# DMK 458

## Pressure Transmitter for Marine and Offshore

## Ceramic Sensor

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

DMK 458
Transmitter for Marine and Offshore

**Nominal pressure:**

from 0 ... 40 mbar
up to 0 ... 20 bar

**Output signal:**

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

**Product characteristics**

- GL-shipping approval (Germanischer Lloyd)
- DVN-certificate (Det Norske Veritas)
- CCS-certificate (China Classification Society)
- high overpressure resistance
- excellent long term stability

**Optional versions**

- IS-version
  Ex ia= intrinsically safe for gases and dusts
- diaphragm $Al_2O_3$ 99.9 %
- pressure port CuNiFe

The pressure transmitter DMK 458 has been developed for marine and offshore applications. In addition to thread connections, different flush versions are available, which are especially suitable for pasty, viscous, and polluted media.

Due to the capacitive ceramic sensor developed by BD|SENSORS, which is optionally available in $Al_2O_3$ 99.9 %, the DMK 458 shows an outstanding accuracy as well as a high overload and temperature resistance.

**Preferred areas of use are**

- Monitoring of pressure during loading and unloading processes
- Monitoring of a ship´s position and draught
- Use in anti-heeling systems
- Level measurement in ballast and storage tanks

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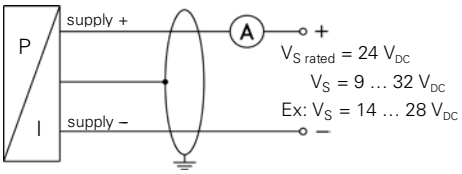
| **Pressure ranges** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal pressure [1] | [bar] | 0.04 | 0.06 | 0.1 | 0.16 | 0.25 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 20 |
| Level | [$mH_2O$] | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 200 |
| Overpressure | [bar] | 2 | 2 | 4 | 4 | 6 | 6 | 8 | 8 | 15 | 25 | 25 | 35 | 35 | 45 | 45 |
| Permissible vacuum | [bar] | -0.2 | | -0.3 | | -0.5 | | | | -1 | | | | | | |
| *[1] available in gauge, sealed gauge and absolute; nominal pressure ranges sealed gauge and absolute from 1 bar* | | | | | | | | | | | | | | | | |

| **Output signal / Supply** | | |
|---|---|---|
| Standard | 2-wire: 4 ... 20 mA / $V_S$ = 9 ... 32 $V_{DC}$ | $V_{S\ rated}$ = 24 $V_{DC}$ |
| Option IS-version | 2-wire: 4 ... 20 mA / $V_S$ = 14 ... 28 $V_{DC}$ | $V_{S\ rated}$ = 24 $V_{DC}$ |
| **Performance** | | |
| Accuracy [2] | standard: ≤ ± 0.25 % FSO<br>option: for $P_N$ ≥ 0.6 bar [3]: ≤ ± 0.1 % FSO | |
| Permissible load | $R_{max} = [(V_S - V_{S\ min}) / 0.02]\ \Omega$ | |
| Long term stability | ≤ ± 0.1 % FSO / year | |
| Influence effects | supply: 0.05 % FSO / 10 V<br>load: 0.05 % FSO / kΩ | |
| Turn-on time | 700 msec | |
| Mean response time | < 200 msec | mean measuring rate 5/sec |
| Max. response time | 380 msec | |
| *[2] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)*<br>*[3] Under the influence of disturbance burst according to EN 61000-4-4 (2004) +2 kV accuracy decreases on ≤ ± 0.25 % FSO.* | | |
| **Thermal effects** | | |
| Thermal error | ≤ ± 0.1 % FSO / 10 K | in compensated range -20 ... 80 °C |
| **Permissible temperatures** | | |
| Permissible temperatures | medium: -40 ... 125 °C<br>electronics / environment: -25 ... 85 °C<br>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 and Germanischer Lloyd (GL) | |
| **Mechanical stability** | | |
| Vibration | 4 g (according to GL: curve 2 / basis: DIN EN 60068-2-6) | |
| **Materials** | | |
| Pressure port | standard: stainless steel 1.4404 (316 L)<br>option for threaded connections: CuNi10Fe1Mn - on request | |
| Housing | stainless steel 1.4404 (316 L) | |
| Cable sheath<br>for version cable outlet | PUR | |
| Cable gland<br>for version field housing | absolute, sealed gauge: brass, nickel plated<br>gauge: polyamide (with integrated pressure reference) | others on request |
| Seals (media wetted) | FKM -40 ... 200 °C; others on request | |
| Diaphragm | standard: ceramics $Al_2O_3$ 96 %<br>option: ceramics $Al_2O_3$ 99.9 % | |
| Media wetted parts | pressure port, seals, diaphragm | |
| **IS protection (only for 4 ... 20 mA / 2-wire)** | | |
| Approval DX14A-DMK 458 | field housing: zone 0: II 1G Ex ia IIC T4<br>ISO 4400, M12x1, cable outlet: zone 0: II 1G Ex ia IIB T4 | |
| Safety technical<br>maximum values | $U_i$ = 28 V; $I_i$ = 93 mA; $P_i$ = 660 mW<br>field housing: $C_i$ = 52.3 nF; $L_i$ = 5 µH; 90.2 nF opposite GND<br>ISO 4400, M12x1, cable outlet: $C_i$ = 105 nF; $L_i$ = 5 µH; 140 nF opposite GND | |
| Permissible temperatures for environment | in zone 0: -20 ... 60 °C with $p_{atm}$ 0.8 bar up to 1.1 bar<br>zone 1 and higher: -25 ... 70 °C | |
| Permissible temperatures for medium | -40 ... 85 °C | |
| **Miscellaneous** | | |
| Ingress protection | IP65, IP 67, IP68 | |
| Installation position | any | |
| Current consumption | max. 21 mA | |
| Weight | min. 400 g (depending on housing and mechanical connection) | |
| Operational life | > 100 x $10^6$ cycles | |
| CE conformity | EMC Directive: 2004/108/EC | |
| ATEX Directive | 94/9/EC | |

