

# DMK 457

## Pressure Transmitter for Shipbuilding and Offshore

Ceramic Sensor

accuracy according to IEC 60770:  
0.5 % FSO



### Nominal pressure

from 0 ... 400 mbar up to 0 ... 600 bar

### Output signals

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

### Special characteristics

- ▶ LR-certificate (Lloyd's Register)
- ▶ GL-certificate (Germanischer Lloyd)
- ▶ DVN-certificate (Det Norske Veritas)
- ▶ ABS-certificate (American Bureau of Shipping)
- ▶ CCS-certificate (China Classification Society)
- ▶ pressure port CuNiFe (sea water resistant)
- ▶ oxygen application




### Optional versions

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

The pressure transmitter DMK 457 with ceramic sensor has been designed for typical applications in shipbuilding and offshore constructions as alternative to our pressure transmitter DMP 457 with piezoresistive stainless steel sensor.

In combination with the copper-nickel-alloy the DMK 457 is suitable for seawater, e.g. level measurement in ballast tanks, etc.

### Preferred areas of use are

-  Drives  
Compressors  
Boiler  
Pneumatic Control Systems  
Oxygen Applications
-  Fuel and Oil
-  Water and Sea Water



Input pressure range																			
Nominal pressure gauge	[bar]	-1 ... 0	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600
Nominal pressure abs.	[bar]	-	-	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600
Level gauge / abs.	[mH <sub>2</sub> O]	-	-	6	10	16	25	40	60	100	160	250	400	600	-	-	-	-	-
Overpressure	[bar]	4	1	2	2	4	4	10	10	20	40	40	100	100	200	400	400	600	800
Burst pressure ≥	[bar]	7	2	4	4	5	5	12	12	25	50	50	120	120	250	500	500	650	880
Vacuum resistance		P <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance P <sub>N</sub> < 1 bar: on request																	

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 8 ... 32 V <sub>DC</sub>
Option IS-protection	2-wire: 4 ... 20 mA / V <sub>S</sub> = 10 ... 28 V <sub>DC</sub>

Performance	
Accuracy <sup>1</sup>	IEC 60770: ≤ ± 0.5 % FSO
Permissible load	R <sub>max</sub> = [(V <sub>S</sub> - V <sub>Smin</sub> ) / 0.02 A] Ω
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± 0.3% FSO / year at reference conditions
Response time	< 10 msec

<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Thermal effects (Offset and Span) / Permissible temperatures	
Thermal error	≤ ± 0.2 % FSO / 10 K in compensated range: -25 ... 85 °C
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    - Germanischer Lloyd (GL)    - Det Norske Veritas (DNV)

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

Materials	
Pressure port	Standard: stainless steel 1.4404 (316L) option <sup>2</sup> : CuNi10Fe1Mn (sea water resistant) - for P <sub>N</sub> ≤ 400 bar with mech. connection G1/2" DIN 3852, G1/2" EN 837, G1/2" open port, G1/4" DIN 3852, G1/4" EN 837 in combination with housing in CuNi10Fe1Mn
Housing	standard: stainless steel 1.4404 (316L) option <sup>2</sup> : CuNi10Fe1Mn (sea water resistant) - in combination with pressure port in CuNi10Fe1Mn 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: FFKM (only for P <sub>N</sub> ≤ 100 bar)    others on request
Diaphragm	ceramic Al <sub>2</sub> O <sub>3</sub> 96 %
Media wetted parts	pressure port, seals, diaphragm

<sup>2</sup> IS-version on request

Category of the environment		
Lloyd's Register (LR) <sup>3</sup>	EMV1, EMV2, EMV3, EMV4	number of certificate: 13/20055
Germanischer Lloyd (GL)	D, F <sup>4</sup> , EMC 1	number of certificate: 24 288 - 04 HH
Det Norske Veritas (DNV)	temperature: D    humidity: B electromagnetic compatibility: B	vibration: B number of certificate: A-12144

