DMP 331P

Industrial Pressure Transmitter

Pressure Ports And Process Connections With Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Output signals

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

Special characteristics

- hygienic process connections, EHEDG-conformity
- reduced oil volume, minimises temperature influence at zero point
- CIP / SIP cleaning up to 150 °C
- vacuum resistant

Optional versions

- IS-version
  Ex ia = intrinsically safe for gases and dusts
- SIL 2
  according to IEC 61508 / IEC 61511
- special materials
  as Hastelloy® and Tantal
- cooling element for media temperatures up to 300 °C

The pressure transmitter DMP 331P was designed for use in the food and pharmaceutical industry. The compact design with hygienic process connections makes it possible to achieve an outstanding performance in terms of accuracy, temperature behavior and long term stability.

The modular construction concept allows a combination of various process connections with different filling fluids and a cooling element. Several electrical connections complete the profile of DMP 331P. This transmitter fulfills nearly all requirements in hygienic industrial processes.

Preferred areas of use are

Food Industry

Pharmacy

Material and test certificates

- material mill test report
  according to DIN EN 10204-3.1.
- specific test report
  according to DIN EN 10204-2.2.

Input pressure range [1]								
Nominal pressure gauge / abs. [bar]	-1…0	0.10	0.16	0.25	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
Overpressure [bar]	10	20	40	40	80	80	105
Burst pressure ≥ [bar]	15	25	50	50	120	120	210
Vacuum resistance	P_N ≥ 1 bar: unlimited vacuum resistance P_N ≤ 1 bar: on request						

[1] consider the pressure resistance of fitting and clamps

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

Performance	
Accuracy [2]	standard: nominal pressure < 0.4 bar : ≤ ± 0.5 % FSO nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO option: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO
Permissible load	current 2-wire: R_{max} = [(V_S – $V_{S\ min}$) / 0.02 A] Ω current 3-wire: R_{max} = 500 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 % FSO / year at reference conditions
Response time	2-wire: < 10 msec 3-wire: ≤ 3 msec

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

Thermal effects (Offset and Span) [3] **/ Permissible temperatures**			
Nominal pressure P_N [bar]	-1 … 0	< 0.40	≥ 0.40
Tolerance band [% FSO]	≤ ± 0.75	≤ ± 1,5	≤ ± 0.75
in compensated range [°C]	-20 ... 85	0 ... 50	-20 ... 85
Permissible temperatures [4]	medium: -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food compatible oil electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C		
Permissible temperature medium for cooling element 300°C	filling fluid silicon oil	overpressure: -40 … 300 °C	vacuum: -40 ... 150 °C[5]
	filling fluid food compatible oil	overpressure: -10 ... 250 °C	vacuum: -10 ... 150 °C[5]

[3] an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.
[4] max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C
[5] also for P_{abs} ≤ 1 bar

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 according to DIN EN 60068-2-6	G 1/2": 20 g RMS (25 ... 2000 Hz) others except G 1/2": 10 g RMS (25 … 2000 Hz)
Shock according to DIN EN 60068-2-27	G 1/2": 500 g / 1 msec others except G 1/2“: 100 g / 1 msec

Filling fluids	
Standard	silicon oil
Options	food compatible oil with FDA approval (Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662) others on request

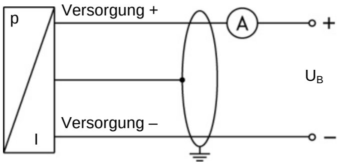
Materials	
Pressure port	stainless steel 1.4404 (316 L) others on request
Housing	stainless steel 1.4404 (316 L)
Option compact field housing	stainless steel 1.4305 (303), cable gland brass, nickel plated others on request
Seals (media wetted)	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures > 200 °C) others on request clamp and dairy pipe: without
Diaphragm	stainless steel 1.4435 (316 L) / Tantalum and Hastelloy® C-276 (2.4819) on request
Media wetted parts	pressure port, seals, diaphragm

Explosion protection (only for 4 … 20 mA / 2-wire)	
Approvals DX 19-DMP 331P	**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 V, I_i = 93 mA, P_i = 660 mW, $C_i \approx 0$ nF, $L_i \approx 0$ µH, the supply connections have an inner capacity of max. 27 nF to the housing
Max. 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: 1µH/m

