



Pressure Transmitter DP 331

Piezoresistive stainless steel sensor

Industrial sensor for low pressure



- Nominal pressure: 0 ... 100 mbar up to 0 ... 60 bar
- Accuracy: 0.1 / 0.25 / 0.35 %
- Flush pressure port G 1/2" from 100 mbar
- Excellent thermal behavior
- Excellent accuracy

D-EN-DP331_20200325



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The pressure transmitter DP 331 can be used in all industrial areas when the medium is compatible with stainless steel 1.4404 (316 L) or 1.4435 (316 L). Additional are different elastomer seals as well as a helium tested welded version available.

The modular concept of the device allows to combine different stainless steel sensors and electronic modules with a variety of electrical and mechanical versions. Thus a diversity of variations is created, meeting almost all requirements in industrial applications.

Operating principle

The DP 331 is a pressure transmitter for universal applications in all industrial areas. Suitable measuring media are compressed air, non-aggressive gases, steam, water, heating and diesel oil, as well as all media compatible with stainless steel 1.4571 or 1.4435.

A piezoresistive stainless steel sensor with a low temperature error and very good long-term stability forms the basis of the DP 331, which makes it possible to meet accuracy requirements of up to 0.1% FSO according to IEC 60770.

A wide range of standardized output signals as well as mechanical and electrical connection variants cover almost all practical applications. It is also possible to use the DP 331 in potentially explosive areas from zone 0/20.

Features

- Nominal pressure: 0 ... 100 mbar up to 0 ... 60 bar
- Accuracy: 0.1 / 0.25 / 0.35 %
- Flush pressure port G 1/2" from 100 mbar
- Excellent thermal behavior
- Excellent accuracy

Optional features

- IS-version
- Ex ia = intrinsically safe for gases and dusts
- SIL 2
- According to IEC 61508 / IEC 61511
- Pressure sensor welded
- Customer specific versions

Media

- Fuels and oils
- Water
- Gases

Preferred areas of use

- Mechanical and plant engineering
- Energy industry
- HVAC
- Environmental industry

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Input pressure range									
Nominal pressure gauge	[bar]	-1...0	0.10	0.16	0.25	0.40	0.60	1	1.6
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6
Overpressure	[bar]	5	0.5	1	1	2	5	5	10
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15

Nominal pressure gauge / abs.	[bar]	2.5	4	6	10	16	25	40	60
Overpressure	[bar]	10	20	40	40	80	80	105	105
Burst pressure $\geq$	[bar]	15	25	50	50	120	120	210	210
Vacuum resistance		$P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request							

Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / $V_s = 8 \dots 32 V_{DC}$	SIL-version: $V_s = 14 \dots 28 V_{DC}$
Option IS-protection	2-wire: 4 ... 20 mA / $V_s = 10 \dots 28 V_{DC}$	SIL-version: $V_s = 14 \dots 28 V_{DC}$
Options 3-wire	3-wire: 0 ... 20 mA / $V_s = 14 \dots 30 V_{DC}$ 0 ... 10 V / $V_s = 14 \dots 30 V_{DC}$	

Performance		
Accuracy ¹	standard: nominal pressure < 0.4 bar: $\leq \pm 0.50$ % FSO nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO option 1: nominal pressure ≥ 0.4 bar: $\leq \pm 0.25$ % FSO option 2: for all nominal pressure: $\leq \pm 0.10$ % FSO	
Permissible load	current 2-wire: $R_{\max} = [(V_s - V_{s \min}) / 0.02 \text{ A}] \Omega$ current 3-wire: $R_{\max} = 240 \Omega$ voltage 3-wire: $R_{\min} = 10 \text{ k}\Omega$	
Influence effects	supply: 0.05 % FSO / 10 V	load: 0.05 % FSO / k Ω
Long term stability	$\leq \pm 0.1$ % FSO / year at reference conditions	
Response time	2-wire: ≤ 10 msec	3-wire: ≤ 3 msec

¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Accuracy according to IEC 60770 – 1 mm point adjustment (non-linearity, hysteresis, repeatability)			
Thermal effects (Offset and Span)			
Nominal pressure P_N	[bar]	-1 ... 0	< 0.40
Tolerance band	[% FSO]	± 0.75	± 1
in compensated range	[°C]	-20 ... 85	-20 ... 85

Permissible temperatures	
Permissible temperatures	medium: -40 ... 125 °C electronics / environment: -40 ... 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

Mechanical stability	
Vibration	10 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6
Shock	500 g / 1 msec according to DIN EN 60068-2-27

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	standard: FKM options: EPDM welded version ² (for $P_N \leq 40$ bar) others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm

² welded version only with pressure ports according to EN 837, $P_N \leq 40$ bar



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Explosion protection (only for 4...20 mA / 2-wire)	
Approvals DX19-DP 331	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 T 85°C Da
Safety technical maximum 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: -20 ... 70 °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	
Option SIL2 version ³	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 200 g
Installation position	any ⁴
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

³ only for 4 ... 20 mA / 2-wire, not in combination with accuracy 0.1 %

⁴ 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 $P_N \leq 1 \text{ bar}$.

