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 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

- Laboratory techniques
- Energy production (gas consumption and thermal energy measurement)

BD SENSORS GmbH
BD-Sensors-Straße 1
D - 95199 Thierstein

Tel.: +49 (0) 92 35 / 98 11- 0
Fax: +49 (0) 92 35 / 98 11- 11

www.bdsensors.de
info@bdsensors.de

Pressure ranges DMP 331i [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 gauge	[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 333i [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-version	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	IEC 60770 [3]: ≤ ± 0.1 % FSO
performance after turn-down - TD ≤ 1:5 - TD > 1:5	 no change of accuracy [4] 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 (with option communication interface RS232)	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)		
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 [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 and NPT; welded version not available with pressure ranges > 60 bar

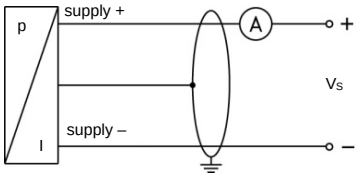
Mechanical stability		
Vibration	10 g RMS (20 ... 2000 Hz)	according to DIN EN 60068-2-6
Shock	100 g / 11 msec.	according to DIN EN 60068-2-27
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approvals DX19-DMP 331i DX19-DMP 333i	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da	
Safety technical max. values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i ≈ 0 nF, L_i ≈ 0 µH, 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_{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: 1µH/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 ≤ 1 bar.

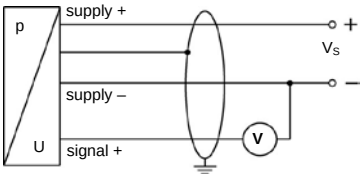
[8] This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams

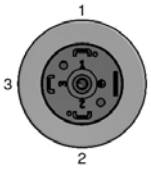
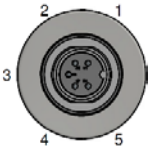
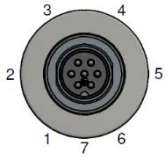
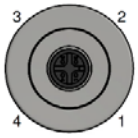
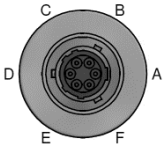
2-wire-system (current)



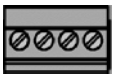
3-wire-system (voltage)



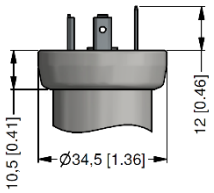
Pin configuration

Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723/423 (7-pin)	M12x1 / metal (4-pin)	Bayonet MIL-C-26482 (10-6)	
						
					2-wire	3-wire
Supply +	1	3	3	1	A	A
Supply –	2	4	1	2	B	D
Signal + (only for 3-wire)	3	1	6	3	-	B
Communication interface RS232 [9] RxD	-	-	4	-	-	-
TxD	-	-	5	-	-	-
GND	-	-	7	-	-	-
Shield	ground contact ⏚	5	2	4	pressure port	

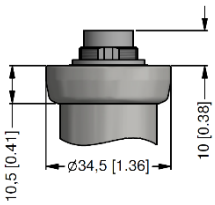
[9] may not be transmitted directly with the PC (the suitable adapter is available as accessory)

Electrical connections	compact field housing	cable colours (IEC 60757)
	 V_{S+} V_{S-} S+ GND	
Supply +	V_S+	WH (white)
Supply –	V_S-	BN (brown)
Signal + (only for 3-wire)	S+	GN (green)
Shield	GND	GNYE (green-yellow)

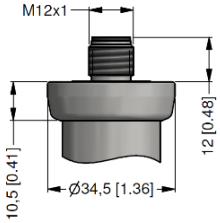
Electrical connections (dimensions mm / in)



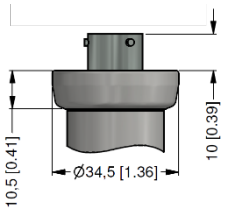
ISO 4400
(IP 65)



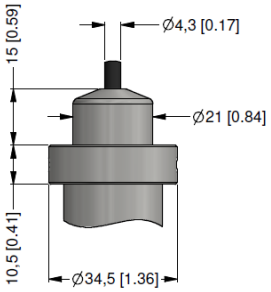
Binder series 723
(IP 67)