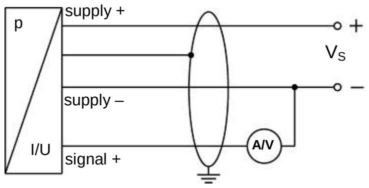
Miscellaneous	
Option SIL 2	according to IEC 61508 / IEC 61511
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	min. 200 g (depending on process connection)
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position for $P_N \leq 2$ bar have to be specified in the order)
Operational life	> 100 x 10^6 pressure cycles
CE-conformity	EMC Directive: 2004/108/EC
ATEX Directive	94/4/EG

Wiring diagrams

2-Leiter-System (Strom)



3-wire-system (current / voltage)

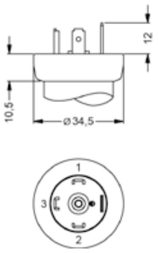


Pin configuration

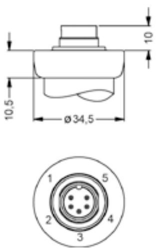
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colours (DIN 47100)
Supply + Supply – Signal (only 3-wire)	1 2 3	3 4 1	1 2 3	IN + IN - OUT+	wh (white) bn (brown) gn (green)
Shield	ground pin	5	4	⏚	gn/ye (green / yellow)

Electrical connections (dimensions in mm)

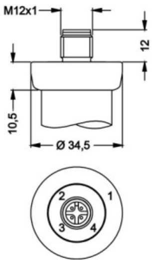
standard **option**



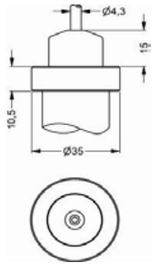
ISO 4400
(IP 65)



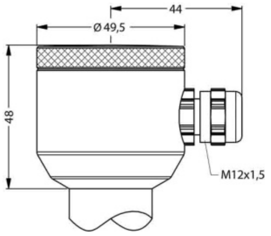
Binder Series 723
(IP 67)



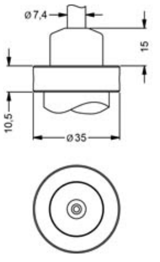
M12x1 4-pin
(IP 67)



cable outlet with PVC cable
(IP 67) [6]



compact field housing
(IP 67)



cable outlet, cable with ventilation tube
(IP 68) [7]

⇨ **universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request**

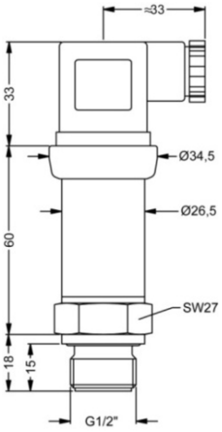
---

[6] *standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 … 70°C)*

[7] *different cable types and lengths available, permissible temperature depends on kind of cable*

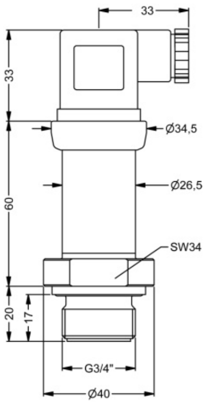
Mechanical connection (dimension in mm)

Standard

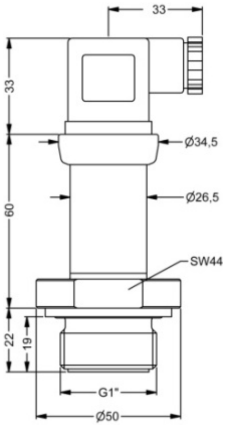


G1/2" flush DIN 3852[8]

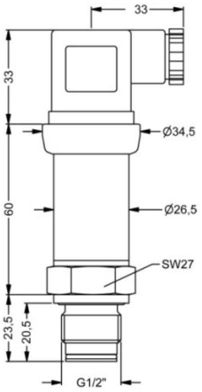
Option



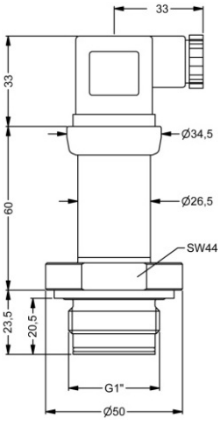
G 3/4" flush DIN 3852
with ISO 4400



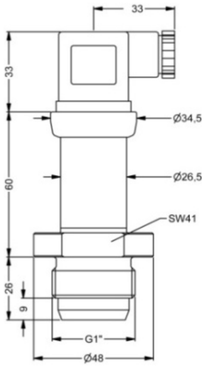
G1" flush DIN 3852
with ISO 4400



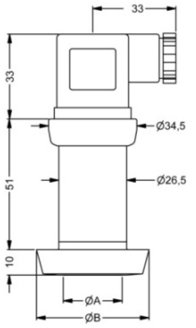
G1/2" flush
with radial o-ring [8]



