



# **DMP 331Pi**

## **Precision Pressure Transmitter**

pressure ports and process connections with flush welded stainless steel diaphragm

accuracy according to IEC 60770: 0,1 % FSO

#### **Nominal pressure**

from 0 ... 400 mbar up to 0 ... 40 bar

#### **Output signals**

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

#### **Product characteristics**

- excellent temperature response 0.04 % FSO / 10K
- Turn-Down 1:10
- processing of the sensor signal using digital electronics
- process connections suitable for hygienic application
- vacuum resistant

#### **Optional versions**

- IS-version Ex ia = intrinsically safe for gases and
- communication interface for adjustment of offset, span and damping

The precision pressure transmitter DMP 331Pi demonstrates the further development of welltried industrial pressure transmitter DMP 331P.

signal from the specially designed piezoresistive stainless steel sensor is processed by the newly developed digital electronic system, performing thus an active compensation of sensor-specific deviations such as hysteresis, thermal errors and non-linearity.

The temperature range of -40 ... 125 °C can be extended by the integration of a cooling element up to 300 °C.

#### Preferred areas of use are



Laboratory techniques



Food and beverage



Pharmaceutical industry





















Pressure ranges <sup>1</sup>								
Nominal pressure		0.4	1	2	4	10	20	40
gauge / absolute 2	[bar]	-				_		
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure ≥	[bar]	3	7,5	15	25	50	120	210
Vacuum resistance		P <sub>N</sub> ≥ 1 bar: u P <sub>N</sub> < 1 bar: o	nlimited vacuu	um resistanc	е			
<sup>1</sup> On customer request we a <sup>2</sup> absolut pressure permissib		device within the t		bility by softwa	are on the require	ed 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	
Output signal / Supply								
Standard		2-wire: 4 2	0 mA / Vs	- 12 36 V				
Option IS-protection			0 mA / V <sub>S</sub>					
Options		2-wire: 4 2 3-wire: 0 1	0 mA with cor	nmunication = 14 36 V				
			0 V / V <sub>S</sub> 0 V with comr					
<sup>3</sup> only possible with el. conne	ection Bi							
Performance		( ,	,					
Accuracy <sup>4</sup>		IEC 60770: ≤ ±	0.1 % FSO					
performance after turn-de	OWD		27.701.00					
- TD ≤ 1:5	OWII	no change of a	ccuracy 5					
- TD > 1:5		•	ng formula (1	for nominal pre	essure ranges ≤	0 40 bar see	e note 5).	
		≤ ± [0.1 + 0.015	x turn-down]	% FSO	o. Hommar pro	.ccaro rangoo =	J. 10 Dai 000	
		with turn-down	-		/ adjusted range	ge		
		e.g. with a turn-	•	-	•	•		
		≤ ± (0.1 + 0.015						
Permissible load		current 2-wire:	$R_{max} = [(V_S -$	V <sub>S</sub> min) / 0.0	02 A] Ω voltag	ge 3-wire: R <sub>min</sub> =	10 kΩ	
Influence effects		117	5 % FSO / 10			5 % FSO / kΩ		
Long term stability ≤ ± (0.1 x turn-down) % FSO / year at ref				reference conditions				
Response time		< 5 msec						
Adjustability configuration of following parameters possible (interface / software necessary <sup>6</sup> ):								
Adjustability					sible (Illiellace	/ Software nece	ssary ):	
Adjustability		- electronic dan	nping: 0 10		sible (lilleriace	/ software nece	ssary ):	
Adjustability		- electronic dan - offset: 0 90	nping: 0 10 % FSO	0 sec	sible (iliteriace	/ sollware nece	ssary ):	
, ,	60770 -	- electronic dan - offset: 0 90 - turn down of s	nping: 0 10 % FSO span: max. 1:	0 sec	·	/ software nece	ssary ):	
Adjustability  4 accuracy according to IEC 5 except nominal pressure ra	60770 – angeș ≤ (	- electronic dan - offset: 0 90 - turn down of s	nping: 0 10 % FSO span: max. 1: <sup>2</sup> ent (non-lineari	0 sec	repeatability)	/ software nece	ssary ):	
<sup>4</sup> accuracy according to IEC <sup>5</sup> except nominal pressure ra ≤ ± (0.1 + 0.02 x turn-down	angeș≤ ( n) % FSC	- electronic dan - offset: 0 90 - turn down of s - limit point adjustm 0 .40 bar; for these 0 e.a. turn-down of	nping: 0 10 % FSO span: max. 1: ent (non-linearic calculation of a 1:3: ≤ ± (0.1 + 0	0 sec  10  ty, hysteresis, ccuracy is as is 0.02 x 3 ) % FS	repeatability) follows: SO i.e. accuracy	is≤± 0.16 % FSO		who are and MDI
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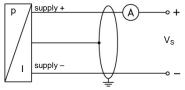
Materials						
Pressure port	stainless steel 1.4435 (316 L) others on request					
Housing	stainless steel 1.4404 (316 L)					
Option compact field housing	stainless steel 1.4305 (303), cable gland brass, nickel plated others on request					
Seals (O-ring)	standard: FKM (recommended for medium temperatures ≤ 200 °C)					
	option: FFKM (recommended for medium temperatures > 200 °C)					
	others on request					
	clamp, dairy pipe, Varivent®: without					
Diaphragm	standard: stainless steel 1.4435 (316L) option: Hastelloy® C-276 (2.4819) and Tantalum on request					
Media wetted parts	pressure port, diaphragm					
Explosion protection (only for	4 20 mA / 2-wire)					
Approvals	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X					
DX 19-DMP 331Pi	zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da					
Safety technical maximum val-	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i \approx 0 \text{ nF}, L_i \approx 0  \mu\text{H},$					
ues	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 <sub>atm</sub> 0.8 bar up to 1.1 bar					
	in zone 1 or higher: -20 70 °C					
Connecting cables	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m					
(by factory)	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						
Installation position	approx. 200 g					
Operational life	> 100 x 10 <sup>6</sup> pressure cycles					
CE-conformity	EMC Directive: 2014/30/EU					
ATEX Directive	2014/34/EU					
10 Property transmitters are calibrate	in a vertical position with the pressure connection down. If this position is changed an installation there can be slight					

