

# 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)
- ▶ DNV-GL Approval (Det Norske Veritas  
▪ Germanischer Lloyd)
- ▶ 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



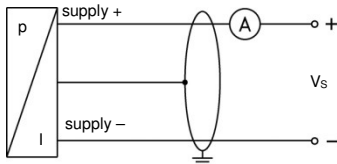
Input pressure range																			
Nominal pressure gauge [bar]	-1 ... 0	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600	
Nominal pressure abs. [bar]	-	-	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600	
Level gauge / abs. [mH <sub>2</sub> O]	-	-	6	10	16	25	40	60	100	160	250	400	600	-	-	-	-	-	
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>S min</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 - DNV•GL (Det Norske Veritas • Germanischer Lloyd)																		
Mechanical stability																			
Vibration	4 g (according to DNV•GL: class B, curve 2 / 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						
Det Norske Veritas • Germanischer Lloyd (DNV•GL)	temperature:							D		number of certificate: TAA00001GR									
	humidity:							B											
	vibration:							B											
	electromagnetic compatibility:							B											
	enclosure:							D											
<sup>3</sup> for P <sub>N</sub> ≤ 160 bar																			
Explosion protection																			
Approvals DX19-DMK 457	<b>IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X</b> zone 0: II 1G Ex ia IIB 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> ≈ 0 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. 90 nF (140 nF with field housing) to the housing																		
Permissible temperatures for environment	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 x 10 <sup>6</sup> pressure cycles
CE-conformity	EMC Directive: 2014/30/EU                      Pressure Equipment Directive: 2014/68/EU (module A) <sup>4</sup>
ATEX-directive	2014/34/EU

<sup>4</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar

### Wiring diagram

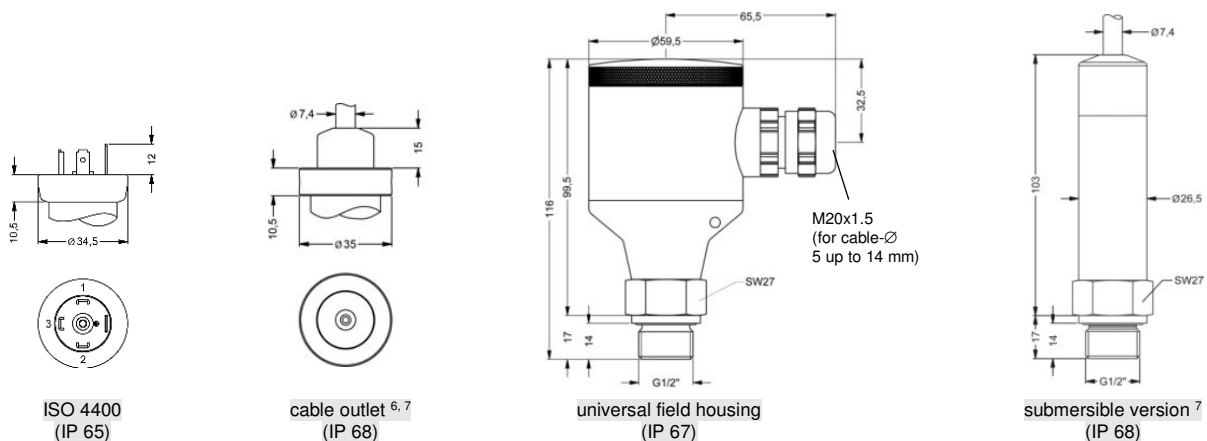
2-wire-system (current)



### Pin configuration

Electrical connection	ISO 4400	Field housing	cable colour (IEC 60757)
Supply +	1	IN +	wh (white)
Supply -	2	IN -	bn (brown)
Shield	ground pin	I	gyne (green-yellow)

### Electrical connections <sup>5</sup> (dimensions in mm)

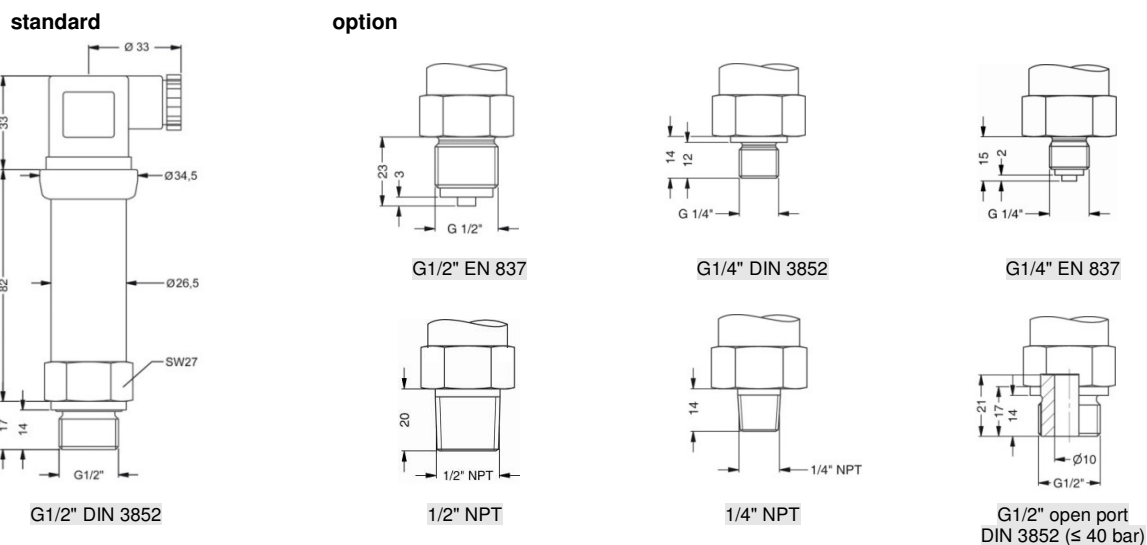


<sup>5</sup> Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.

<sup>6</sup> tested at 4 bar or 40 mH<sub>2</sub>O for 24 hours

<sup>7</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)



## Ordering code DMK 457

DMK 457



<b>Pressure</b>										
	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						
<b>Input</b>										
	[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	
<b>Output</b>										
	4 ... 20 mA / 2-wire						1			
	Intrinsic safety 4 ... 20 mA / 2-wire						E			
	customer						9		consult	
<b>Accuracy</b>										
	0.5 %						5			
	customer						9		consult	
<b>Electrical connection</b>										
	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	
<b>Mechanical connection</b>										
	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	
<b>Seals</b>										
	FKM							1		
	FFKM <sup>5</sup>							7		
	customer							9	consult	
<b>Pressure port</b>										
	Stainless steel 1.4404 (316L)							1		
	Copper-Nickel-alloy (CuNi10Fe1Mn) <sup>6</sup>							K		
	customer							9	consult	
<b>Diaphragm</b>										
	Ceramics Al <sub>2</sub> O <sub>3</sub> 96%							2		
	customer							9	consult	
<b>Special version</b>										
	standard							0	0	0
	oxygen application <sup>7</sup>							0	0	7
	customer							9	9	9

<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