<sup>3</sup> for P<sub>N</sub> ≤ 160 bar

<sup>4</sup> with material CuNi10Fe1Mn only environmental category „D“

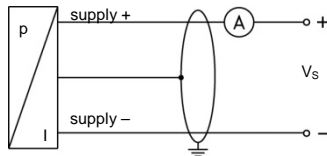
IS-protection	
Approvals DX19-DMK 457	<b>IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X</b> zone 0: for version with field housing and cable outlet: II 1G Ex ia IIB T4 Ga for version with ISO 4400: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, L <sub>i</sub> = 5 μH, with field housing C <sub>i</sub> = 105 nF, with cable outlet C <sub>i</sub> = 84.7 nF, with ISO 4400 C <sub>i</sub> = 62.2 nF, the supply connections have an inner capacity of max. 140 nF to the housing
Ambient temperature range	in zone 0: -20 ... 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar in zone 1 or higher: -20 ... 70 °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: 1 μH/m

Miscellaneous	
Option oxygen application	for $P_N \leq 25$ bar: O-ring in FKM Vi 567 (with BAM-approval); permissible maximum values are 25 bar / 150° C
Current consumption	max. 25 mA
Weight	approx. 140 g (with ISO 4400)
Installation position	any
Operational life	$> 100 \times 10^6$ pressure cycles
CE-conformity	EMC Directive: 2004/108/EC Pressure Equipment Directive: 97/23/EC (module A) <sup>5</sup>
ATEX-directive	94/9/EC

<sup>5</sup> This directive is only valid for devices with maximum permissible overpressure  $> 200$  bar

### Wiring diagram

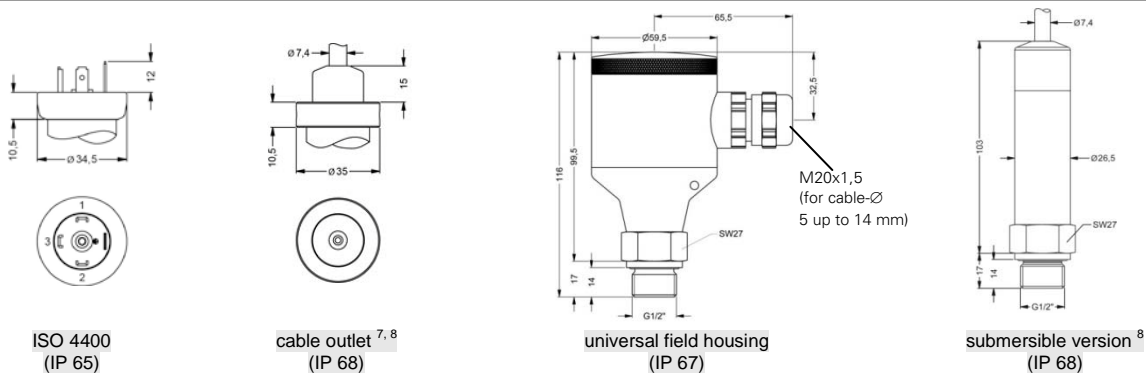
2-wire-system (current)



### Pin configuration

Electrical connection	ISO 4400	Field housing	Cable colours (DIN 47100)
Supply +	1	IN +	wh (white)
Supply -	2	IN -	bn (brown)
Shield	ground pin		ye/gn (yellow / green)