**Wiring diagram**

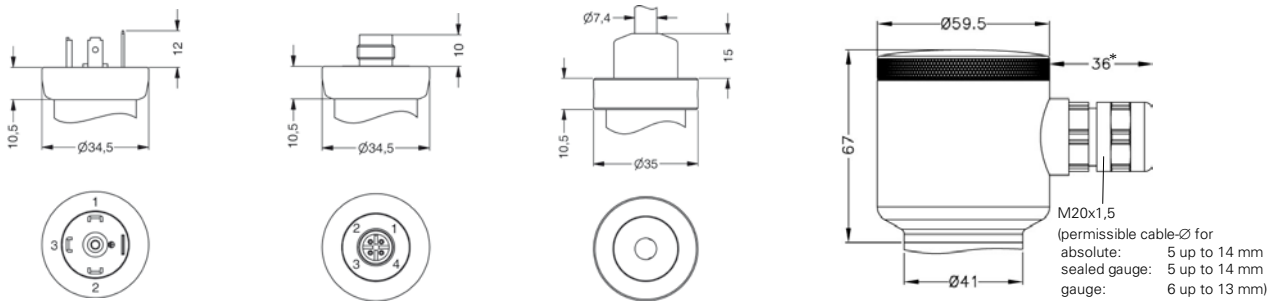
2-wire system (current)




**Pin configuration**

| Electrical connections | ISO 4400 | field housing (clamp section: 2.5 mm²) | M12x1 (4-pin) metal | cable colours (DIN 47100) |
|---|---|---|---|---|
| Supply + | 1 | VS+ | 1 | wh (white) |
| Supply – | 2 | VS- | 2 | bn (brown) |
| Shield | ground contact | ⏚ | 4 | gn/ye (green / yellow) |

**Electrical connections (dimensions in mm)**



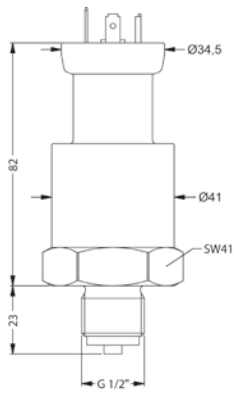

ISO 4400 (IP 65) | M12x1 4-pin (IP 67) | cable outlet with PUR-cable without air tube [4] (IP 68) | field housing (IP 67)

* for gauge pressure ranges with field housing the marked dimension increases by 8 mm

