





Pressure Transmitter for Shipbuilding and Offshore

Ceramic Sensor

accuracy according to IEC 61298-2: 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-approval (Det Norske Veritas)
- **ABS-certificate** (American Bureau of Shipping)
- **CCS-certificate** (China Classification Society)
- pressure port in 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 ₂ 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 _N ≥ 1 k	p _N ≥ 1 bar: unlimited vacuum resistance																
		p _N < 1 bar: on request																	

Output signal / Supply								
Standard	2-wire: 4 20 mA	Δ / V ₀ = 8 32 V ₀						
Option IS-version	2-wire: 4 20 mA / V _S = 8 32 V _{DC} 2-wire: 4 20 mA / V _S = 10 28 V _{DC}							
Performance	Z-WIIG. 4 20 IIIA / VS = 10 20 VDC							
	IFC 61200 2. < 1.0 F	E 0/ FCO						
Accuracy ¹	IEC 61298-2: ≤±0.5 % FSO							
Permissible load	$R_{\text{max}} = [(V_{\text{S}} - V_{\text{S min}}) / 0.02 \text{ A}] \Omega$ supply: 0.05 % FSO / 10 V							
Influence effects	load: 0.05 % FSO							
Long term stability	≤ ± 0.3% FSO / year at reference conditions							
Response time	< 10 msec							
¹ accuracy according to IEC 61298-2 –		linearity hysterasis repeatability)						
Thermal effects (offset and span		internet, hydroredia, repeatability)						
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Thermal error	≤±0.2 % FSO / 10 K							
in compensated range	0 85 °C							
Permissible temperatures	T							
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 (Det Norske Ve	eritas)						
Mechanical stability								
Vibration	4 g (according to DN\	V: class B, curve 2 / basis: IEC 60068-2-6)						
Materials								
Pressure port	standard:	stainless steel 1.4404 (316L)						
	option ² :	CuNi10Fe1Mn (sea water resistant) - for $p_N \le 400$ bar with mechanical						
		connection G1/2" DIN 3852, G1/2" EN 837, G1/2" open port,						
		G1/4" DIN 3852, G1/4" EN 837						
Housing	standard:	 in combination with housing in CuNi10Fe1Mn (not with field housing) - stainless steel 1.4404 (316L) 						
Housing								
	option ² :	CuNi10Fe1Mn (sea water resistant) - in combination with pressure port in CuNi10Fe1Mn -						
	option field housing:	stainless steel 1.4404 (316L); with cable gland (CuNi10Fe1Mn not poss						
Cable sheath								
Cable Sheath	TPF -II	(flame-resistant, halogen free, increased resistance against oil and gasc						
	TPE -U	(flame-resistant, halogen free, increased resistance against oil and gasc resistant against salt, sea water, heavy oil)						
Seals (media wetted)	TPE -U standard:	(flame-resistant, halogen free, increased resistance against oil and gasc resistant against salt, sea water, heavy oil) FKM						
Seals (media wetted)	standard:	resistant against salt, sea water, heavy oil)						
,	standard: option:	resistant against salt, sea water, heavy oil) FKM						
Diaphragm	standard: option: ceramic Al ₂ O ₃ 96 %	resistant against salt, sea water, heavy oil) FKM FFKM (only for $p_N \le 100$ bar) others on reque						
,	standard: option:	resistant against salt, sea water, heavy oil) FKM FFKM (only for $p_N \le 100$ bar) others on reque						
Diaphragm Media wetted parts 2 IS-version on request	standard: option: ceramic Al ₂ O ₃ 96 %	resistant against salt, sea water, heavy oil) FKM FFKM (only for $p_N \le 100$ bar) others on reque						
Diaphragm Media wetted parts 2 IS-version on request Category of the environment	standard: option: ceramic Al ₂ O ₃ 96 % pressure port, seals, o	resistant against salt, sea water, heavy oil) FKM FFKM (only for $p_N \le 100$ bar) others on requediaphragm						
Diaphragm Media wetted parts 2 IS-version on request Category of the environment Lloyd's Register (LR) 3	standard: option: ceramic Al ₂ O ₃ 96 % pressure port, seals, o	resistant against salt, sea water, heavy oil) FKM FFKM (only for $p_N \le 100$ bar) others on requediaphragm diaphragm number of certificate: 13/20055						
Diaphragm Media wetted parts 2 IS-version on request Category of the environment	standard: option: ceramic Al ₂ O ₃ 96 % pressure port, seals, of EMV1, EMV2, EMV3, temperature:	resistant against salt, sea water, heavy oil) FKM FFKM (only for p _N ≤ 100 bar) others on requential diaphragm diaphragm number of certificate: 13/20055 D number of certificate: TAA00001						
Diaphragm Media wetted parts ² IS-version on request Category of the environment Lloyd's Register (LR) ³	standard: option: ceramic Al ₂ O ₃ 96 % pressure port, seals, of EMV1, EMV2, EMV3, temperature: humidity:	resistant against salt, sea water, heavy oil) FKM FFKM (only for p _N ≤ 100 bar) others on requential diaphragm diaphragm number of certificate: 13/20055 D number of certificate: TAA00001 B						
Diaphragm Media wetted parts ² IS-version on request Category of the environment Lloyd's Register (LR) ³	standard: option: ceramic Al ₂ O ₃ 96 % pressure port, seals, of EMV1, EMV2, EMV3, temperature: humidity: vibration:	resistant against salt, sea water, heavy oil) FKM FFKM (only for p _N ≤ 100 bar) others on requential diaphragm diaphragm b, EMV4 number of certificate: 13/20055 D number of certificate: TAA00001 B B B						
Diaphragm Media wetted parts ² IS-version on request Category of the environment Lloyd's Register (LR) ³	standard: option: ceramic Al ₂ O ₃ 96 % pressure port, seals, of EMV1, EMV2, EMV3, temperature: humidity:	resistant against salt, sea water, heavy oil) FKM FFKM (only for p _N ≤ 100 bar) others on requential diaphragm diaphragm b, EMV4 number of certificate: 13/20055 D number of certificate: TAA00001 B B B						