G1" flush
with radial o-ring

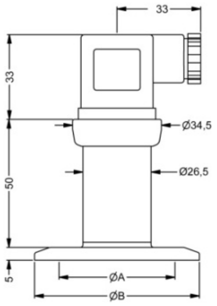


G1" cone
with ISO 4400



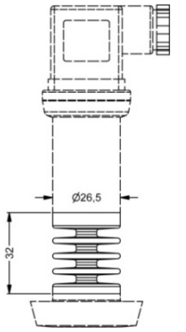
dairy pipe (DIN 11851)
with ISO 4400

dimension in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68.5
PN	≤ 40	≤ 40	≤ 25



clamp (ISO 2852)
with ISO 4400

dimension in mm			
size	DN 25	DN 38	DN 51
A	23	32	45
B	50.5	50.5	64
PN	≤ 16	≤ 16	≤ 16



cooling element 300 °C

- ⇨ **SIL- and SIL-Ex version: total length increases by 26.5 mm!**
- ⇨ **metric threads and other versions on request**

---

[8] *possible only for $P_N \geq 1$ bar*

Ordering code DMP 331P

DMP 331P ☐☐☐-☐☐☐☐-☐-☐-☐☐☐-☐☐☐-☐-☐-☐-☐☐☐

Pressure			
	gauge	500	
	absolute	501	
Input	**[bar]**		
	0.10	1000	
	0.16	1600	
	0.25	2500	
	0.40	4000	
	0.60	6000	
	1.0	1001	
	1.6	1601	
	2.5	2501	
	4.0	4001	
	6.0	6001	
	10	1002	
	16	1602	
	25	2502	
	40	4002	
	-1 … 0	X102	
	customer	9999	consult
Output			
	4 … 20 mA / 2-wire	1	
	0 … 20 mA / 3-wire	2	
	0 … 10 V / 3-wire	3	
	Intrinsic safety 4 … 20 mA / 2-wire	E	
	SIL2 4 … 20 mA / 2-wire	1S	
	SIL2 with Intrinsic safety 4 … 20 mA / 2-wire	ES	
	customer	9	consult
Accuracy			
standard for $P_N \geq 0{,}4$ bar	0.35 %	3	
standard for $P_N < 0{,}4$ bar	0.5 %	5	
option for $P_N \geq 0{,}4$ bar	0.25 %	2	
	customer	9	consult
Electrical connection			
	Male and female plug ISO 4400	100	
	Male plug Binder series 723 (5-pin)	200	
	Cable outlet with PVC-cable [1]	TA0	
	Cable outlet [2]	TR0	
	Male plug M12x1 (4-pin) / metal	M10	
	Compact field housing stainless steel stainless steel 1.4305 [3]	850	
	customer	999	consult
Mechanical connection			
	G1/2" with flush welded diaphragm (DIN 3852) [4]	Z00	
	G3/4" with flush welded diaphragm (DIN 3852)	Z30	
	G1" with flush welded diaphragm (DIN 3852)	Z31	
	G1" DIN 3852 with rad. o-ring and flush diaphragm	Z57	
	G1/2" DIN 3852 with rad. o-ring and flush diaphragm [4]	Z61	
	G 1" cone	K31	
	Clamp DN 25 (ISO 2852)	C61	
	Clamp DN 38 (ISO 2852)	C62	
	Clamp DN 51 (ISO 2852)	C63	
	Dairy pipe DN 25 (DIN 11851) [3]	M73	
	Dairy pipe DN 40 (DIN 11851) [3]	M75	
	Dairy pipe DN 50 (DIN 11851) [3]	M76	
	customer	999	consult
Diaphragm			
	Stainless steel 1.4435 (316L)	1	
	Tantal	T	
	Hastelloy ® C-276 (2.4819)	H	
	customer	9	consult
Seals			
for clamp or dairy pipe:	without	0	
for inch thread - standard:	FKM	1	
for inch thread - option:	FFKM	7	
	customer	9	consult
Filling Fluids			
	Silicon oil	1	
	food compatible oil	2	
	customer	9	consult
Special version			
	standard	000	
	with cooling element up to 300°C	200	
	customer	999	consult

[1] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 … 70°C), others on request

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

[3] 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.

[4] possible only for $P_N \geq 1$ bar

07.01.2013

This price list contains product specification; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.