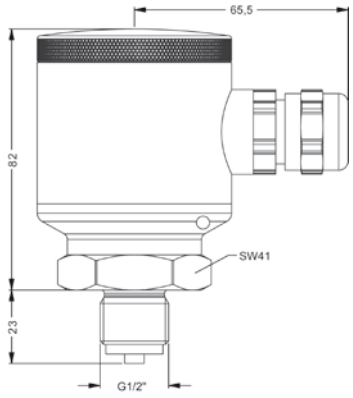
*[4] cable versions are delivered with shielded cable (different cable types and lengths available); for gauge pressure cable with ventilation tube required; tested at 4 bar or 40 m$H_2O$ for 24 hours*

**Dimensions (in mm)**

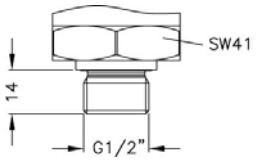
**Inch thread**



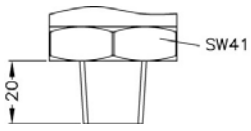

G1/2" EN 837
with plug version and cable outlet




G1/2" EN 837
with field housing




G1/2" DIN 3852

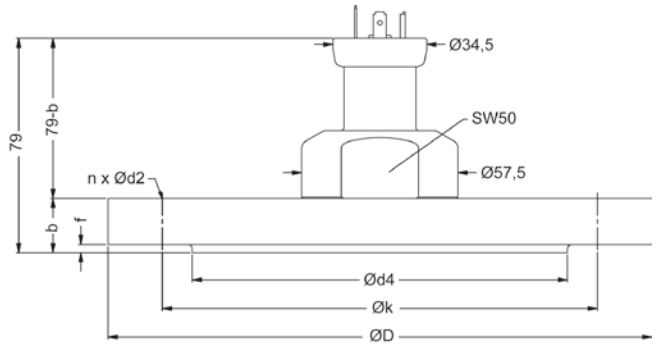



1/2" NPT

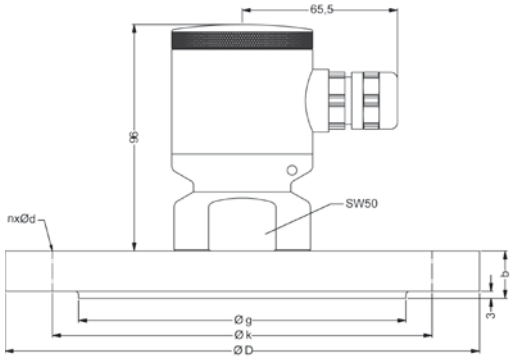
⇨ For version field housing with pressure port in CuNi10Fe1Mn, total length increases by 27 mm!

## Dimensions (in mm)

### Flange [5] (DIN 2501)




with plug version and cable outlet

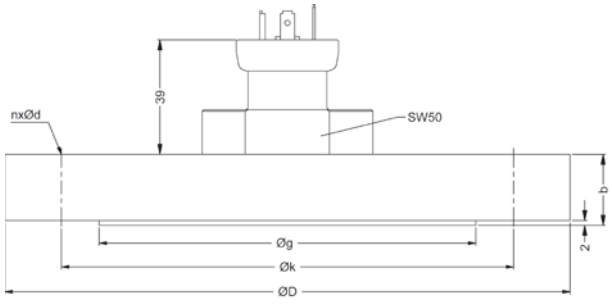



with field housing

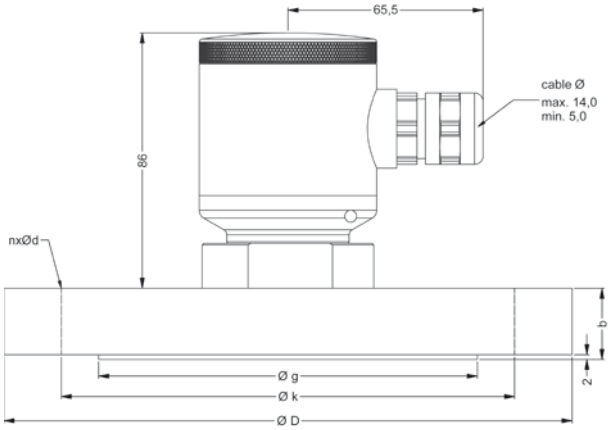
| dimensions in mm | | | | |
|---|---|---|---|---|
| Maß | DN25/PN40 | DN40/PN40 | DN50/PN40 | DN80/PN16 |
| D | 115 | 150 | 165 | 200 |
| k | 85 | 110 | 125 | 160 |
| d4 | 68 | 88 | 102 | 138 |
| b | 18 | 18 | 20 | 20 |
| f | 2 | 3 | 3 | 3 |
| n | 4 | 4 | 4 | 8 |
| d2 | 14 | 18 | 18 | 18 |

| dimensions in mm | | | | |
|---|---|---|---|---|
| Maß | DN25/PN40 | DN40/PN40 | DN50/PN40 | DN80/PN16 |
| D | 115 | 150 | 165 | 200 |
| k | 85 | 110 | 125 | 160 |
| g | 68 | 88 | 102 | 138 |
| b | 18 | 18 | 20 | 20 |
| n | 4 | 4 | 4 | 8 |
| d | 14 | 18 | 18 | 18 |