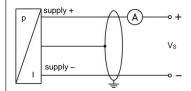


Explosion protection								
<u> </u>	IDE-LLAG ATEN ASSO V. / IEGE-IDE AS SOCTIV							
Approvals	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X							
DX19-DMK 457	zone 0: II 1G Ex ia IIB T4 Ga							
	zone 20: II 1D Ex ia IIIC T135 °C Da							
Safety technical maximum	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, L_i \approx 0 \mu\text{H}$							
values	with field housing: $C_i = 105 \text{ nF}$							
	with cable outlet: $C_i = 84.7 \text{ nF}$							
	with ISO 4400: $C_i = 62.2 \text{ nF}$							
	the supply connections have an inner capacity of max. 90 nF (140 nF with field housing) to the housing							
Permissible temperatures for	in zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar							
environment	in zone 1 or higher: -40/-20 70 °C							
Connecting cables	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m							
(by factory)	cable inductance: signal line/shield also signal line/signal line: 1µH/m							
Miscellaneous								
Option oxygen application	for p _N ≤ 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 million load cycles							
CE-conformity	EMC Directive: 2014/30/EU							
-	Pressure Equipment Directive: 2014/68/EU (module A) ⁴							
ATEX-directive	2014/34/EU							

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

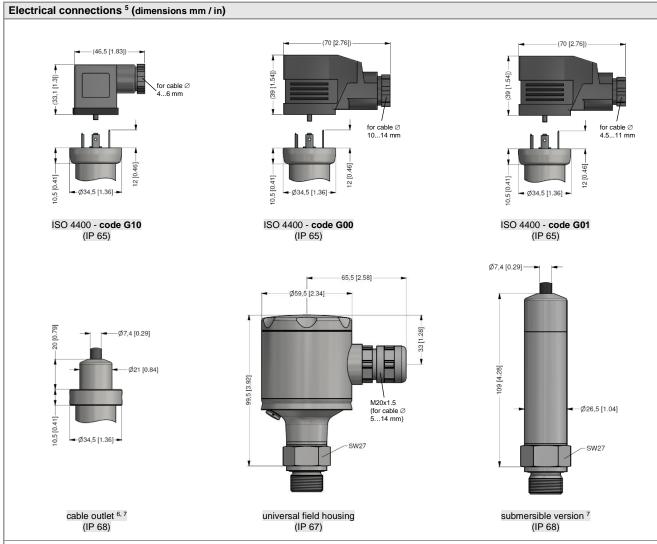
Wiring diagram

2-wire-system (current)

