

SensaCo Ltd.



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

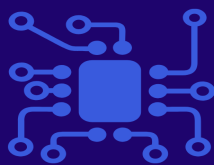


Laboratory techniques

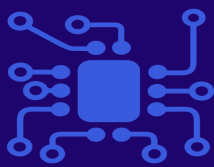


Energy production (gas consumption
and thermal energy measurement)

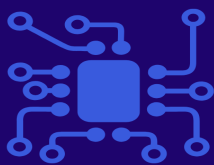




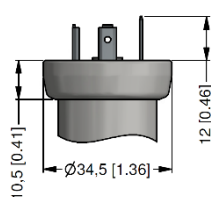
Pressure ranges DMP 331i ¹										
Nominal pressure gauge / absolute	[bar]	0.4	1	2	4	10	20	40	60	
Overpressure	[bar]	2	5	10	20	40	80	105	105	
Burst pressure	[bar]	3	7.5	15	25	50	120	210	210	
Vacuum ranges										
Nominal pressure gauge	[bar]	-0.4 ... 0.4		-1 ... 1		-1 ... 2		-1 ... 4		-1 ... 10
Overpressure	[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 ... 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	no change of accuracy ⁴									
- 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 _{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										



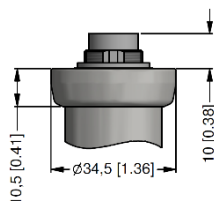
Mechanical stability						
Vibration	10 g RMS (20 ... 2000 Hz)	according to DIN EN 60068-2-6				
Shock	100 g / 11 msec.	according to DIN EN 60068-2-27				
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approvals	DX19-DMP 331i DX19-DMP 333i	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: 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: 1 µH/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 ≤ 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)		



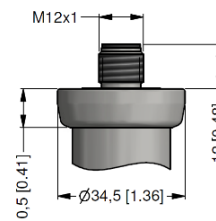
Electrical connections (dimensions mm / in)



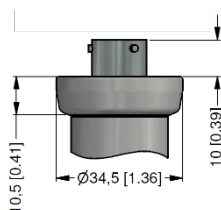
ISO 4400
(IP 65)



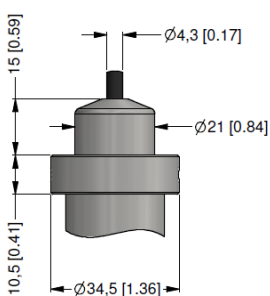
Binder series 723
(IP 67)



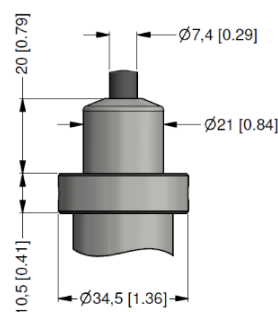
M12x1, 4-pin
(IP 67)



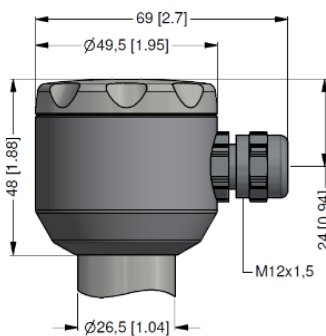
Bayonet MIL-C-26482 (10-6)
(IP 67)



cable outlet with PVC cable
(IP 67) ¹⁰



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

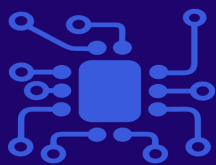


compact field housing
(IP 67)

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

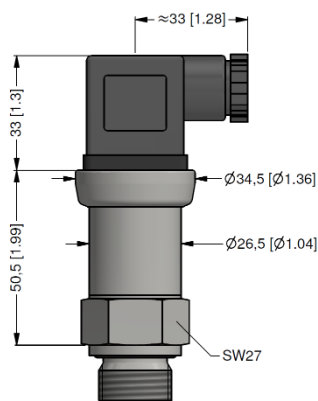
¹⁰ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)

¹¹ different cable types and lengths available, permissible temperature depends on kind of cable

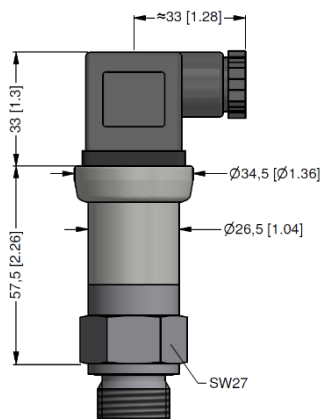


Dimensions (mm / in)

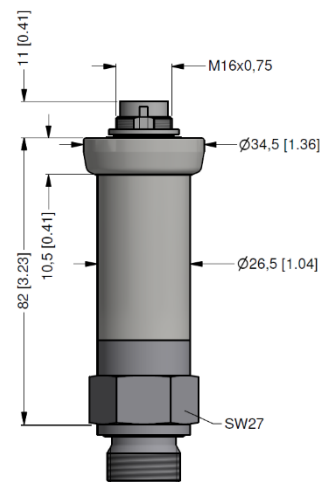
DMP331i¹²



DMP 333i^{12, 13}



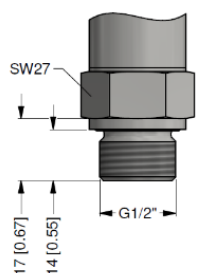
DMP 331i with communication interface RS232



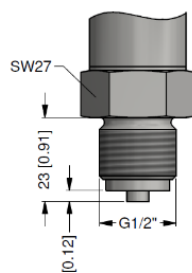
¹² with electrical connection Bayonet MIL-C-26482 (10-6) increases the length of devices by 5 mm

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

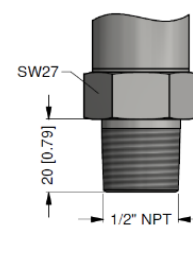
Mechanical connections (dimensions mm / in)



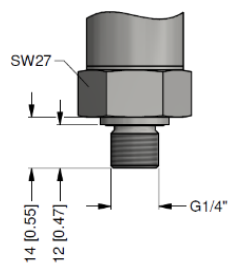
G1/2" DIN 3852



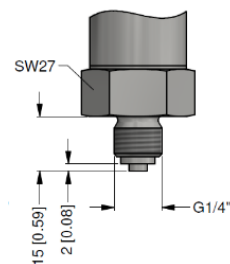
G1/2" EN 837



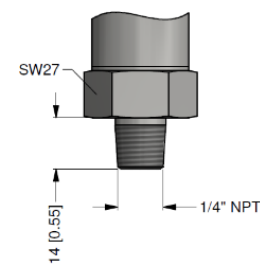
1/2" NPT



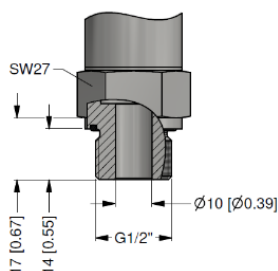
G1/4" DIN 3852



G1/4" EN 837



1/4" NPT



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

↔ metric threads and others on request

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DMP 331i / DMP 333i Precision Pressure Transmitter

Ordering code DMP 331i / DMP 333i

DMP 331i / DMP 333i

			-				-		-		-			-			-		
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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	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 333i ²									
	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				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 plug Binder series 723 (7-pin)				A	0	0		
	and female plug Binder series 423 (7-pin)								
	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) ³				T	A	0		
	cable outlet, cable with ventilation tube (IP68) ⁴				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 ⁵				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
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					1	1	1	
	communication interface RS232 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); 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)

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