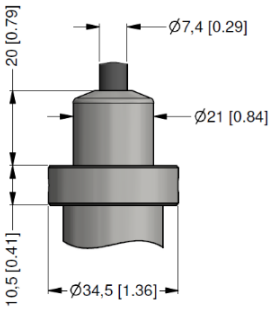
M12x1, 4-pin
(IP 67)



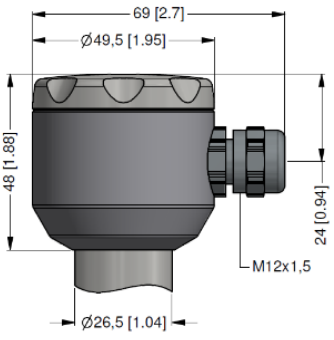
Bayonet MIL-C-26482 (10-6)
(IP 67)



cable outlet with PVC cable
(IP 67) [10]



cable outlet, cable with
ventilation tube (IP 68) [11]



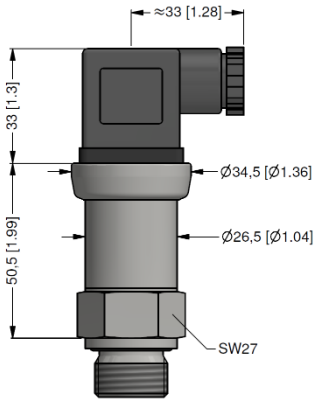
compact field housing
(IP 67)

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

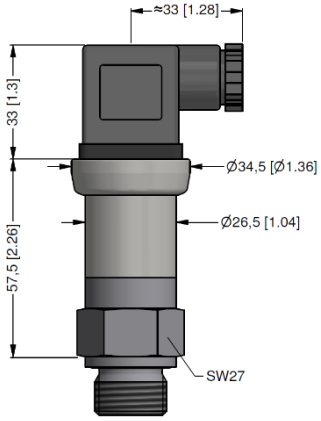
[10] *standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)*
[11] *different cable types and lengths available, permissible temperature depends on kind of cable*

Dimensions (mm / in)

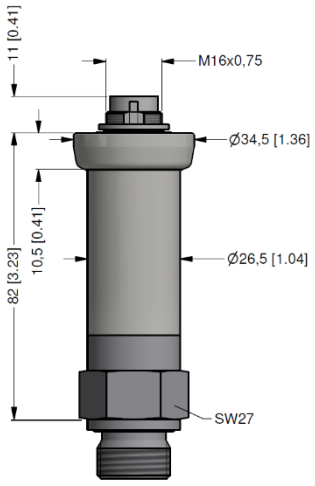
DMP331i [12]



DMP 333i [12, 13]

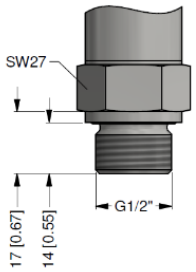


DMP 331i with communication interface RS232

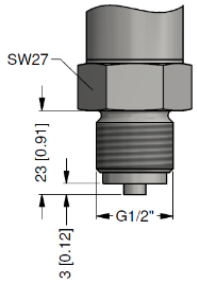


[12] *with electrical connection Bayonet MIL-C-26482 (10-6) increases the length of devices by 5 mm*
[13] *for nominal pressure p_N > 400 bar increases the length without IS-version by 19 mm and with IS-version by 39 mm*

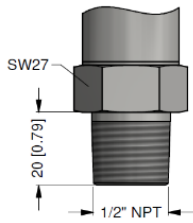
Mechanical connections (dimensions mm / in)



