

DMP 331

Industrial Pressure Transmitter for Low Pressure

Stainless Steel Sensor

accuracy according to IEC 60770:
 standard: 0.35 % FSO
 option: 0.25 / 0.1 % FSO



Nominal pressure

from 0 ... 100 mbar up to 0 ... 60 bar

Output signals

2-wire: 4 ... 20 mA

3-wire: 0 ... 20 mA / 0 ... 10 V

others on request

Special characteristic

- ▶ perfect thermal behaviour
- ▶ excellent long term stability
- ▶ pressure port
G 1/2" flush from 100 mbar




Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL 2-according to IEC 61508 / IEC 61511
- ▶ pressure sensor welded
- ▶ customer specific versions

The pressure transmitter DMP 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 modulare 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.

Preferred areas of use are

-  Plant and Machine Engineering
-  Environmental Engineering
(water - sewage - recycling)
-  Energy Industry



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DMP 331

Industrial Pressure Transmitter



Technical Data

| 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 \geq | [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 / $V_S = 8 \dots 32 V_{DC}$ | | | | | | | |
| Option IS-protection | | 2-wire: 4 ... 20 mA / $V_S = 10 \dots 28 V_{DC}$ | | | | | | | |
| 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: $\leq \pm 0.5$ % 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: $\leq \pm 0.1$ % FSO | | | | | | | |
| Permissible load | | current 2-wire: $R_{max} = [(V_S - V_S \text{ min}) / 0.02 \text{ A}] \Omega$ current 3-wire: $R_{max} = 500 \Omega$ 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) | | | | | | | | | |
| Thermal effects (Offset and Span) | | | | | | | | | |
| Nominal pressure P_N | [bar] | -1 ... 0 | | | < 0.40 | | | ≥ 0.40 | |
| Tolerance band | [% FSO] | $\leq \pm 0.75$ | | | $\leq \pm 1$ | | | $\leq \pm 0.75$ | |
| in compensated range | [°C] | -20 ... 85 | | | 0 ... 70 | | | -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 1.4305 (303), cable gland brass, nickel plated | | | | | | others on request | |
| Seals (media wetted) | | standard: FKM options: EPDM welded version ² 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 | | | | | | | | | |
| Explosion protection (only for 4 ... 20 mA / 2-wire) | | | | | | | | | |
| Approvals | | IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X | | | | | | | |
| DX19-DMP 331 | | zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da | | | | | | | |
| Safety technical maximum values | | $U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C_i \approx 0 \text{ nF}$, $L_i \approx 0 \mu\text{H}$, 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 $\mu\text{H}/\text{m}$ | | | | | | | |

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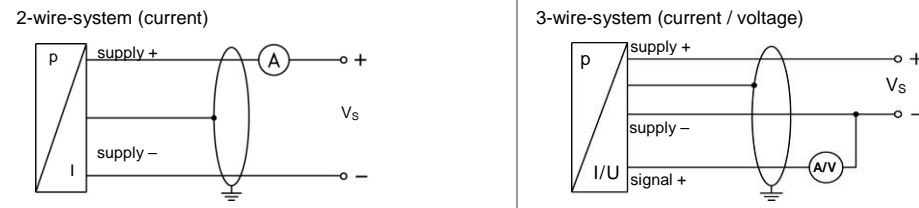
Technical Data

| Miscellaneous | |
|---------------------------|---|
| Option SIL ³ 2 | 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 x 10 ⁶ pressure cycles |
| CE-conformity | EMC Directive: 2004/108/EC |
| ATEX Directive | 94/9/EG |

³ only for 4 ... 20 mA / 2-wire, not in combination with the 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 $P_N \leq 1$ bar.

