

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)



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 / $V_s = 12 \dots 36 V_{DC}$
Option IS-version	2-wire: 4 ... 20 mA / $V_s = 14 \dots 28 V_{DC}$
Options analogue signal	2-wire: 4 ... 20 mA with communication interface ²
	3-wire: 0 ... 10 V / $V_s = 14 \dots 36 V_{DC}$
	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 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: $R_{max} = [(V_s - V_{s min}) / 0.02 A] \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$
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; welded version not available with pressure ranges > 60 bar

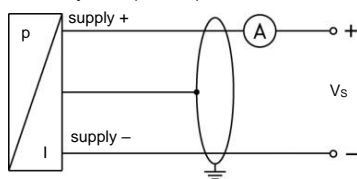
Mechanical stability		
Vibration	10 g RMS (20 ... 2000 Hz)	according to DIN EN 60068-2-6
Shock	100 g / 11 msec.	according to DIN EN 60068-2-27
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approvals	DX19-DMP 331i DX19-DMP 333i	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC 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_{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: signal output voltage:	max. 25 mA 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 $p_N \leq 1\text{ bar}$.

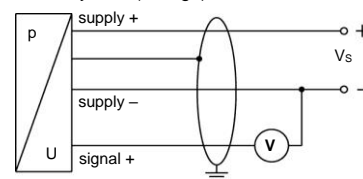
⁸ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



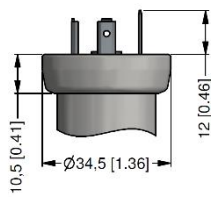
Pin configuration

Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723/423 (7-pin)	M12x1 / metal (4-pin)	Bayonet MIL-C-26482 (10-6)	
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	

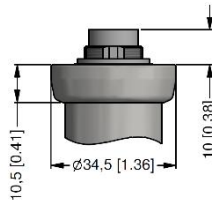
⁹ may not be transmitted directly with the PC (the suitable adapter is available as accessory)

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

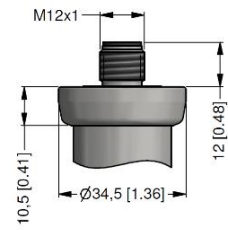
Electrical connections (dimensions mm / in)



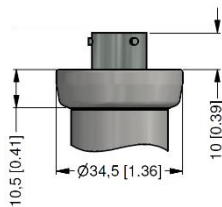
ISO 4400
(IP 65)



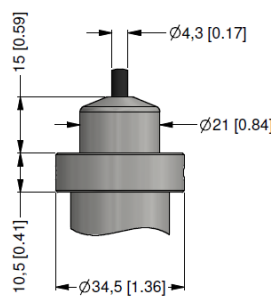
Binder series 723
(IP 67)



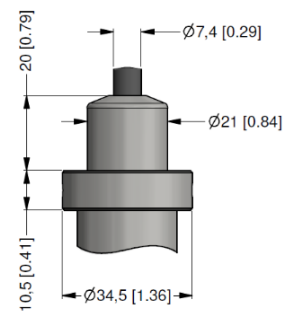
M12x1, 4-pin
(IP 67)



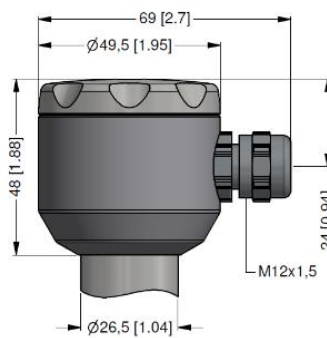
Bayonet MIL-C-26482 (10-6)
(IP 67)