### Flange [5] (ANSI)




with plug version and cable outlet




with field housing

| dimensions in mm | | |
|---|---|---|
| size | 2"/150 lbs | 3"/150 lbs |
| D | 152.4 | 190.5 |
| g | 91.9 | 127 |
| k | 120.7 | 152.4 |
| b | 19.1 | 23.9 |
| n | 4 | 4 |
| d | 19.1 | 19.1 |

⇨ For version field housing with pressure port in CuNi10Fe1Mn, total length increases by 27 mm!

*[5] DN80/PN16 possible for nominal pressure ranges $P_N \leq 16$ bar; 2"/150 lbs and 3"/150 lbs possible for nominal pressure ranges $P_N \leq 10$ bar*





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# Ordering code DMK 458

## DMK 458 □□□-□□□□-□-□-□□□-□□□-□-□-□-□□□

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pressure** | | | | | | | | | | | | | | | | | | | | | |
| in bar, gauge | | | | 5 | 9 | A | | | | | | | | | | | | | | | |
| in bar, absolute [1] | | | | 5 | 9 | B | | | | | | | | | | | | | | | |
| in bar, sealed gauge [1] | | | | 5 | 9 | E | | | | | | | | | | | | | | | consult |
| in $mH_2O$, gauge | | | | 5 | 9 | C | | | | | | | | | | | | | | | |
| in $mH_2O$, absolute [1] | | | | 5 | 9 | D | | | | | | | | | | | | | | | consult |
| in $mH_2O$, sealed gauge [1] | | | | 5 | 9 | F | | | | | | | | | | | | | | | consult |
| **Input** | [$mH_2O$] | [bar] | | | | | | | | | | | | | | | | | | | |
| | 0.4 | 0.04 | | | | 0 | 4 | 0 | 0 | | | | | | | | | | | | |
| | 0.6 | 0.06 | | | | 0 | 6 | 0 | 0 | | | | | | | | | | | | |
| | 1.0 | 0.1 | | | | 1 | 0 | 0 | 0 | | | | | | | | | | | | |
| | 1.6 | 0.16 | | | | 1 | 6 | 0 | 0 | | | | | | | | | | | | |
| | 2.5 | 0.25 | | | | 2 | 5 | 0 | 0 | | | | | | | | | | | | |
| | 4.0 | 0.40 | | | | 4 | 0 | 0 | 0 | | | | | | | | | | | | |
| | 6.0 | 0.60 | | | | 6 | 0 | 0 | 0 | | | | | | | | | | | | |
| | 10 | 1.0 | | | | 1 | 0 | 0 | 1 | | | | | | | | | | | | |
| | 16 | 1.6 | | | | 1 | 6 | 0 | 1 | | | | | | | | | | | | |
| | 25 | 2.5 | | | | 2 | 5 | 0 | 1 | | | | | | | | | | | | |
| | 40 | 4.0 | | | | 4 | 0 | 0 | 1 | | | | | | | | | | | | |
| | 60 | 6.0 | | | | 6 | 0 | 0 | 1 | | | | | | | | | | | | |
| | 100 | 10 | | | | 1 | 0 | 0 | 2 | | | | | | | | | | | | |
| | 160 | 16 | | | | 1 | 6 | 0 | 2 | | | | | | | | | | | | |
| | 200 | 20 | | | | 2 | 0 | 0 | 2 | | | | | | | | | | | | |
| | customer | | | | | 9 | 9 | 9 | 9 | | | | | | | | | | | | consult |
| **Output** | | | | | | | | | | | | | | | | | | | | | |
| 4 ... 20 mA / 2-wire | | | | | | | | | | 1 | | | | | | | | | | | |
| Intrinsic safety 4 ... 20 mA / 2-wire | | | | | | | | | | E | | | | | | | | | | | |
| customer | | | | | | | | | | 9 | | | | | | | | | | | consult |
| **Accuracy** | | | | | | | | | | | | | | | | | | | | | |
| standard: 0.25% | | | | | | | | | | | 2 | | | | | | | | | | |
| option for $P_n$ > 0.6 bar: 0.10% | | | | | | | | | | | 1 | | | | | | | | | | |
| customer | | | | | | | | | | | 9 | | | | | | | | | | consult |
