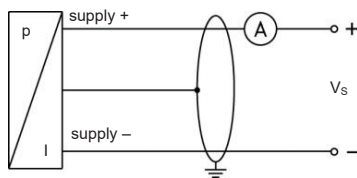
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approvals	DX19-DMP 331i DX19-DMP 333i	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIC T135 °C Da
Safety technical max. values	$U_i = 28\text{ V}$ , $I_i = 93\text{ mA}$ , $P_i = 660\text{ mW}$ , $C_i \approx 0\text{ nF}$ , $L_i \approx 0\text{ }\mu\text{H}$ , the supply connections have an inner capacity of max. 27 nF to the housing	
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with $p_{\text{atm}}$ 0.8 bar up to 1.1 bar in zone 1 or higher: -40/-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 <sup>7</sup>	
Operational life	100 million load cycles	
CE-conformity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) <sup>8</sup>
ATEX Directive	2014/34/EU	

<sup>7</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  $p_N \leq 1\text{ bar}$ .

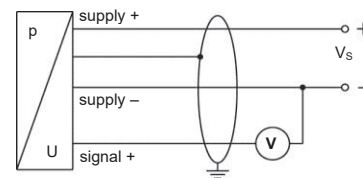
<sup>8</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar.

### Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



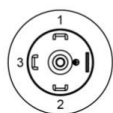
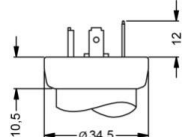
### Pin configuration

Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723 (7-pin)	M12x1/metal (4-pin)	Bayonet MIL-C-26482 (10-6)		compact 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			GNYE (green-yellow)
Communication interface RS232 <sup>9</sup>	RxD	-	4	-	-	-	-	-
	TxD	-	5	-	-	-	-	-
	GND	-	7	-	-	-	-	-

<sup>9</sup> may not be transmitted directly with the PC (the suitable adapter is available as accessory)

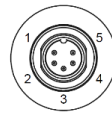
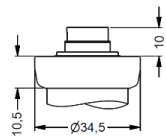
### Electrical connections (dimensions in mm)

#### standard

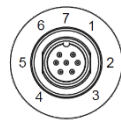
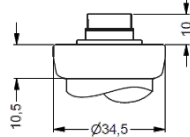


ISO 4400 (IP 65)

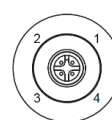
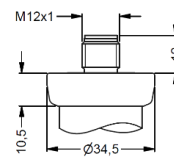
#### options



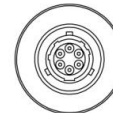
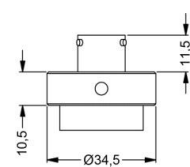
Binder series 723, 5-pin (IP 67)



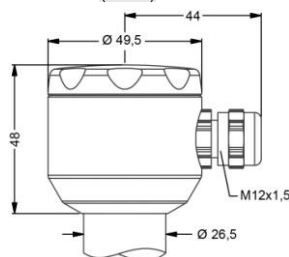
Binder series 723, 7-pin (IP 67)



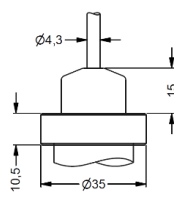
M12x1, 4-pin (IP 67)



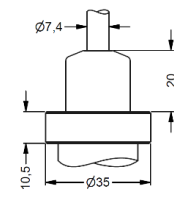
Bayonet MIL-C-26482 (10-6) (IP 67)



compact field housing (IP 67)



cable outlet with PVC cable (IP 67)<sup>10</sup>



cable outlet, cable with ventilation tube (IP 68)<sup>11</sup>

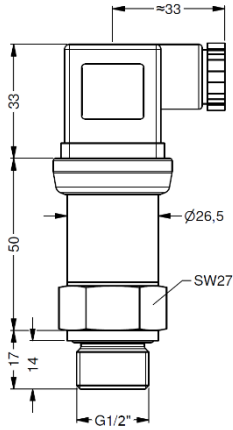
⇒ universal-field housing stainless steel 316L with cable gland M20x1.5 (ordering code 880) and other versions on request

<sup>10</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)

<sup>11</sup> different cable types and lengths available, permissible temperature depends on kind of cable