cable outlet with PVC cable
(IP 67)¹⁰



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

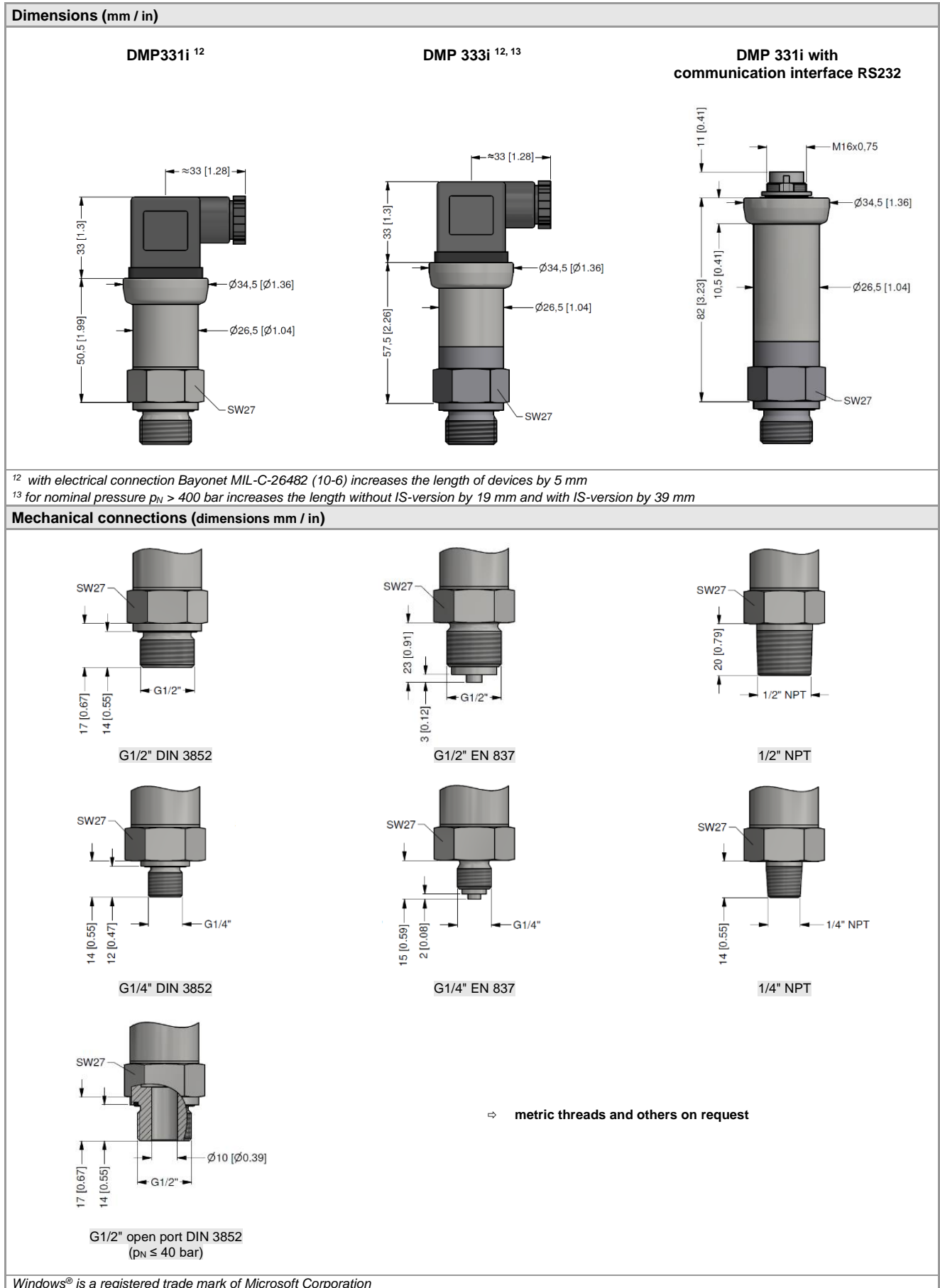


compact field housing
(IP 67)

⇒ 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



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Ordering code DMP 331i / DMP 333i

DMP 331i / DMP 333i

Pressure				
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 331i ²				
4	0.40	4	0	0
10	1.0	1	0	0
20	2.0	2	0	0
40	4.0	4	0	0
100	10	1	0	0
200	20	2	0	0
400	40	4	0	0
600	60	6	0	0
For DMP 333i ²				
	100	1	0	0
	200	2	0	0
	400	4	0	0
	600	6	0	0
For DMP 331i				
	-0.40 ... 0.40	S	4	0
	-1 ... 1	S	1	0
	-1 ... 2	V	2	0
	-1 ... 4	V	4	0
	-1 ... 10	V	1	0
	customer	9	9	9
Output				
	4 ... 20 mA / 2-wire		1	
	intrinsic safety 4 ... 20 mA / 2-wire		E	
	0 ... 10 V / 3-wire		3	
	customer		9	
Accuracy (at nominal pressure)				
	0.1 % FSO		1	
	customer		9	
Electrical connection				
	male and female plug ISO 4400		1	0
	male plug Binder series 723 (5-pin)		2	0
	male plug Binder series 723 (7-pin)		A	0
	and female plug Binder series 423 (7-pin)			
	male plug M12x1 (4-pin) / metal - for analog output		M	1
	male plug M12x1 (4-pin) / metal - for digital output		M	1
	Bayonet MIL-C-26482 (10-6); 2 wire		B	G
	Bayonet MIL-C-26482 (10-6); 3 wire		B	G
	cable outlet with PVC cable (IP67) ³		T	A
	cable outlet, cable with ventilation tube (IP68) ⁴		T	R
	compact field housing stainless steel 1.4301 (304)		8	5
	customer		9	9
Mechanical connection				
	G1/2" DIN 3852		1	0
	G1/2" EN 837		2	0
	G1/4" DIN 3852		3	0
	G1/4" EN 837		4	0
	G1/2" DIN 3852 with flush sensor ⁵		F	0
	G1/2" DIN 3852 open pressure port ⁵		H	0
	1/2" NPT		N	0
	1/4" NPT		N	4
	customer		9	9
Seals				
For DMP 331i				
	FKM		1	
	without (welded version) ^{5,6}		2	
For DMP 333i				
	FKM		1	
	NBR		5	
	customer		9	
Special version				
	standard		1	1
	communication interface RS232 ⁷		1	2
	customer		9	9

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 ≤ 40 bar

⁶ welded version only with pressure ports according to EN 837

⁷ Communication interface RS232 only possible with el. connection Binder serie 723/423 (7pin)
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)
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