

# 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•GL Approval (Det Norske Veritas  
▪ Germanischer Lloyd)
- ▶ ABS-certificate (American Bureau of Shipping)
- ▶ CCS-certificate (China Classification Society)
- ▶ high overpressure resistance
- ▶ excellent long term stability




### Optional versions

- ▶ IS-version  
Ex ia= intrinsically safe for gases
- ▶ diaphragm Al<sub>2</sub>O<sub>3</sub> 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<sub>2</sub>O<sub>3</sub> 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



# DMK 458

Transmitter for Marine and Offshore

Technical Data

<b>Pressure ranges</b>																
Nominal pressure <sup>1</sup>	[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																
<b>Output signal / Supply</b>																
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 9 ... 32 V <sub>DC</sub>								V <sub>S rated</sub> = 24 V <sub>DC</sub>							
Option IS-version	2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>								V <sub>S rated</sub> = 24 V <sub>DC</sub>							
<b>Performance</b>																
Accuracy <sup>2</sup>	standard: ≤ ± 0.25 % FSO								option for P <sub>N</sub> ≥ 0.6 bar <sup>3</sup> : ≤ ± 0.1 % FSO							
Permissible load	R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω															
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															
<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																
<sup>3</sup> Under the influence of disturbance burst according to EN 61000-4-4 (2004) +2 kV accuracy decreases on ≤ ± 0.25 % FSO.																
<b>Thermal effects</b>																
Thermal error	≤ ± 0.1 % FSO / 10 K in compensated range -20 ... 80 °C															
<b>Permissible temperatures</b>																
Permissible temperatures	medium: -40 ... 125°C				electronics / environment: -25 ... 85°C				storage: -40 ... 100°C							
<b>Electrical protection</b>																
Short-circuit protection	permanent															
Reverse polarity protection	no damage, but also no function															
Electromagnetic compatibility	emission and immunity according to - EN 61326 - DNV•GL (Det Norske Veritas • Germanischer Lloyd)															
<b>Mechanical stability</b>																
Vibration	4 g (according to DNV•GL: Class B, curve 2 / basis: IEC 60068-2-6)															
<b>Materials</b>																
Pressure port	standard: stainless steel 1.4404 (316 L) option for threaded connections: CuNi10Fe1Mn - on request															
Housing	stainless steel 1.4404 (316 L)															
Cable sheath for version cable outlet	TPE -U (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil)															
Cable gland for version field housing	absolute, sealed gauge: brass, nickel plated								others on request							
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															
<b>Category of the environment</b>																
Lloyd's Register (LR)	EMV1, EMV2, EMV3 <sup>4</sup> , EMV4								number of certificate: 13/20055							
Det Norske Veritas • Germanischer Lloyd (DNV•GL)	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 458)																
<b>Explosion protection</b>																
Approval DX14A-DMK 458	<b>IBExU 07 ATEX 1180 X</b>															
	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							
Safety technical maximum values	U <sub>i</sub> = 28 V; I <sub>i</sub> = 93 mA; P <sub>i</sub> = 660 mW															
	field housing:								C <sub>i</sub> = 52.3 nF; L <sub>i</sub> = 5 μH; 90.2 nF opposite GND							
	ISO 4400, M12x1, cable outlet:								C <sub>i</sub> = 105 nF; L <sub>i</sub> = 5 μH; 140 nF opposite GND							
Permissible temperatures for environment	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 medium	-40 ... 85 °C															
<b>Miscellaneous</b>																
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 x 10 <sup>6</sup> cycles															
CE conformity	EMC Directive: 2014/30/EU															
ATEX Directive	2014/34/EU															

