

DMP 457



Pressure Transmitter for Shipbuilding and Offshore

Stainless Steel Sensor

accuracy according to EN IEC 62828-2:
standard: 0.35 % span
option: 0.25 % span

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Output signals

2-wire: 4 ... 20 mA
others on request

Special characteristics

- ▶ LR-certificate (Lloyd's Register)
- ▶ DNV-approval (Det Norske Veritas)
- ▶ ABS-certificate (American Bureau of Shipping)
- ▶ CCS-certificate (China Classification Society)
- ▶ flush pressure port
G 1/2" from 100 mbar
- ▶ excellent thermal behaviour

Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gases and dusts
- ▶ welded pressure port

The pressure transmitter DMP 457 has been especially designed for rough conditions occurring especially in shipbuilding and offshore applications. All gaseous and liquid media, which are compatible with stainless steel 1.4404 (316L) respectively can be used.

Sensor element is a piezoresistive stainless steel sensor with high accuracy and excellent long-term stability. In order to meet the special requirements for shipbuilding and offshore applications extensive tests had to be passed to get the Lloyd's Register (LR), Det Norske Veritas (DNV) and China Classification Society (CCS) approvals.

Preferred areas of use are

- ▶ Diesel engines, drives
- ▶ Compressors, pumps
- ▶ Boiler
- ▶ Hydraulic and pneumatic control systems
- ▶ Fuel and oil



DMP 457

Shipbuilding and Offshore

Technical Data

| Input pressure range ¹ | | | | | | | | | | | | | |
|-----------------------------------|---------------------|---|------|------|------|------|------|------------------------------------|------|------|------|----|--|
| Nominal pressure gauge | [bar] | -1 ... 0 | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 | |
| Nominal pressure abs. | [bar] | - | - | - | - | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 | |
| Level gauge / abs. | [mH ₂ O] | - | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | |
| Overpressure | [bar] | 5 | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 | |
| Burst pressure ≥ | [bar] | 7.5 | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 | |
| Nominal pressure gauge | [bar] | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 | | |
| Nominal pressure abs. | [bar] | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 | | |
| Level gauge / abs. | [mH ₂ O] | 100 | 160 | 250 | 400 | - | - | - | - | - | - | - | |
| Overpressure | [bar] | 40 | 80 | 80 | 105 | 210 | 600 | 600 | 1000 | 1000 | 1000 | | |
| Burst pressure ≥ | [bar] | 50 | 120 | 120 | 210 | 420 | 1000 | 1000 | 1250 | - | - | | |
| Vacuum resistance | | P _N ≥ 1 bar: unlimited vacuum resistance | | | | | | P _N < 1 bar: on request | | | | | |

¹ from 60 bar: measurement starts with ambient pressure

| 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} |
| Performance | |
| Accuracy ² | standard: nominal pressure < 0.4 bar: ≤ ± 0.5 % span nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % span option: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % span |
| Permissible load | R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω |
| Influence effects | supply: 0.05 % span / 10 V load: 0.05 % span / kΩ |
| Long term stability | ≤ ± 0.1 % span / year by reference conditions |
| Response time | < 10 msec |

² accuracy according to EN IEC 62828-2- limit point adjustment (non-linearity, hysteresis, repeatability)

| Thermal effects (Offset and Span) / Permissible temperatures | | | |
|--|----------|-----------------------|--|
| Nominal pressure P _N | [bar] | -1 ... 0 | < 0.4 |
| Tolerance band | [% span] | ≤ ± 0.75 | ≤ ± 1 |
| in compensated range | [°C] | -20 ... 85 | 0 ... 70 |
| 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 - DNV (Det Norske Veritas) |

| Mechanical stability | |
|----------------------|---|
| Vibration | 4 g (according to DNV: class B, curve 2 / basis: IEC 60068-2-6) |

| Materials | |
|----------------------|---|
| Pressure port | stainless steel 1.4404 (316L) |
| Housing | standard: stainless steel 1.4404 (316L) option field housing: stainless steel 1.4404 (316L), with cable gland |
| Cable sheath | TPE -U (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil) |
| Seals (media wetted) | standard: FKM option: welded version ³ others on request |
| Diaphragm | stainless steel 1.4435 (316L) |
| Media wetted parts | pressure port, seals, diaphragm |