Wiring diagrams

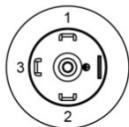
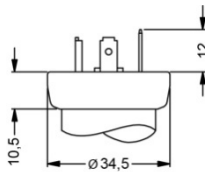


Pin configuration

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

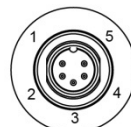
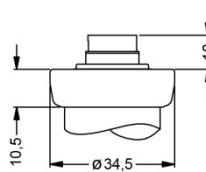
Electrical connections (dimensions in mm)

standard

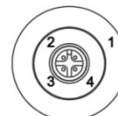
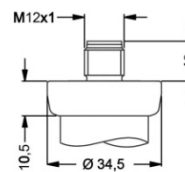


ISO 4400 (IP 65)

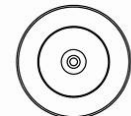
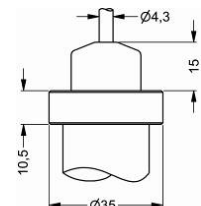
option



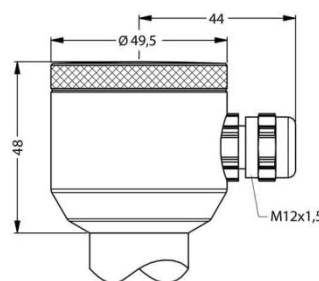
Binder Series 723 5-pin (IP 67)



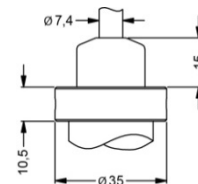
M12x1 4-pin (IP 67)



cable outlet with PVC cable (IP 67)⁵



compact field housing (IP 67)



cable outlet, cable with ventilation tube (IP 68)⁶

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

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

⁶ different cable types and lengths available, permissible temperature depends on kind of cable

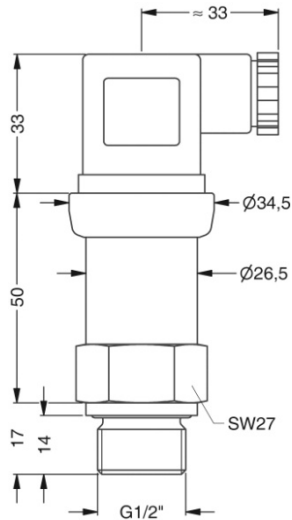
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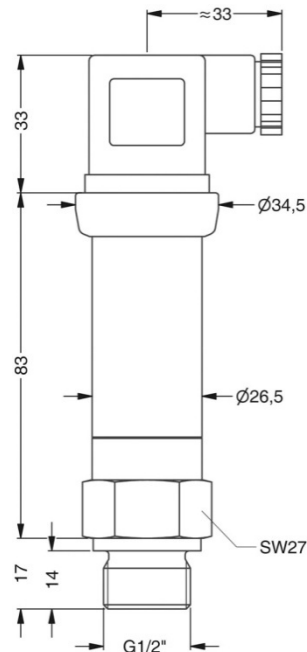
Mechanical connections (dimensions in mm)