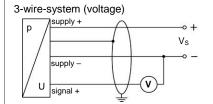
<sup>10</sup> Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges  $P_N \le 1$  bar.

### Wiring diagrams

2-wire-system (current)







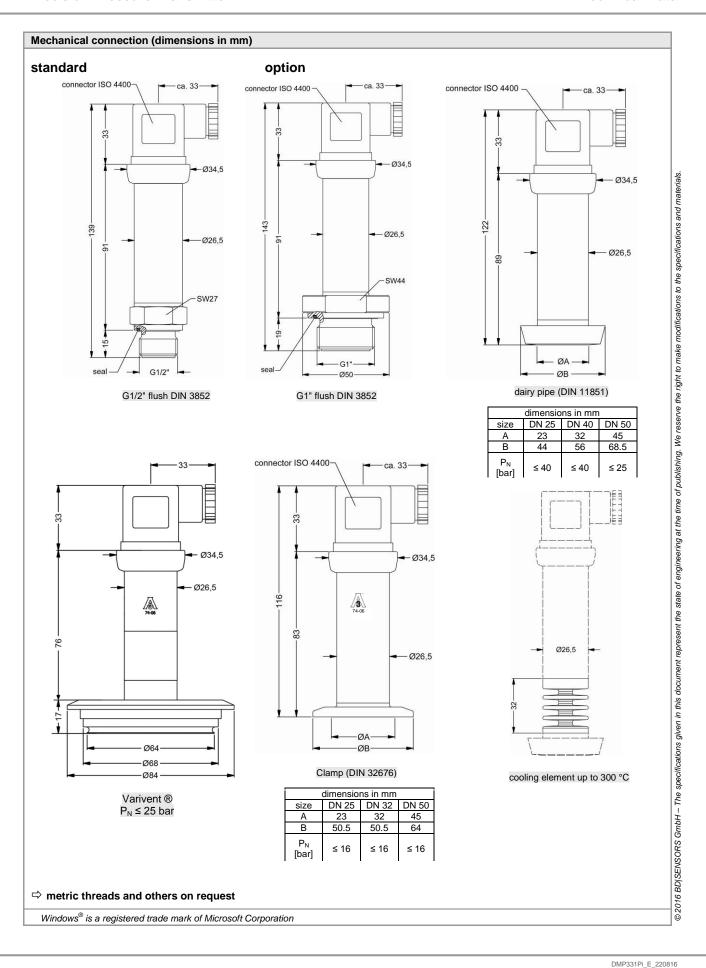
Pin configuration							
Electrical connections		ISO 4400	Binder 723 (5-pin)	Binder 723 (7-pin)	M12x1/ metal (4-pin)	field housing	cable colour (IEC 60757)
Supply +		1	3	3	1	IN +	wh (white)
Supply –		2	4	1	2	IN –	bn (brown)
Signal + (only for 3-wire)		3	1	6	3	OUT +	gn (green)
	shield	ground pin	5	2	4	Ŧ	gnye (green- yellow)
Communication	RxD	-	-	4	-	-	-
interface 11	TxD	=	-	5	-	-	-
	GND	-	-	7	-	-	-

