

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 | IEC 60770 ³ : $\leq \pm 0.1 \% \text{ FSO}$ - TD $\leq 1:5$ no change of accuracy ⁴ - TD $> 1:5$ for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 4): $\leq \pm [0.1 + 0.015 \times \text{turn-down}] \% \text{ FSO}$ with turn-down = nominal pressure range / adjusted range e.g. with a turn-down of 1:10 following accuracy is calculated: $\leq \pm (0.1 + 0.015 \times 10) \% \text{ FSO}$ i.e. accuracy is $\leq \pm 0.25 \% \text{ FSO}$ |
| Permissible load | current 2-wire: $R_{max} = [(V_s - V_{s \text{ min}}) / 0.02 \text{ A}] \Omega$ voltage 3-wire: $R_{min} = 10 \text{ k}\Omega$ |
| Influence effects | supply: 0.05 % FSO / 10 V load: 0.05 % FSO / $\text{k}\Omega$ |
| Long term stability | $\leq \pm (0.1 \times \text{turn-down}) \% \text{ FSO} / \text{year}$ at reference conditions |
| Response time | approx. 5 msec |
| Adjustability (with option communication interface RS232) | configuration of following parameters possible (interface / software necessary): - 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:

$\leq \pm (0.1 + 0.02 \times \text{turn-down}) \% \text{ FSO}$ e.g. turn-down of 1:3: $\leq \pm (0.1 + 0.02 \times 3) \% \text{ FSO}$ i.e. accuracy is $\leq \pm 0.16 \% \text{ FSO}$

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] | $\leq \pm (0.2 \times \text{turn-down})$ | in compensated range -20 ... 80 °C |
| TC, average [% FSO / 10 K] | $\pm (0.02 \times \text{turn-down})$ | in compensated range -20 ... 80 °C |

| Permissible temperatures | |
|---------------------------|---------------|
| Medium | -25 ... 125°C |
| Electronics / environment | -25 ... 85°C |
| Storage | -40 ... 100°C |

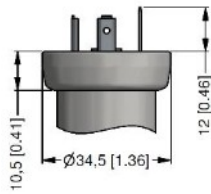
| Electrical protection | |
|-------------------------------|---|
| Short-circuit protection | permanent |
| Reverse polarity protection | no damage, but also no function |
| Electromagnetic compatibility | emission and immunity according to EN 61326 |

| 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 |

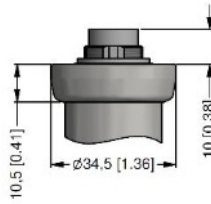
⁶ welded version only with pressure ports according to EN 837; welded version not available with pressure ranges > 60 bar

| 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 IIIC 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: $\mu\text{H}/\text{m}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Miscellaneous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Current consumption | signal output current: max. 25 mA signal output voltage: 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2-wire-system (current)</p> | <p>3-wire-system (voltage)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pin configuration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electrical connections | <table border="1"> <thead> <tr> <th></th> <th>ISO 4400</th> <th>Binder 723 (5-pin)</th> <th>Binder 723/423 (7-pin)</th> <th>M12x1 / metal (4-pin)</th> <th colspan="2">Bayonet MIL-C-26482 (10-6)</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2-wire</td> <td>3-wire</td> </tr> <tr> <td>Supply +</td> <td>1</td> <td>3</td> <td>3</td> <td>1</td> <td>A</td> <td>A</td> </tr> <tr> <td>Supply -</td> <td>2</td> <td>4</td> <td>1</td> <td>2</td> <td>B</td> <td>D</td> </tr> <tr> <td>Signal + (only for 3-wire)</td> <td>3</td> <td>1</td> <td>6</td> <td>3</td> <td>-</td> <td>B</td> </tr> <tr> <td>Communication interface RS232⁹</td> <td>RxD - TxD - GND -</td> <td>- - -</td> <td>4 5 7</td> <td>- - -</td> <td>- - -</td> <td>- - -</td> </tr> <tr> <td>Shield</td> <td>ground contact </td> <td>5</td> <td>2</td> <td>4</td> <td colspan="2">pressure port</td> </tr> </tbody> </table> | | 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 - TxD - GND - | - - - | 4 5 7 | - - - | - - - | - - - | Shield | ground contact | 5 | 2 | 4 | pressure port | |
| | 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 - TxD - GND - | - - - | 4 5 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 | <p>compact field housing</p> <p>V_{S+} V_{S-} S+ GND</p> | 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

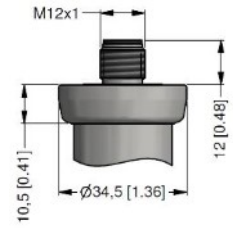
Electrical connections (dimensions mm / in)



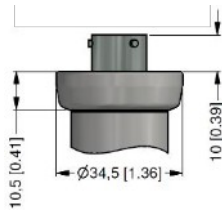
ISO 4400
(IP 65)



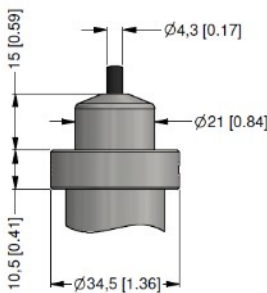
Binder series 723
(IP 67)