³ welded version only with pressure ports according to EN 837; possible for nominal pressure ranges P_N ≤ 40 bar

| | | |
|---|---|---------------------------------|
| Lloyd's Register (for p _N ≤ 160 bar) | EMV1, EMV2, EMV3, EMV4 | number of certificate: 13/20055 |
| Det Norske Veritas (DNV) | temperature: humidity: vibration: electromagnetic compatibility: enclosure: | D B B B D |

| Explosion protection | |
|--|--|
| Approvals DX9-DMP 457 | IBExU 10 ATEX 1122 X / IECEx IBE 13.0051X zone 0: II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T135°C Da |
| Safety technical maximum values | U _i = 28 V, I _i = 93 mA, P _i = 660 mW, L _i ≈ 0 μH with field housing: C _i = 105 nF with cable outlet: C _i = 84.7 nF with ISO 4400: C _i = 62.2 nF the supply connections have an inner capacity of max. 90 nF (140 nF with field housing) 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 ... 70 °C (lower temperature limit depends on the type of cable used) |
| 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 |

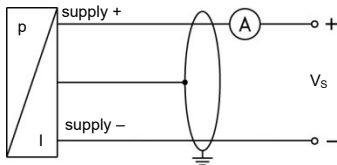
| Miscellaneous | |
|-----------------------|---|
| Current consumption | max. 25 mA |
| Weight | approx. 140 g (with ISO 4400) |
| Installation position | any ⁴ |
| Operational life | 100 million load cycles |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁵ |
| ATEX Directive | 2014/34/EU |

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.

⁵ This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagram

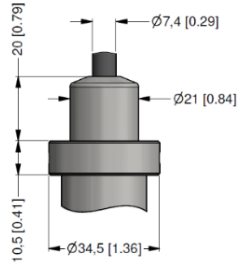
2-wire-system (current)



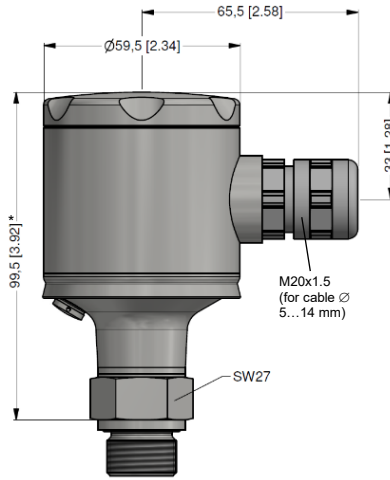
Pin configuration

| Electrical connection | ISO 4400 | field housing (clamp section: 2.5 mm ²) | cable colours (IEC 60757) |
|-----------------------|------------|--|---------------------------|
| Supply + | 1 | V _s + | WH (white) |
| Supply - | 2 | V _s - | BN (brown) |
| Shield | ground pin | | GNYE (green-yellow) |

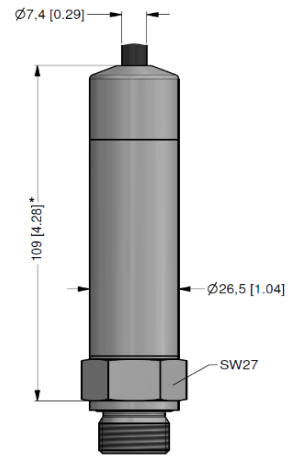
Electrical connections ⁶ (dimensions in mm)



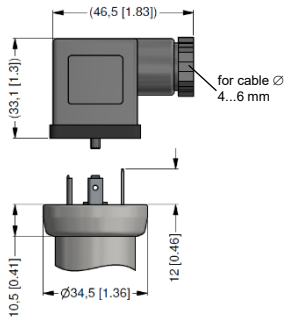
cable outlet ^{7,8}
(IP 68)



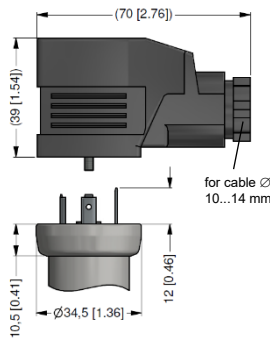
universal field housing
(IP 67)



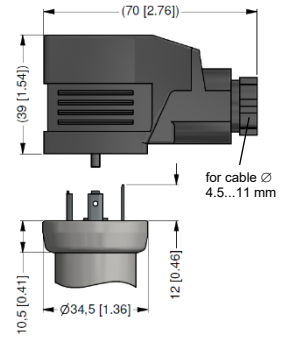
submersible version ⁸
(IP 68)



ISO 4400 - Code G10
(IP 65)



ISO 4400 - Code G00
(IP 65)



ISO 4400 - Code G01
(IP 65)

⁶ Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.