Wiring diagrams	
2-wire-system (current)	3-wire-system (current / voltage)

Pin configuration						
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1/ metal (4-pin)	Bayonet MIL-C-26482 (10-6)		cable colours (IEC 60757)
				2-wire	3-wire	
Supply +	1	3	1	A	A	IN +
Supply -	2	4	2	B	D	IN -
Signal + (for 3-wire)	3	1	3	-	B	OUT +
Shield	ground pin	5	4	pressure port		GN YE (green-yellow)

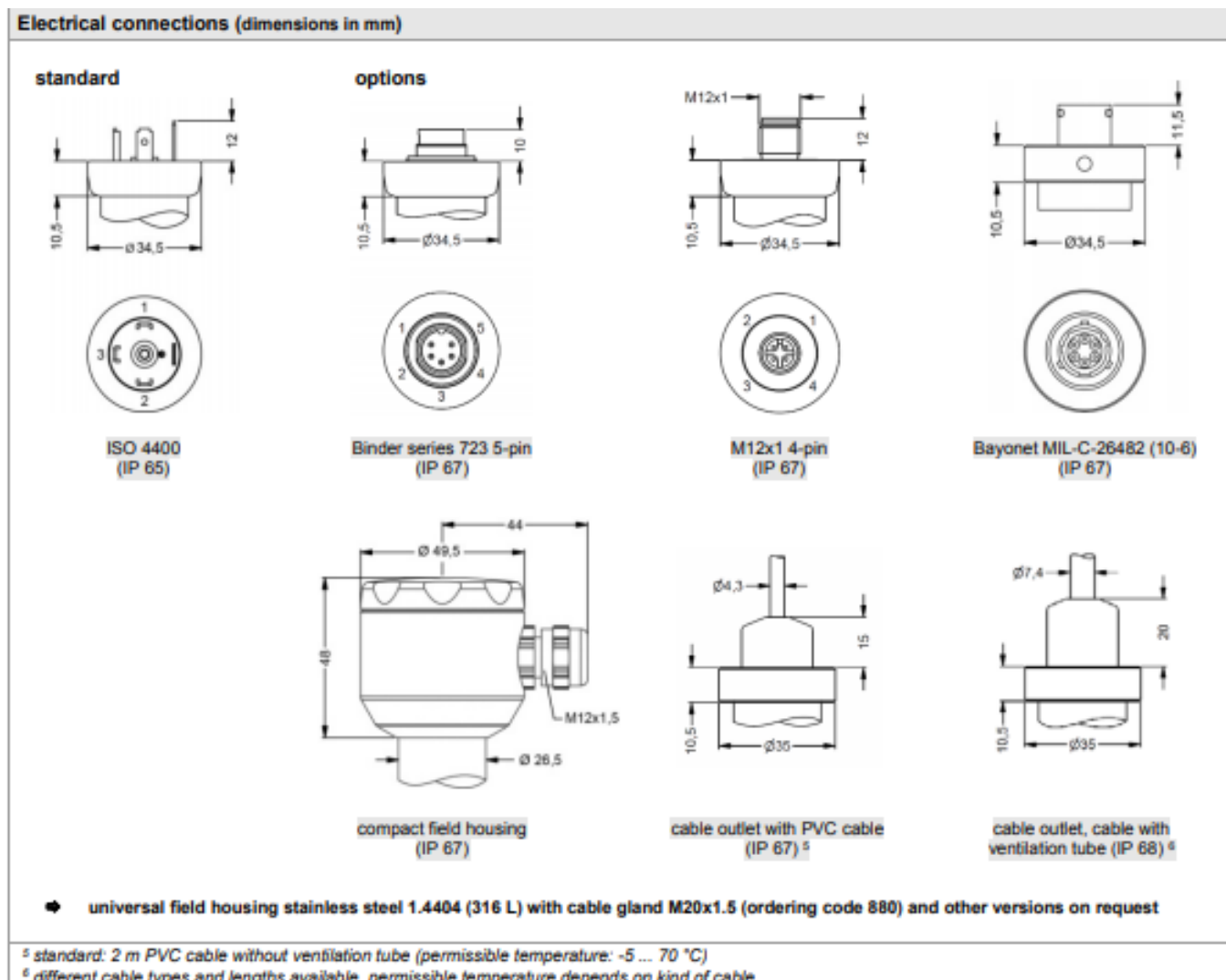
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Important instructions!