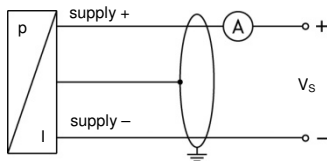
# DMK 458

Transmitter for Marine and Offshore

Technical Data

## Wiring diagram

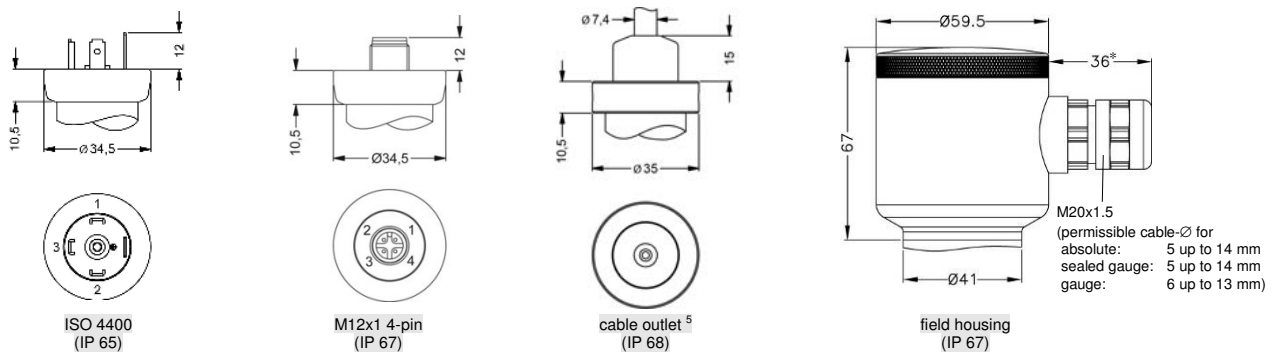
2-wire-system (current)



## Pin configuration

Electrical connections	ISO 4400	field housing (clamp section: 2.5 mm <sup>2</sup> )	M12x1 (4-pin) metal	cable colours (IEC 60757)
Supply +	1	VS+	1	wh (white)
Supply -	2	VS-	2	bn (brown)
Shield	ground contact		4	gnye (green-yellow)

## Electrical connections (dimensions in mm)

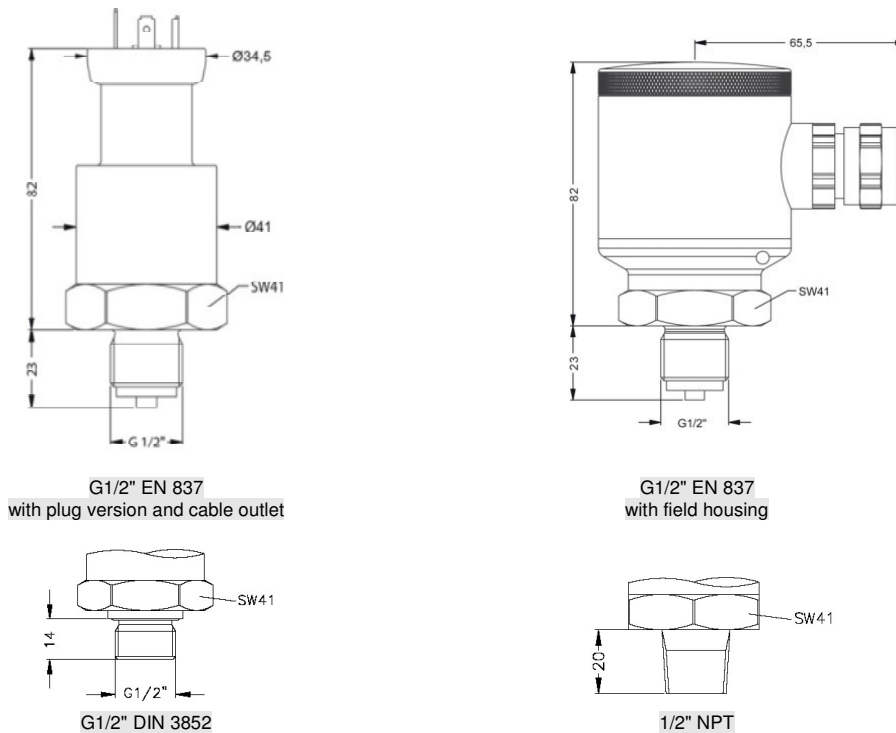


\* for gauge pressure ranges with field housing the marked dimension increases by 8 mm

<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

## Dimensions (in mm)

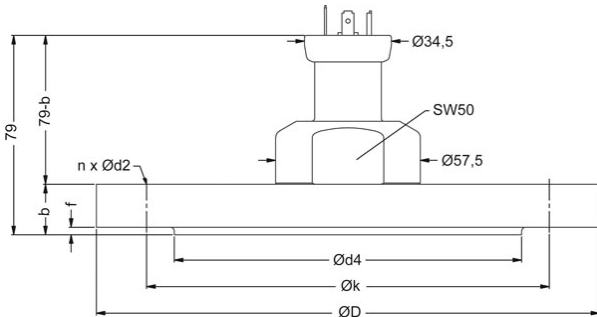
Inch thread



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

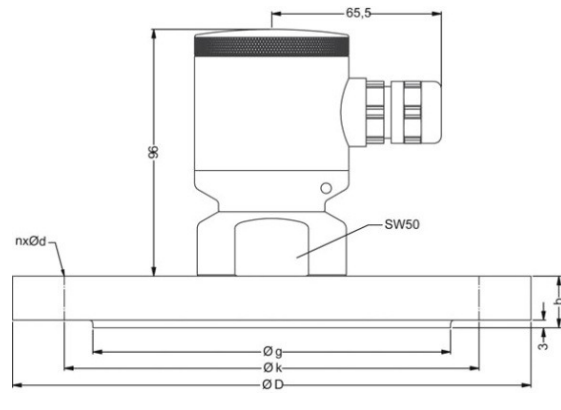
## Dimensions (in mm)