standard



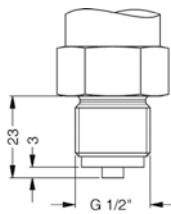
G1/2" DIN 3852
with ISO 4400

SIL- and SIL-IS-version

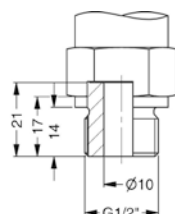


G1/2" DIN 3852
with ISO 4400

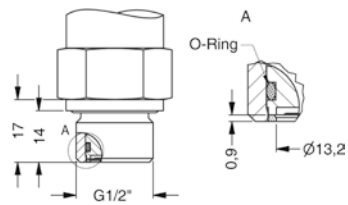
option



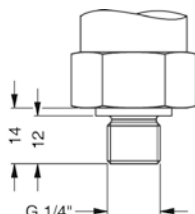
G1/2" EN 837



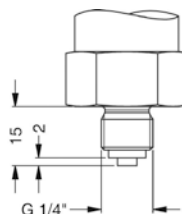
G1/2" open port



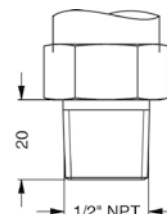
G1/2" DIN 3852
with flush sensor



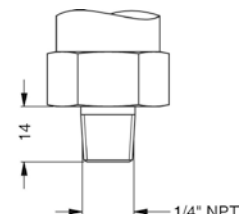
G1/4" DIN 3852



G1/4" EN 837



1/2" NPT



1/4" NPT

⇒ metric threads and other versions on request

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Order Form



Ordering code DMP 331

DMP 331

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| | | | | | | | | | | |
|------------------------------|---|--------------------|---|---|---|----|---|---|---|---------|
| Pressure | | | | | | | | | | |
| | gauge | 1 | 1 | 0 | | | | | | |
| | absolute ¹ | 1 | 1 | 1 | | | | | | |
| Input | | | | | | | | | | |
| | [bar] | | | | | | | | | |
| | 0.10 | 1 | 1 | 0 | 0 | 0 | | | | |
| | 0.16 | 1 | 1 | 6 | 0 | 0 | | | | |
| | 0.25 | 1 | 2 | 5 | 0 | 0 | | | | |
| | 0.40 | | 4 | 0 | 0 | 0 | | | | |
| | 0.60 | | 6 | 0 | 0 | 0 | | | | |
| | 1.0 | | 1 | 0 | 0 | 1 | | | | |
| | 1.6 | | 1 | 6 | 0 | 1 | | | | |
| | 2.5 | | 2 | 5 | 0 | 1 | | | | |
| | 4.0 | | 4 | 0 | 0 | 1 | | | | |
| | 6.0 | | 6 | 0 | 0 | 1 | | | | |
| | 10 | | 1 | 0 | 0 | 2 | | | | |
| | 16 | | 1 | 6 | 0 | 2 | | | | |
| | 25 | | 2 | 5 | 0 | 2 | | | | |
| | 40 | | 4 | 0 | 0 | 2 | | | | |
| | 60 | | 6 | 0 | 0 | 2 | | | | |
| | -1 ... 0 | | X | 1 | 0 | 2 | | | | |
| | customer | | 9 | 9 | 9 | 9 | | | | 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 ≥ 0.4 bar | 0.35 % | | | | 3 | | | | |
| | standard for P _N < 0.4 bar | 0.5 % | | | | 5 | | | | |
| | option 1 for P _N ≥ 0.4 bar | 0.25 % | | | | 2 | | | | |
| | option 2 | 0.1 % ² | | | | 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 | | |
| | Cable outlet with PVC cable ³ | | | | | T | A | 0 | | |
| | Cable outlet ⁴ | | | | | T | R | 0 | | |
| | Male plug M12x1 (4-pin) / metal | | | | | M | 1 | 0 | | |
| | Compact field housing | | | | | 8 | 5 | 0 | | |
| | stainless steel 1.4305 | | | | | 9 | 9 | 9 | | |
| | customer | | | | | | | | | 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 | | | | | F | 0 | 0 | | |
| | G1/2" DIN 3852 open pressure port | | | | | H | 0 | 0 | | |
| | 1/2" NPT | | | | | N | 0 | 0 | | |
| | 1/4" NPT | | | | | N | 4 | 0 | | |
| | customer | | | | | 9 | 9 | 9 | | consult |
| Seals | | | | | | | | | | |
| | FKM | | | | | | | 1 | | |
| | EPDM | | | | | | | 3 | | |
| | without (welded version) ⁵ | | | | | | | 2 | | |
| | customer | | | | | | | 9 | | consult |
| Special version | | | | | | | | | | |
| | standard | | | | | | | 0 | 0 | 0 |
| | customer | | | | | | | 9 | 9 | 9 |
| | | | | | | | | | | consult |

¹ absolute pressure possible from 0.4 bar
² not in combination with SIL
³ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C), others on request
⁴ cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable
⁵ welded version only with pressure ports according to EN 837

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