



## **DMK 458**

# Pressure Transmitter for Marine and Offshore

Ceramic Sensor

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

### **Nominal pressure**

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

#### **Output signals**

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

#### **Product characteristics**

- ► LR-certificate (Lloyd's Register)
- DNV-approval (Det Norske Veritas)
- ABS-certificate (American Bureau of Shipping)
- CCS-certificate (China Classification Society)
- high overpressure resistance
- excellent long term stability

#### **Optional versions**

- IS-versionEx ia= intrinsically safe for gases
- ▶ diaphragm Al<sub>2</sub>O<sub>3</sub> 99.9 %
- pressure port in CuNiFe (sea water resistant)

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.

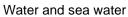
#### Preferred areas of use are



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















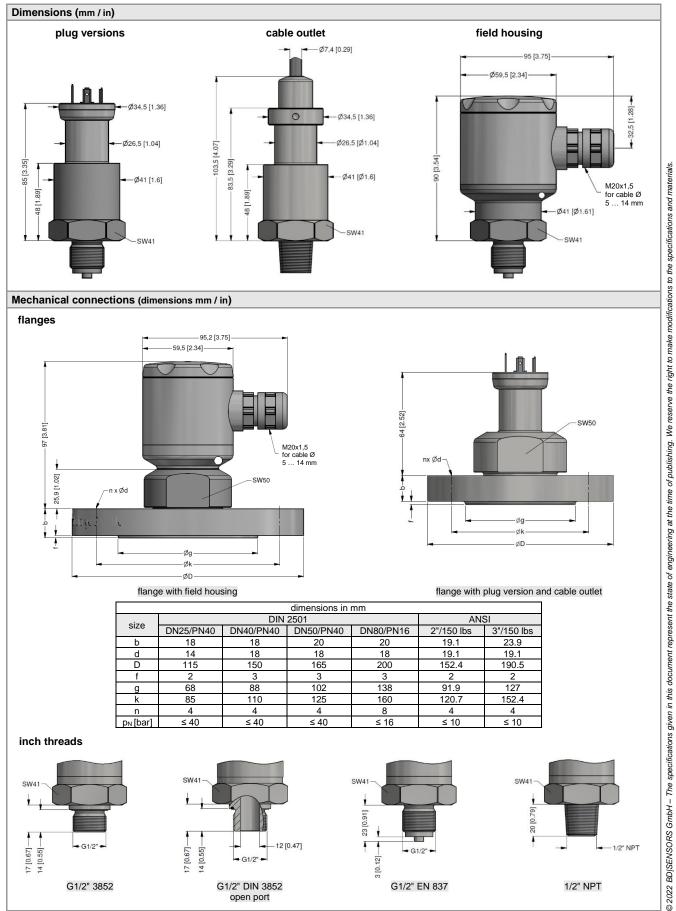
Pressure ranges																
Nominal pressure 1	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]	-0	.2	-(	0.3		-0	.5		-1						
<sup>1</sup> available in gauge and absolute; nominal pressure ranges absolute from 1 bar																