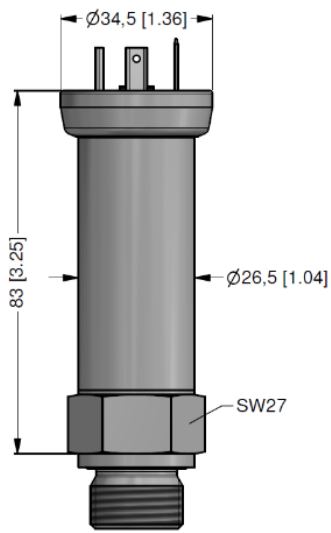
⁷ tested at 4 bar or 40 mH₂O for 24 hours

⁸ shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges absolute, the air tube is closed); different lengths available

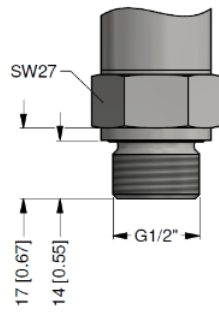
* total lengths increase by 9 mm for pN ≥ 100 bar with the optional accuracy ≤ ± 0.25 % span

Mechanical connection (dimensions in mm)

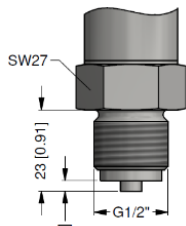
Standard



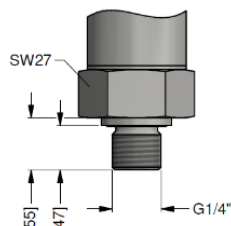
G1/2" DIN 3852



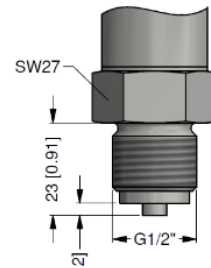
Option



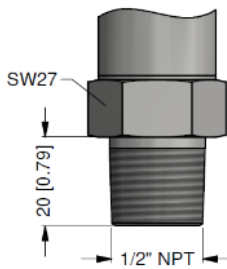
G1/2" EN 837



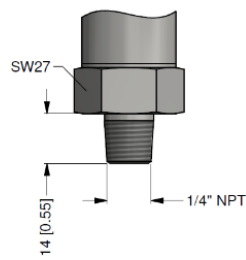
G1/4" DIN 3852



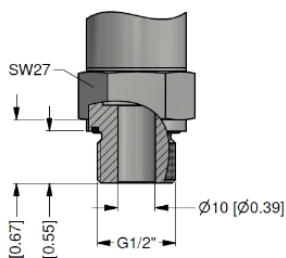
G1/4" EN 837



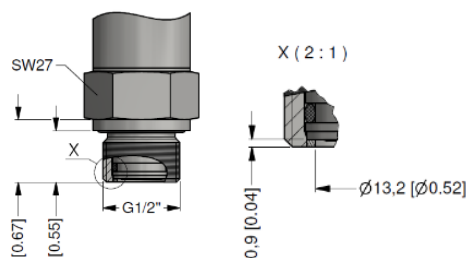
1/2" NPT



1/4" NPT



G1/2" flush DIN 3852
(up to 40 bar)



G1/2" open port DIN 3852
(up to 40 bar)

DMP 457

Shipbuilding and Offshore

Technical Data

The manufacturer provides the EU declaration of conformity.

Calibration - All production undergoes output control, which is performed by comparison with standards. The traceability of standards and working gauges is ensured in accordance with Act No. 505/1990, as amended, on metrology.

The manufacturer offers the possibility to supply sensors calibrated in the calibration laboratory of BD SENSORS, accredited according to ČSN EN ISO / IEC 17025: 2018.