### Electrical connections <sup>6</sup> (dimensions in mm)

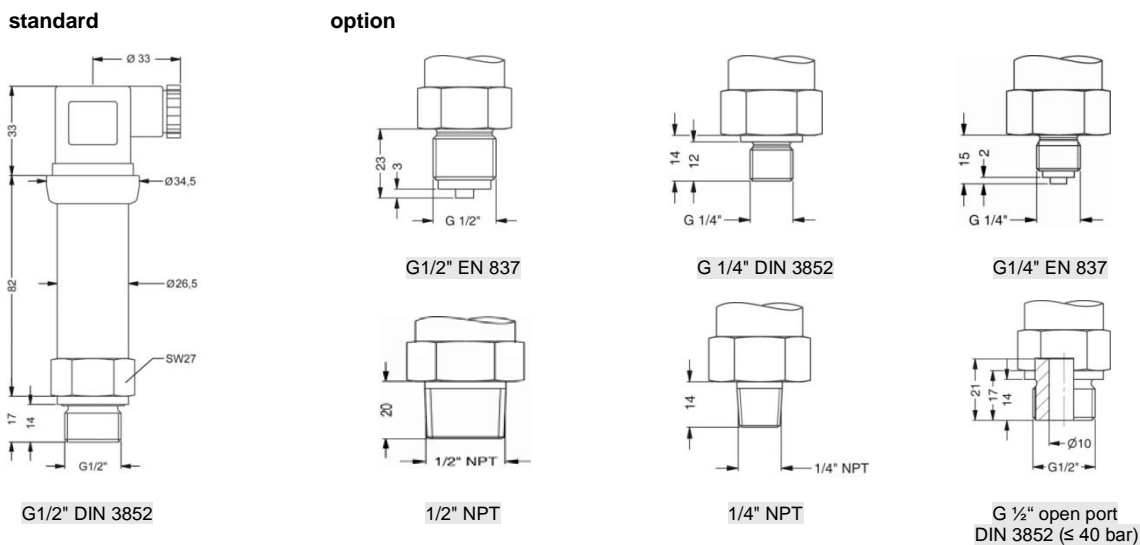


<sup>6</sup> Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.

<sup>7</sup> tested at 4 bar or 40 mH<sub>2</sub>O for 24 hours

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

### Mechanical connection (dimensions in mm)



© 2015 BDISENSORS GmbH – The specifications given in this document represent the state of engineering at the time of publishing. We reserve the right to make modifications to the specifications and materials.

Ordering code DMK 457

DMK 457

□□□ - □□□□ - □ - □ - □□□ - □□□ - □ - □ - □□□

Pressure																					
	in bar, gauge	5	9	0																	
	in bar, absolute	5	9	1																	
	in mH <sub>2</sub> O, gauge	5	9	2																	
	in mH <sub>2</sub> O, absolute	5	9	3																	
Input		[mH <sub>2</sub> O]	[bar]																		
	4	0.4		4	0	0	0														
	6	0.6		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														
	250	25		2	5	0	2														
	400	40		4	0	0	2														
	600	60		6	0	0	2														
	100			1	0	0	3														
	160			1	6	0	3														
	250			2	5	0	3														
	400			4	0	0	3														
	600			6	0	0	3														
	-1 ... 0			X	1	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																					
	0.5 %							5													
	customer							9												consult	
Electrical connection																					
	Male and female plug ISO 4400 (for cable Ø 4...6 mm)									G	1	0									
	Male and female plug ISO 4400 GL <sup>1,2</sup> (for cable Ø 10...14 mm)									G	0	0									
	Male and female plug ISO 4400 GL <sup>1,2</sup> (for cable Ø 4.5...11 mm)									G	0	1									
	Cable outlet (TPE-U-cable) <sup>3</sup>									T	R	3									
	Field housing stainless steel									8	8	0									
	Submersible version (1.4404 / 316L) with TPE-U-cable <sup>3</sup>									T	T	3									
	Submersible version (CuNiFe) with TPE-U-cable <sup>3</sup>									T	S	3									
	customer									9	9	9								consult	
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 open pressure port <sup>4</sup>									H	0	0									
	1/2" NPT									N	0	0									
	1/4" NPT									N	4	0									
	customer									9	9	9								consult	
Seals																					
	FKM												1								
	FFKM <sup>5</sup>												7								
	customer												9							consult	
Pressure port																					
	Stainless steel 1.4404 (316L)													1							
	Copper-Nickel-alloy (CuNi10Fe1Mn) <sup>6</sup>													K							
	customer													9						consult	
Diaphragm																					
	Ceramics Al <sub>2</sub> O <sub>3</sub> 96%														2						
	customer														9					consult	
Special version																					
	standard																		0	0	0
	oxygen application <sup>7</sup>																		0	0	7
	customer																		9	9	9
Prices EXW Thierstein, excluding package																					

<sup>1</sup> Shielded cable has to be used! Cable versions are delivered with shielded cable.  
<sup>2</sup> female plug is GL-approved  
<sup>3</sup> cable with integrated air tube for atmospheric pressure reference; different lengths deliverable  
<sup>4</sup> only for P<sub>N</sub> ≤ 40 bar possible  
<sup>5</sup> only for P<sub>N</sub> ≤ 100 bar possible  
<sup>6</sup> optionally for nominal pressure ranges up to 400 bar and mechanical connections G1/2" DIN 3852, G1/2" EN 837, G1/2" open port, G1/4" DIN 3852, G1/4" EN837 in combination with housing in CuNi10Fe1Mn  
<sup>7</sup> oxygen application with FKM seal possible up to 25 bar