### Flange <sup>6</sup> (DIN 2501)



with plug version and cable outlet

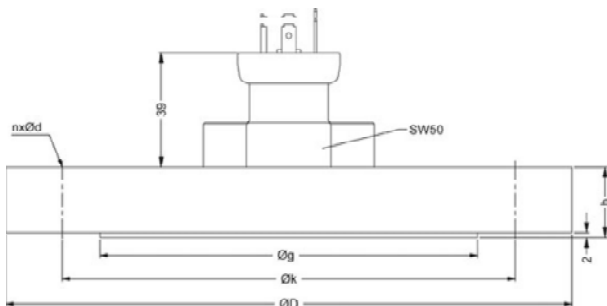
dimensions in mm				
size	DN25/PN40	DN40/PN40	DN50/PN40	DN80/PN16
D	115	150	165	200
k	85	110	125	160
d4	68	88	102	138
b	18	18	20	20
f	2	3	3	3
n	4	4	4	8
d2	14	18	18	18



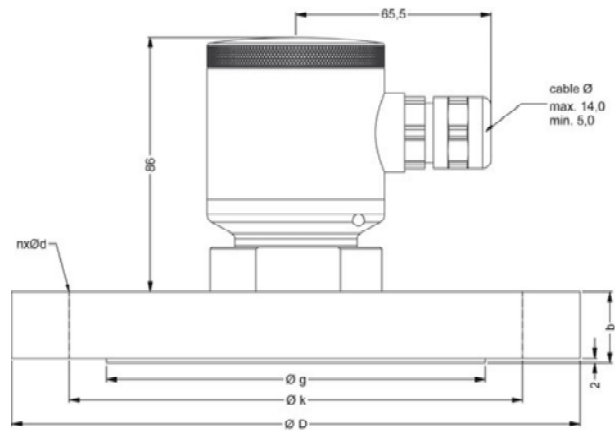
with field housing

dimensions in mm				
size	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 <sup>6</sup> (ANSI)



with plug version and cable outlet



with field housing

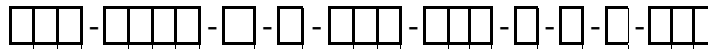
dimensions in mm		
size	2"/150 lbs	3"/150 lbs
D	152.4	190.5
g	91.9	127
k	120.7	152.4
b	19.1	23.9
n	4	4
d	19.1	19.1

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

<sup>6</sup> 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

## Ordering code DMK 458

DMK 458



Pressure															
in bar, gauge		5	9	A											
in bar, absolute <sup>1</sup>		5	9	B											
in mH <sub>2</sub> O, gauge		5	9	C											
in mH <sub>2</sub> O, absolute <sup>1</sup>		5	9	D											consult
Input		[mH <sub>2</sub> O]	[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 <sub>n</sub> > 0.6 bar: 0.1%									1					
	customer									9					consult
Electrical connection															
	Male and female plug ISO 4400 <sup>2</sup> (for cable Ø 4 ... 6 mm)							G	1	0					
	Male and female plug ISO 4400 GL <sup>2</sup> (for cable Ø 10 ... 14 mm)							G	0	0					
	Male and female plug ISO 4400 GL <sup>2</sup> (for cable Ø 4.5 ... 11 mm)							G	0	1					
	Male plug M12x1 (4-pin) / metal version							M	1	0					
	Cable outlet with TPE-U-cable (with ventilation tube)							T	R	3					
	Field housing stainless steel							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					
	G1/2" DIN 3852 open pressure port							H	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) <sup>3</sup>							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) <sup>4</sup>										K				consult
	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%												C		
	customer													9	consult
Special version															
	standard														0 0 0
	customer														9 9 9

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<sup>1</sup> nominal pressure ranges absolute from 1 bar

<sup>2</sup> female plug is GL-approved

<sup>3</sup> DN80/P<sub>N</sub>16 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>4</sup> CuNi10Fe1Mn only possible in combination with inch thread G1/2" open pressure port (cdoe H00)