available in gauge and absolute, norm	al pressure ranges absolute from 1 bar								
Output signal / Supply									
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 9 32 V <sub>DC</sub>	$V_{S rated} = 24 V_{DC}$							
Option IS-version	2-wire: 4 20 mA / V <sub>S</sub> = 14 28 V <sub>DC</sub>	$V_{S rated} = 24 V_{DC}$							
Performance									
Accuracy <sup>2</sup>	standard: ≤ ± 0.25 % FSO	option for $p_N \ge 0.6$ bar <sup>3</sup> : $\le \pm 0.1$ % FSO							
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$								
Long term stability	≤ ± 0.1 % FSO / year at reference conditions								
Influence effects	supply: 0.05 % FSO / 10 V	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								
	it point adjustment (non-linearity, hysteresis, repeatability)	2000 and 1 0 25 % FSO							
	at according to EN 61000-4-4 (2004) +2 kV accuracy decrea	ases on \$ ± 0.25 % FSO							
Thermal effects (offset and span)									
Tolerance band	≤ ± 1 % FSO   -20 80 °C								
in compensated range	-20 60 °C								
Permissible temperatures	40, 405,00								
Medium	-40 125 °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 - DNV (D	Det Norske Veritas)							
Mechanical stability	- EN 01320 - DNV (D	et Noiske Veillas)							
Vibration	4 g (according to DNV: Class B, curve 2 / basis: IB	EC 60069 2 6)							
	4 9 (according to Divv. Class B, curve 27 basis. In	EC 60006-2-6)							
Materials									
Pressure port		t) - only for G1/2" open pressure port and in 0Fe1Mn (not possible with field housing) -							
Housing	standard: stainless steel 1.4404 (316 L) option: CuNi10Fe1Mn (sea water resistant in CuNi10Fe1Mn -	t) - only in combination with pressure port							
Option field housing (not possible with CuNi10Fe1Mn)	stainless steel 1.4404 (316L) cable gland: absolute, sealed gauge: brass, nickel plated gauge: brass, nickel plated polyamide (with integrated pressure reference)								
Cable sheath for option cable outlet		eased resistance against oil and gasoline,							
Seals (media wetted)	FKM	others on request							
Diaphragm	standard: ceramics Al <sub>2</sub> O <sub>3</sub> 96 % option: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %								
Media wetted parts	pressure port, seals, diaphragm	<u> </u>							
Category of the environment									
Lloyd's Register (LR)	EMV1, EMV2, EMV3 <sup>4</sup> , EMV4	number of certificate: 13/20055							
Det Norske Veritas (DNV)	temperature: D vibration: B	number of certificate: TAA00001GR							
,	humidity: B enclosure: D electromagnetic compatibility: B								
<sup>4</sup> not valid for IS-version (DX14A-DMK 4	58)								
Explosion protection									
Approval DX14A-DMK 458  Safety technical	IBExU 07 ATEX 1180 X   field housing:   zone 0: II 1G Ex ia IIC T4 Ga   ISO 4400, M12x1, cable outlet:   zone 0: II 1G Ex ia IIB T4 Ga   U <sub>i</sub> = 28 V; I <sub>i</sub> = 93 mA; P <sub>i</sub> = 660 mW; L <sub>i</sub> = 0 μH								
maximum values	field housing: $C_i = 52.3 \text{ nF}$ ; 90.2 nF opposite GND ISO 4400, M12x1, cable outlet: $C_i = 105 \text{ nF}$ ; 140 nF opposite GND								
	in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar zone 1 and higher: -25 70 °C								
Permissible temperatures for environment  Permissible temperatures for		1 up to 1.1 bui							

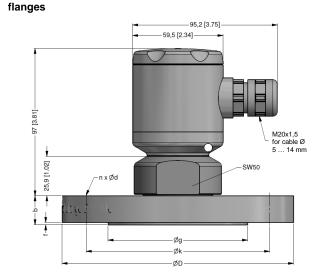


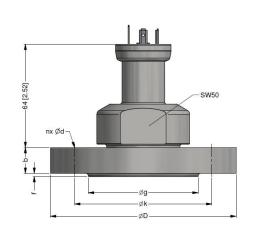
Miscellaneous									
Ingress protection	IP 65, IP 67, IP 68								
Installation position	any								
Current consumption	max. 21 mA								
Weight	min. 400 g (depending on housing and mechanical connection)								
Operational life	100 million load cycles								
CE conformity	EMC Directive: 2014/30	/FII							
ATEX Directive	2014/34/EU	720							
	2014/34/EU								
Wiring diagram									
2-wire-system (current)  p  supply +  Vs  vs									
Pin configuration									
Electrical connection	ISO 4400	field become	M4Ond (4 min)						
Electrical Connection	150 4400	field housing (clamp section: 2.5 mm <sup>2</sup> )	M12x1 (4-pin), metal	cable colours					
	3 GND GND	V <sub>S+</sub> V <sub>S</sub> . GND	4	(IEC 60757)					
Supply +	1	V <sub>S</sub> +	1	WH (white)					
Supply –	2	V <sub>S</sub> -	2	BN (brown)					
Shield	ground pin 🕀	GND	4	GNYE (green-yellow					
Electrical connections (dimensions									
(46,5 [1.83])	-	(70 [2.76])	_	(70 [2.76])					
	cable Ø (1,54).	for cable Ø	(39 [1.54])	for cable Ø					
0 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10,5 [0.41]	1014 mm	001.01 0.01 0.04.15 0.04.15	3.6] - 4.511 mm					
ISO 4400 - <b>code G10</b> (IP 65)		0 - <b>code G00</b> IP 65)	ISO 4400 - <b>c</b> (IP 6						
M12x1 -Ø34,5 [1.36]	10.5 [0.41]	Ø7,4 [0.29]  Ø21 [0.84]	95 Ø59,5 [2.34]	M20x1.5 for cable Ø 5 14 mm					
			<b>→</b>	<b>→</b> Ø41 [Ø1.61]					

<sup>5</sup> cable versions are delivered with shielded cable (different lengths available); for gauge pressure cable with ventilation tube required; tested at 4 bar or 40 mH<sub>2</sub>O for 24 hours