Technical changes and errors reserved.

Pictures can be similar.

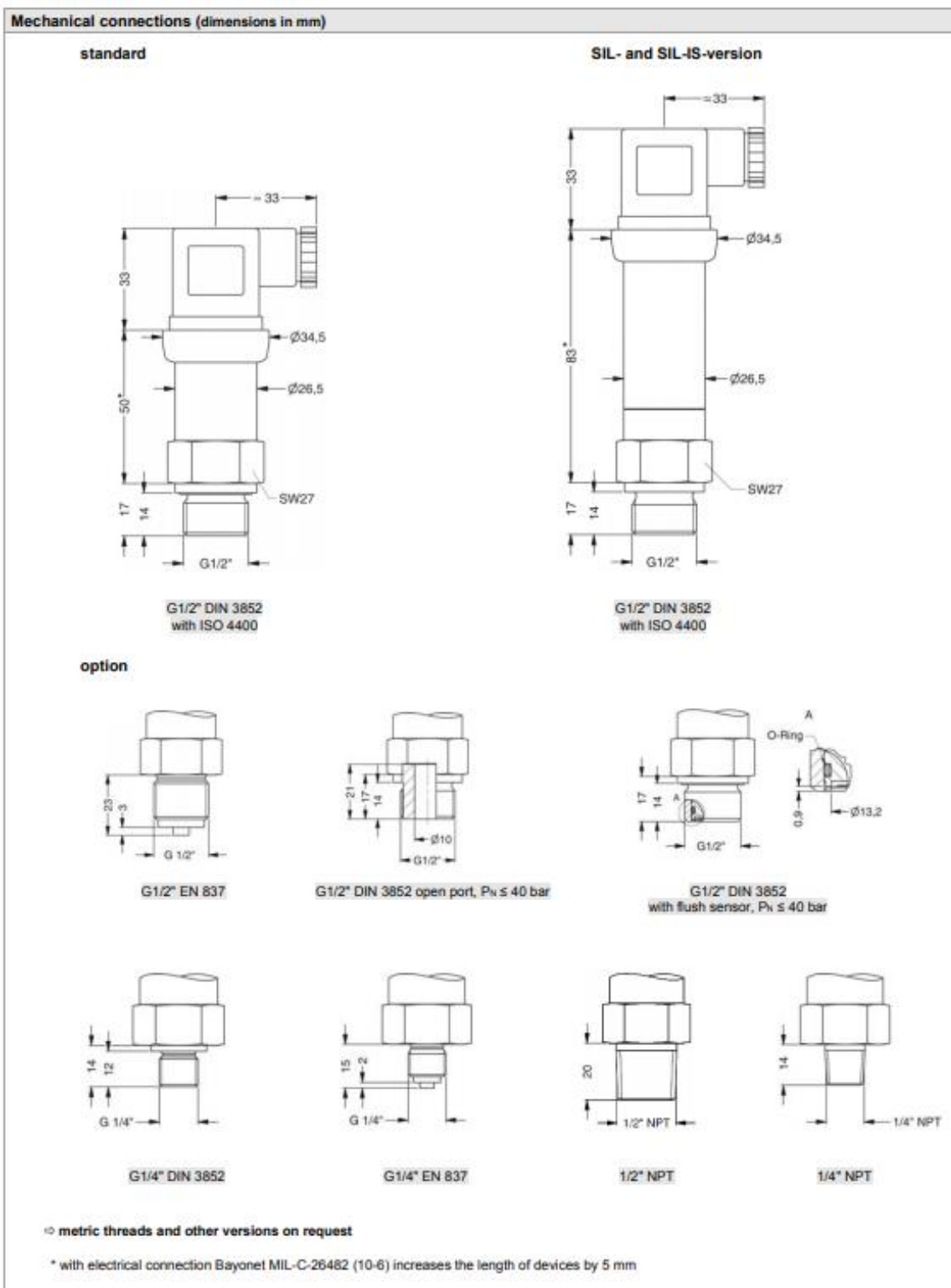
The operating instructions belonging to this device must be observed! Download at www.schmidt-messtechnik.com.



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