<sup>&</sup>lt;sup>11</sup> may not be connected directly with the PC (the suitable adapter is available as accessory)

#### Electrical connections (dimensions in mm)

#### option standard Ø 26,5 cable outlet 12 cable outlet 13, with ISO 4400 M12x1 field housing Binder 723 Binder 723 (IP 65) 5-pin (IP 67) 7-pin (IP 67) 4-pin (IP 67) (IP 67) PVC cable (IP 67) ventilation tube (IP 68)

 $<sup>^{12}</sup>$  standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)  $^{13}$  different cable types and lengths available, permissible temperature depends on kind of cable





#### Ordering code DMP 331Pi DMP 331Pi Pressure 5 0 0 5 0 1 gauge absolute Input 4 0 0 0 1 0 0 1 0.40 1.0 2.0 2 0 0 1 4 0 0 0 0 0 2 10 2 0 0 2 4 0 0 2 20 40 S 4 0 0 S 1 0 2 V 2 0 2 V 4 0 2 V 1 0 3 -0.40 ... 0.40 -1 ... 1 -1 ... 2 -1 ... 4 -1 ... 10 customer 9 9 9 9 consult 4 ... 20 mA / 2-wire Intrinsic safety 4 ... 20 mA / 2-wire F 0 ... 10 V / 3-wire 3 customer 9 consult Accuracy 0.1% customer consult Electrical c Male and female plug ISO 4400 Male plug Binder series 723 (5-pin) 1 0 0 2 0 0 A 0 0 T A 0 T R 0 M 1 0 Male plug Binder series 723 (7-pin) <sup>2</sup> Cable outlet with PVC-cable 3 Cable outlet 4 Male plug M12x1 (4-pin) / metal Compact field housing 8 5 0 stainless steel 1.4305 9 9 9 customer consult Mechanical connection G1/2" with flush welded diaphragm (DIN 3852) <sup>6</sup> G1" with flush Z 0 0 Z 3 1 welded diaphragm (DIN 3852) Clamp DN 25 / 1" (DIN 32676) / 3A Clamp DN 32 / 1 1/2" (DIN 32676) / 3A C 6 1 C 6 2 C 6 3 Clamp DN 50 / 2" (DIN 32676) / 3A Clamp 3/4" (DIN 32676) / 3A Dairy pipe DN 25 (DIN 11851) <sup>5</sup> C 6 9 M 7 3 Dairy pipe DN 40 (DIN 11851) Wer Dairy pipe DN 50 (DIN 11851) 5 time of publishing. Varivent® DN 40/50 / 3A customer P 4 1 9 9 consult Diaphragm Stainless steel 1.4435 (316L) Hastelloy® C-276 (2.4819) Tantalum state of engineering at the consult customer consult for clamp or dairy pipe: without 0 for inch thread - standard: FKM for inch thread - option: FFKM customer 9 consult Filling Fluids the silicone oil food compatible oil customer consult Special version

absolut pressure possible from 1 bar

standard: 2 m PVC cable without ventilation tube (permissible temperature: -5  $\dots$  70 °C), others on request

standard RS-232 interface 7

customer

cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

The cup nut has to be mounted by production of pressure transmitter with electrical connection field housing and mechanical connection dairy pipe.

The cup nut has to be ordered as separate position.

possible only for P<sub>N</sub> ≥ 1 bar

RS-232 interface only possible with el. connection Binder series 723 (7-pin)

with cooling element up to 300 °C RS-232 interface and

cooling element up to 300 °C 7

Software, Interface and cable for DMP 331 Pi 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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