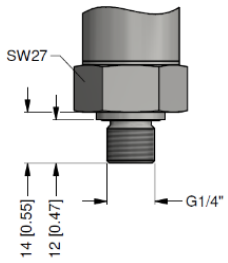
G1/2" DIN 3852



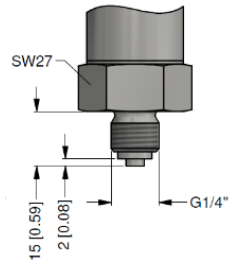
G1/2" EN 837



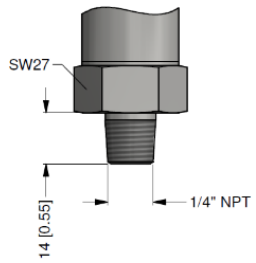
1/2" NPT



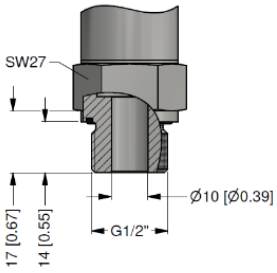
G1/4" DIN 3852



G1/4" EN 837



1/4" NPT



G1/2" open port DIN 3852
(p_N ≤ 40 bar)

⇨ **metric threads and others on request**

Windows® is a registered trade mark of Microsoft Corporation

Tel.: +49 (0) 92 35 / 98 11- 0
Fax: +49 (0) 92 35 / 98 11- 11
www.bdsensors.de
info@bdsensors.de
BD|SENSORS pressure measurement

BD|SENSORS
pressure measurement

Ordering code DMP 331i / DMP 333i

DMP 331i / DMP 333i

□□□-□□□□-□-□-□□□-□□□-□-□□□

Pressure			
For DMP 331i			
	gauge	110	
	absolute	111	
For DMP 333i			
	gauge [1]	130	
	absolute	131	
Input	**[mH_2O]**	**[bar]**	
For DMP 331i [2]			
	4	0.40	4000
	10	1.0	1001
	20	2.0	2001
	40	4.0	4001
	100	10	1002
	200	20	2002
	400	40	4002
	600	60	6002
For DMP 333i [2]			
		100	1003
		200	2003
		400	4003
		600	6003
For DMP 331i			
		-0.40 … 0.40	S400
		-1 … 1	S102
		-1 … 2	V202
		-1 … 4	V402
		-1 … 10	V103
		customer	9999 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	100
		male plug Binder series 723 (5-pin)	200
		male plug Binder series 723 (7-pin) and female plug Binder series 423 (7-pin)	A00
		male plug M12x1 (4-pin) / metal - for analog output	M10
		male plug M12x1 (4-pin) / metal - for digital output	M13
		Bayonet MIL-C-26482 (10-6); 2 wire	BG0
		Bayonet MIL-C-26482 (10-6); 3 wire	BG4
		cable outlet with PVC cable (IP67) [3]	TA0
		cable outlet, cable with ventilation tube (IP68) [4]	TR0
		compact field housing stainless steel 1.4301 (304)	850
		customer	999 consult
Mechanical connection			
		G1/2" DIN 3852	100
		G1/2" EN 837	200
		G1/4" DIN 3852	300
		G1/4" EN 837	400
		G1/2" DIN 3852 with flush sensor [5]	F00
		G1/2" DIN 3852 open pressure port [5]	H00
		1/2" NPT	N00
		1/4" NPT	N40
		customer	999 consult
Seal			
For DMP 331i			
		FKM	1
		without (welded version) [5, 6]	2
For DMP 333i			
		FKM	1
		NBR	5
		customer	9 consult
Special version			
		standard	111
		communication interface RS232 [7]	121
		customer	999 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); others on request

[4] code TR0 = PVC cable, cable with ventilation tube available in different types and lengths

[5] only possible for DMP 331i and $p_N \leq 40$ bar

[6] welded version only with pressure ports according to EN 837 and NPT

[7] communication interface RS232 only possible with electrical connection Binder serie 723/423 (7 pin)
Software, Interface and cable for DMP 331i and DMP 333i with option RS232 have to be order separately (ordering code: CIS-G; software appropriate for Windows® 95, 98, 2000, NT version 4.0 or newer and XP)
Windows® is a registrated trademark of Microsoft Corporation

31.01.2023

BD|SENSORS GmbH
BD-Sensors-Straße 1
D - 95199 Thierstein

Tel.: +49 (0) 92 35 / 98 11- 0
Fax: +49 (0) 92 35 / 98 11- 11

www.bdsensors.de
info@bdsensors.de