#### Mechanical connections (dimensions mm / in)



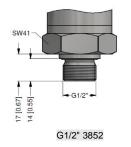


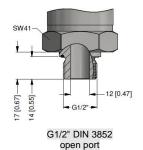
flange with field housing

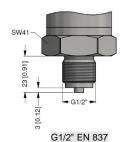
flange with plug version and cable outlet

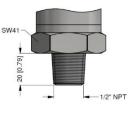
dimensions in mm									
size		DIN	ANSI						
	DN25/PN40	DN40/PN40	DN50/PN40	DN80/PN16	2"/150 lbs	3"/150 lbs			
b	18	18	20	20	19.1	23.9			
d	14	18	18	18	19.1	19.1			
D	115	150	165	200	152.4	190.5			
f	2	3	3	3	2	2			
g	68	88	102	138	91.9	127			
k	85	110	125	160	120.7	152.4			
n	4	4	4	8	4	4			
p <sub>N</sub> [bar]	≤ 40	≤ 40	≤ 40	≤ 16	≤ 10	≤ 10			

#### inch threads









1/2" NPT

DMK458\_E\_230622

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#### Ordering code DMK 458 **DMK 458** in bar, gauge 9 A 5 9 B in bar, absolute 1 5 in mH₂O, gauge 5 9 C in mH<sub>2</sub>O, absolute <sup>1</sup> 5 9 D consult [mH<sub>2</sub>O] 0.04 4 0 0 0 6 0 0 0.6 0.06 0 0 0 0 10 0.1 1.6 0.16 6 0 0 2.5 0.25 2 5 0 0 0 0 0 0.40 4 40 0 0 0 6 6.0 0.60 10 0 0 1.0 6 0 1 5 0 1 16 16 2 25 25 0 40 4.0 4 0 60 6.0 6 0 0 1 0 0 2 100 10 1 160 16 6 0 2 20 0 0 2 200 customer 9 9 9 9 consult 4 ... 20 mA / 2-wire 1 intrinsic safety 4 ... 20 mA / 2-wire Ε 9 customer consult Accuracy standard: 0.25 % FSO 2 option for $p_N \ge 0.6$ bar: 0.1 % FSO customer 9 consult Electrical connection male and female plug ISO 4400 G 1 0 (for cable Ø 4 ... 6 mm) male and female plug ISO 4400 GL $_{\mathrm{2}}$ G 0 0 (for cable Ø 10 ... 14 mm) male and female plug ISO 4400 GL 2 0 1 G (for cable Ø 4.5 ... 11 mm) male plug M12x1 (4-pin) / 1 0 M metal version cable outlet with TPE-U-cable 3 R 3 T (with ventilation tube) 8 0 9 9 8 field housing stainless steel 1.4404 (316L) consult customer Mechanical connection G 1/2" DIN 3852 1 0 0 G 1/2" EN 837 0 0 2 1/2" NPT N 0 0 G1/2" DIN 3852 open pressure port Н 0 0 2 0 2 2 2 3 flange DN 25 / PN 40 (DIN 2501) flange DN 40 / PN 40 ( DIN 2501) F flange DN 50 / PN 40 (DIN 2501) F flange DN 80 / PN 16 ( DIN 2501) 4 1 4 3 2 3 flange DN 2" / 150 lbs (ANSI B 16.5) 4 F flange DN 3" / 150 lbs (ANSI B 16.5) 4 F customer 9 9 9 consult FKM andere 9 consult stainless steel 1.4404 (316L) 8 copper-nickel-alloy (CuNi10Fe1Mn) 5 Κ customer 9 consult Diaphragm ceramics Al<sub>2</sub>O<sub>3</sub> 96 % 2 ceramics Al<sub>2</sub>O<sub>3</sub> 99.9 % С customer 9 consult Special version standard 0 0 0 customer 9 9 9 consult

01.04.2022

We reserve the right to make modifications to the specifications and materials

the state of engineering at the time of publishing.

specifications given in this document represent

BDISENSORS GmbH - The

<sup>&</sup>lt;sup>1</sup> nominal pressure ranges absolute from 1 bar

<sup>&</sup>lt;sup>2</sup> female plug is GL-approbated

 $<sup>^{\</sup>rm 3}\,$  shielded TPE-U-cable with ventilation tube available in different lengths

<sup>&</sup>lt;sup>4</sup> DN80/PN16 possible for nominal pressure ranges p<sub>N</sub>≤ 16 bar; 2"/150 lbs and 3"/150 lbs possible for nominal pressure ranges p<sub>N</sub>≤ 10 bar

 $<sup>^{5}</sup>$  CuNi10Fe1Mn only in combination with G 1/2" open pressure port (code H00); not possible with field housing (code 880)