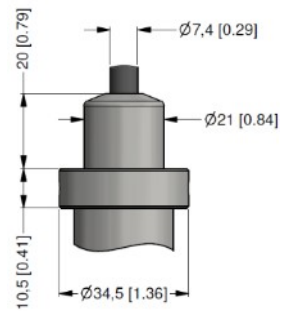
M12x1, 4-pin
(IP 67)



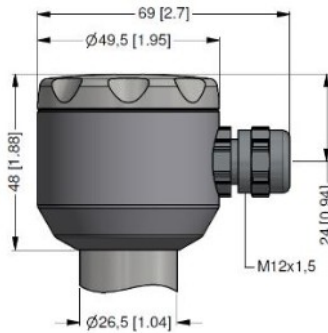
Bayonet MIL-C-26482 (10-6)
(IP 67)



cable outlet with PVC cable
(IP 67)¹⁰



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



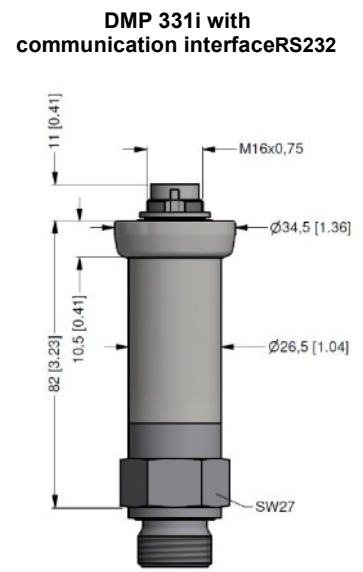
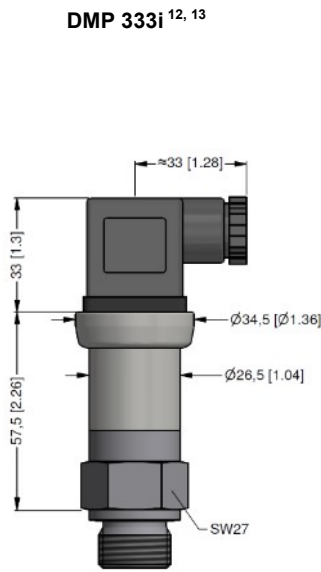
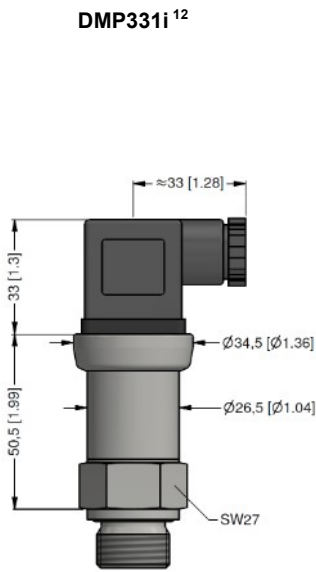
compact field housing
(IP 67)

⇒ 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

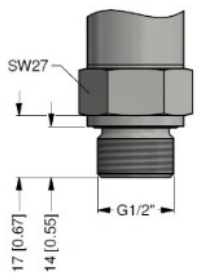
Dimensions (mm / in)



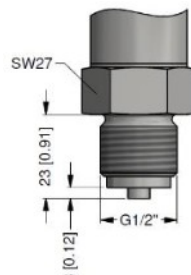
¹² with electrical connection Bayonet MIL-C-26482 (10-6) increases the length of devices by 5 mm

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

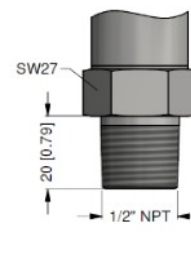
Mechanical connections (dimensions mm / in)



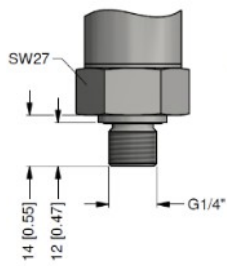
G1/2" DIN 3852



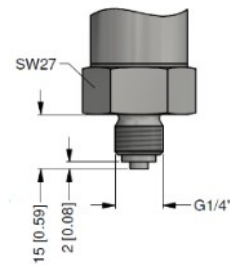
G1/2" EN 837



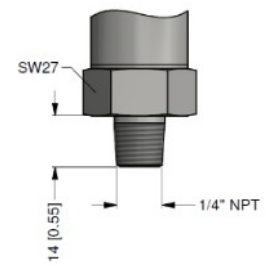
1/2" NPT



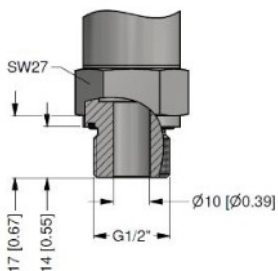
G1/4" DIN 3852



G1/4" EN 837



1/4" NPT

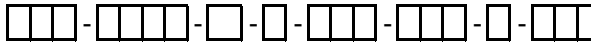


G1/2" open port DIN 3852
($p_N \leq 40$ bar)

↳ metric threads and others on request

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 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 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 0 |
| | male plug Binder series 723 (5-pin) | | 2 0 0 |
| | male plug Binder series 723 (7-pin) and female plug Binder series 423 (7-pin) | | A 0 0 |
| | 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 |
| 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 |
| 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 1 |
| | communication interface RS232 ⁷ | | 1 2 1 |
| | customer | | 9 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) Windows[®] is a registered trademark of Microsoft Corporation

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