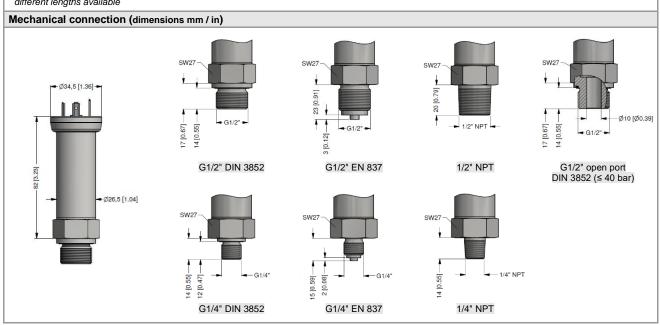


Pin configuration								
Electrical connection	ISO 4400	field housing (clamp section: 2.5 mm²)	cable colours (IEC 60757)					
Supply +	1	VS+	WH (white)					
Supply –	2	VS-	BN (brown)					
Shield	ground pin 🕒	GND	GNYE (green-yellow)					

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- ⁵ Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory. ⁶ tested at 4 bar or 40 mH₂O for 24 hours
- ⁷ shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges absolute, the air tube is closed); different lengths available



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Ordering code DMK 457 **DMK 457** in bar, gauge 9 0 in bar, absolute 9 5 9 2 5 9 3 in mH₂O, gauge in mH₂O, absolute Input [mH₂O] 4 0 0 0 6 0 0 0 1 0 0 1 1 6 0 1 0.4 0.6 6 10 1.0 16 1.6 5 25 0 40 0 6 0 0 1 1 0 0 2 1 6 0 2 2 5 0 2 4 0 0 2 1 0 0 3 1 6 0 3 2 5 0 3 4 0 0 3 2 5 0 3 3 4 0 0 3 3 X 1 0 2 9 9 9 9 60 100 10 160 16 250 25 400 40 600 60 100 160 250 400 600 -1 ... 0 customer consult Output 4 ... 20 mA / 2-wire 1 E intrinsic safety 4 ... 20 mA / 2-wire customer 9 consult Accuracy 0.5 % FSO 5 9 customer consult Electrical connection male and female plug ISO 4400 (for cable Ø 4...6 mm) male and female plug ISO 4400 GL ² (for cable Ø 10...14 mm) 0 G 1 G 0 0 male and female plug ISO 4400 GL 2 0 1 G (for cable Ø 4.5...11 mm) cable outlet with TPE-U-cable 3 R 3 field housing stainless steel 1.4404 (316L) 8 0 submersible version in 1.4404 (316L) Т Т 3 with TPE-U-cable ³ submersible version in CuNiFe s 3 with TPE-U-cable ³ 9 9 9 customer consult Mechanical connection G1/2" DIN 3852 0 0 G1/2" EN 837 G1/4" DIN 3852 0 0 G1/4" EN 837 0 0 G1/2" DIN 3852 open pressure port 4 0 0 1/2" NPT 0 0 1/4" NPT 4 customer 9 consult FKM FFKM ⁵ customer 9 consult stainless steel 1.4404 (316L) 1 copper-nickel-alloy (CuNi10Fe1Mn) 9 consult Diaphragm ceramics Al₂O₃ 96 % 2 customer Special version standard 0 0 0 0 0 7 9 9 9 oxygen application customer consult

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¹ absolute pressure possible from 0.6 bar

² cable socket is GL-approbated

³ shielded TPE-U-cable with ventilation tube available in different lengths

⁴ only for p_N ≤ 40 bar possible

⁵ only for p_N ≤ 100 bar possible

⁶ optionally for nominal pressure ranges up to 400 bar and mechanical connections G1/2" DIN 3852, G1/2" EN 837, G1/2" open pressure port, G1/4" DIN 3852, G1/4" EN837 in combination with housing in CuNi10Fe1Mn (not with field housing)

 $^{^{\}rm 7}$ oxygen application with FKM seal possible up to 25 bar