| **Electrical connection** | | | | | | | | | | | | | | | | | | | | | |
| Male and female plug ISO 4400 [2] (for cable Ø 4 ... 6 mm) | | | | | | | | | | | | G | 1 | 0 | | | | | | | |
| Male and female plug ISO 4400 GL [2] (for cable Ø 10 ... 14 mm) | | | | | | | | | | | | G | 0 | 0 | | | | | | | |
| Male and female plug ISO 4400 GL [2] (for cable Ø 4.5 ... 11 mm) | | | | | | | | | | | | G | 0 | 1 | | | | | | | |
| Male plug M12x1 (4-pin) / metal version | | | | | | | | | | | | M | 1 | 0 | | | | | | | |
| Cable outlet with PUR-cable (with ventilation tube) | | | | | | | | | | | | T | R | 1 | | | | | | | |
| Field housing, absolute, sealed gauge | | | | | | | | | | | | 8 | 8 | 0 | | | | | | | |
| customer | | | | | | | | | | | | 9 | 9 | 9 | | | | | | | consult |
| **Mechanical connection** | | | | | | | | | | | | | | | | | | | | | |
| G 1/2" DIN 3852 | | | | | | | | | | | | | | | 1 | 0 | 0 | | | | |
| G 1/2" EN 837 | | | | | | | | | | | | | | | 2 | 0 | 0 | | | | |
| 1/2" NPT | | | | | | | | | | | | | | | N | 0 | 0 | | | | |
| Flange DN 25 / PN 40 (DIN 2501) | | | | | | | | | | | | | | | F | 2 | 0 | | | | |
| Flange DN 40 / PN 40 ( DIN 2501) | | | | | | | | | | | | | | | F | 2 | 2 | | | | |
| Flange DN 50 / PN 40 (DIN 2501) | | | | | | | | | | | | | | | F | 2 | 3 | | | | |
| Flange DN 80 / PN 16 ( DIN 2501) [3] | | | | | | | | | | | | | | | F | 1 | 4 | | | | |
| Flange DN 2" / 150 lbs (ANSI B 16.5) | | | | | | | | | | | | | | | F | 3 | 2 | | | | |
| Flange DN 3" / 150 lbs (ANSI B 16.5) | | | | | | | | | | | | | | | F | 3 | 3 | | | | |
| customer | | | | | | | | | | | | | | | 9 | 9 | 9 | | | | consult |
| **Seals** | | | | | | | | | | | | | | | | | | | | | |
| FKM | | | | | | | | | | | | | | | | | | 1 | | | |
| andere | | | | | | | | | | | | | | | | | | 9 | | | consult |
| **Pressure port** | | | | | | | | | | | | | | | | | | | | | |
| Stainless steel 1.4404 (316L) | | | | | | | | | | | | | | | | | | | 8 | | |
| Copper-Nickel-alloy (CuNi10Fe1Mn) [4] | | | | | | | | | | | | | | | | | | | K | | consult |
| customer | | | | | | | | | | | | | | | | | | | 9 | | consult |





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BD SENSORS®
pressure measurement

# Ordering code DMK 458

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| | | | | | |
|---|---|---|---|---|---|
| **Diaphragm** | | | | | |
| Ceramics $Al_2O_3$ 96% | 2 | | | | |
| Ceramics $Al_2O_3$ 99.9% | C | | | | |
| customer | 9 | | | | consult |
| **Special version** | | | | | |
| standard | | 0 | 0 | 0 | |
| customer | | 9 | 9 | 9 | consult |

[1] nominal pressure ranges absolute and sealed gauge from 1 bar
[2] female plug is GL-approbated
[3] DN80/PN16 possible for nominal pressure ranges PN ≤ 16 bar; 2"/150 lbs and 3"/150 lbs possible for nominal pressure ranges PN≤ 10 bar
[4] CuNi10Fe1Mn only possible in combination with inch thread





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