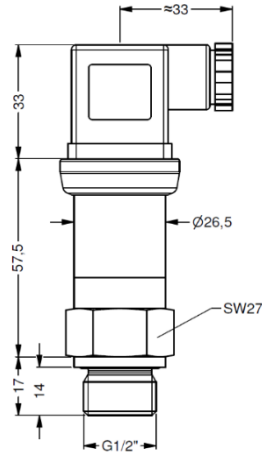
**Mechanical connections (dimensions in mm)**

**DMP331i**<sup>12</sup>



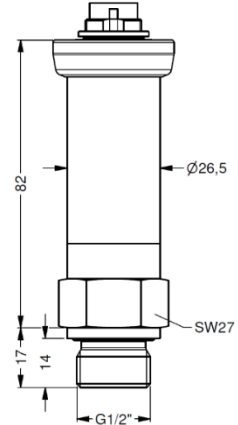
G1/2" DIN 3852

**DMP 333i**<sup>12, 13</sup>



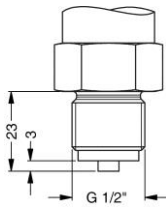
G1/2" DIN 3852

**DMP 331i**  
with communication interface RS232

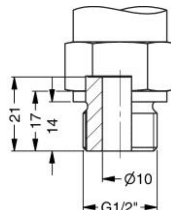


G1/2" DIN 3852

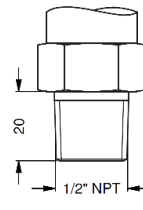
**Optional**



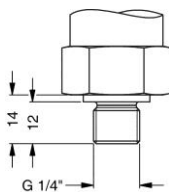
G1/2" EN 837



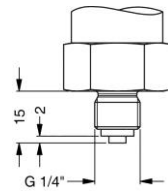
G1/2" DIN 3852  
open port,  $p_N \leq 40$  bar



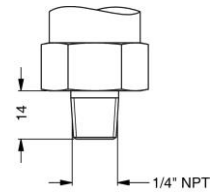
1/2" NPT



G1/4" DIN 3852



G1/4" EN 837



1/4" NPT

↪ metric threads and others on request

<sup>12</sup> with electrical connection Bayonet MIL-C-26482 (10-6) increases the length of devices by 5 mm

<sup>13</sup> for nominal pressure  $p_N > 400$  bar increases the length without IS-version by 19 mm and with IS-version by 39 mm

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## Ordering code DMP 331i / DMP 333i

DMP 331i / DMP 333i

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Pressure		[mH <sub>2</sub> O]		[bar]																	
<b>For DMP 331i</b>		gauge	1	1	0																
		absolute	1	1	1																
<b>For DMP 333i</b>		gauge <sup>1</sup>	1	3	0																
		absolute	1	3	1																
Input		[mH <sub>2</sub> O]		[bar]																	
<b>For DMP 331i<sup>2</sup></b>		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														
<b>For DMP 333i<sup>2</sup></b>		100		1	0	0	3														
		200		2	0	0	3														
		400		4	0	0	3														
		600		6	0	0	3														
<b>For DMP 331i</b>		-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 % FSO					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												
		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 (IP67) <sup>3</sup>					T	A	0												
		cable outlet, cable with ventilation tube (IP68) <sup>4</sup>					T	R	0												
		compact field housing stainless steel 1.4301 (304)					8	5	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 flush sensor <sup>5</sup>					F	0	0												
		G1/2" DIN 3852 open pressure port <sup>5</sup>					H	0	0												
		1/2" NPT					N	0	0												
		1/4" NPT					N	4	0												
		customer					9	9	9	consult											
Seals																					
<b>For DMP 331i</b>		FKM					1														
		without (welded version) <sup>5,6</sup>					2														
<b>For DMP 333i</b>		FKM					1														
		NBR					5														
		customer					9	consult													
Special version																					
		standard					1	1	1												
		communication interface RS232 <sup>7</sup>					1	2	1												
		customer					9	9	9	consult											

<sup>1</sup> measurement starts with ambient pressure  
<sup>2</sup> pressure ranges ≤ 60 bar as DMP 331i; pressure ranges > 60 bar as DMP 333i  
<sup>3</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request  
<sup>4</sup> code TR0 = PVC cable, cable with ventilation tube available in different types and lengths  
<sup>5</sup> only possible for DMP 331i and P<sub>N</sub> ≤ 40 bar  
<sup>6</sup> welded version only with pressure ports according to EN 837  
<sup>7</sup> Communication interface RS232 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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