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Ordering code DMP 457

23.08.2024

DMP 457

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Pressure

| | |
|--|-------|
| Gauge ¹ | 6 0 0 |
| Absolute (P _N > 0,4 bar) | 6 0 1 |
| Measured value in m H ₂ O gauge ¹ | 6 0 2 |
| Measured value in m H ₂ O absolute (P _N > 0,4 bar) | 6 0 3 |

Input [mH₂O] [bar]

| | | |
|-----------|---------------------------------------|---------|
| 0 ... 1 | 0 ... 0,1 (P _N > 0,4 bar) | 1 0 0 0 |
| 0 ... 1,6 | 0 ... 0,16 (P _N > 0,4 bar) | 1 6 0 0 |
| 0 ... 2,5 | 0 ... 0,25 (P _N > 0,4 bar) | 2 5 0 0 |
| 0 ... 4 | 0 ... 0,4 | 4 0 0 0 |
| 0 ... 6 | 0 ... 0,6 | 6 0 0 0 |
| 0 ... 10 | 0 ... 1 | 1 0 0 1 |
| 0 ... 16 | 0 ... 1,6 | 1 6 0 1 |
| 0 ... 25 | 0 ... 2,5 | 2 5 0 1 |
| 0 ... 40 | 0 ... 4 | 4 0 0 1 |
| 0 ... 60 | 0 ... 6 | 6 0 0 1 |
| 0 ... 100 | 0 ... 10 | 1 0 0 2 |
| 0 ... 160 | 0 ... 16 | 1 6 0 2 |
| 0 ... 250 | 0 ... 25 | 2 0 0 2 |
| 0 ... 400 | 0 ... 40 | 4 0 0 2 |
| | 0 ... 60 | 6 0 0 2 |
| | 0 ... 100 | 1 0 0 3 |
| | 0 ... 160 | 1 6 0 3 |
| | 0 ... 250 | 2 5 0 3 |
| | 0 ... 400 | 4 0 0 3 |
| | 0 ... 600 | 6 0 0 3 |
| | - 1... 0 | X 1 0 2 |

| | |
|--------------------------|---------|
| Customer | 9 9 9 9 |
| Customer - underpressure | X X X X |

Output

| | |
|---------------------------------------|---|
| 4 ... 20 mA / 2-wire | 1 |
| Intrinsic safety 4 ... 20 mA / 2-wire | E |
| Customer | 9 |

Accuracy

| | |
|-----------------------------------|---|
| 0,5 % (P _N < 0,4 bar) | 5 |
| 0,35 % (P _N ≥ 0,4 bar) | 3 |
| 0,25 % (P _N ≥ 0,4 bar) | 2 |
| Customer | 9 |

Electrical connection

| | |
|---|-------|
| ISO 4400 (for cable Ø 4...6 mm) | G 1 0 |
| ISO 4400 GL (for cable Ø 10...14 mm, GL approbated) | G 0 0 |
| ISO 4400 GL (for cable Ø 4,5...11 mm, GL approbated) | G 0 1 |
| Cable outlet, cable with ventilation tube (IP 68) ² + TPE-U cable / 1 m | T R 3 |
| Field housing stainless steel, cable gland M 20 x 1,5 (IP 67) | 8 8 0 |
| Customer | 9 9 9 |

Mechanical connection

| | |
|---|-------|
| G 1/2" DIN 3852 | 1 0 0 |
| G 1/2" EN 837 | 2 0 0 |
| G 1/4" DIN 3852 | 3 0 0 |
| G 1/4" EN 837 | 4 0 0 |
| G 1/2" DIN 3852 with flush sensor; pressure port only (P _N ≤ 40 bar) | F 0 0 |
| G 1/2" DIN 3852 open pressure port (P _N ≤ 40 bar) | H 0 0 |
| 1/2" NPT | N 0 0 |
| 1/4" NPT | N 4 0 |
| Customer | 9 9 9 |

Seals



| | | | | |
|--|---|---|---|---|
| Viton (FKM) | 1 | | | |
| Without seals - welded (only with EN 837) ³ | 2 | | | |
| Customer | 9 | | | |
| Special version | | | | |
| Standard | | 0 | 0 | 0 |
| Customer | | 9 | 9 | 9 |

0,-...without additional charge

On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.

This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet.

BD SENSORS reserves the right to change sensor specifications without further notice.

1 from 60 bar: measurement starts with ambient pressure

2 shielded TPE-U-cable with ventilation tube available in different lengths

3 welded version only with pressure ports according to EN 837; possible with pressure ranges $P_N \leq 40$ bar

