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)
- 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

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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_2O]	-	-	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	$P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request																	

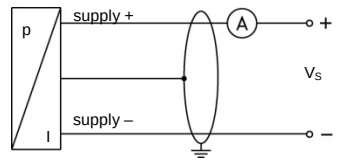
Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 8 ... 32 V_{DC}
Option IS-protection	2-wire: 4 ... 20 mA / V_S = 10 ... 28 V_{DC}
Performance	
Accuracy[1]	IEC 60770: ≤ ± 0.5 % FSO
Permissible load	$R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± 0.3% FSO / year at reference conditions
Response time	< 10 msec
[1] 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 [2]: CuNi10Fe1Mn (sea water resistant) - for $P_N \leq 400$ 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 [2]: 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: NBR, FFKM (only for $P_N \leq 100$ bar) others on request
Diaphragm	ceramic Al_2O_3 96 %
Media wetted parts	pressure port, seals, diaphragm
[2] IS-version on request	
Category of the environment	
Lloyd´s Register (LR)[3]	EMV1, EMV2, EMV3, EMV4 number of certificate: 13/20055
Germanischer Lloyd (GL)	D, F[4], EMC 1 number of certificate: 24 288 - 04 HH
Det Norske Veritas (DNV)	temperature: D humidity: B vibration: B electromagnetic compatibility: B number of certificate: A-12144
[3] for $P_N \leq 160$ bar *[4] with material CuNi10Fe1Mn only environmental category „D“*	
IS-protection	
Approvals DX19-DMK 457	**IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X** 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_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i = 105 nF, L_i = 5 µH, 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_{atm} 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: 1µH/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 10^6 pressure cycles
CE-conformity	EMC Directive: 2004/108/EC Pressure Equipment Directive: 97/23/EC (module A) [5]
ATEX-directive	94/9/EC

[5] *This directive is only valid for devices with maximum permissible overpressure > 200 bar*

Wiring diagram

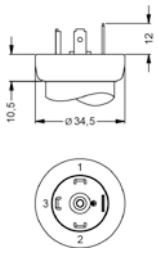
2-wire-system (current)



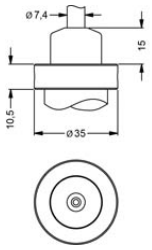
Pin configuration

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

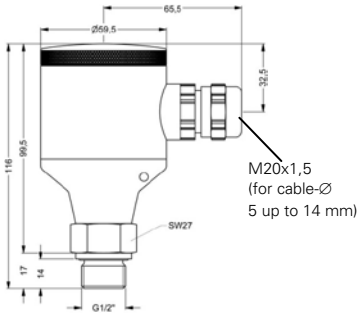
Electrical connections [6] (dimensions in mm)



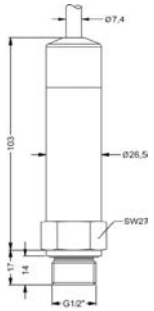
ISO 4400
(IP 65)



cable outlet [7, 8]
(IP 68)



universal field housing
(IP 67)

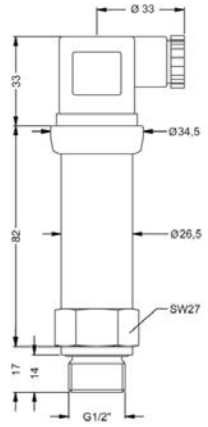


submersible version [8]
(IP 68)

[6] *Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.*
[7] *tested at 4 bar or 40 mH_2O for 24 hours*
[8] *shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges absolute, the air tube is closed); different lengths available*

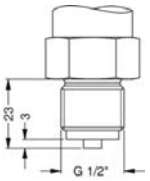
Mechanical connection (dimensions in mm)

standard

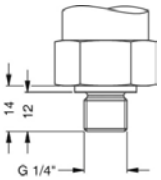


G1/2" DIN 3852

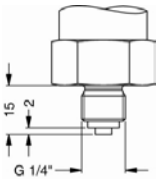
option



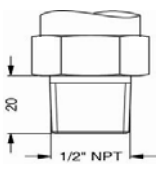
G1/2" EN 837



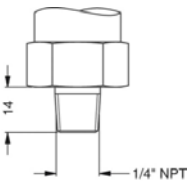
G 1/4" DIN 3852



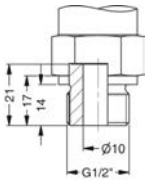
G1/4" EN 837



1/2" NPT



1/4" NPT



G ½" open port
DIN 3852 (≤ 40 bar)

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BD|SENSORS
pressure measurement

Ordering code DMK 457

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Pressure		
in bar, gauge	5 9 0	
in bar, absolute	5 9 1	
in mH_2O, gauge	5 9 2	
in mH_2O, absolute	5 9 3	

Input [mH_2O]	[bar]	Code	
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 [1, 2] (for cable Ø 10...14 mm)	G 0 0	
Male and female plug ISO 4400 GL [1, 2] (for cable Ø 4.5...11 mm)	G 0 1	
Cable outlet (TPE-U-cable) [3]	T R 3	
Field housing stainless steel	8 8 0	
Submersible version (1.4404 / 316L) with TPE-U-cable [3]	T T 3	
Submersible version (CuNiFe) with TPE-U-cable [3]	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 [4]	H 0 0	
1/2" NPT	N 0 0	
1/4" NPT	N 4 0	
customer	9 9 9	consult

Seals			
	FKM	1	
	FFKM [5]	7	
option	NBR [5]	5	
	customer	9	consult

Pressure port		
Stainless steel 1.4404 (316L)	1	
Copper-Nickel-alloy (CuNi10Fe1Mn) [6]	K	
customer	9	consult

Diaphragm		
Ceramics Al_2O_3 96%	2	
customer	9	consult

Special version		
standard	0 0 0	
oxygen application [7]	0 0 7	
customer	9 9 9	consult

[1] Shielded cable has to be used! Cable versions are delivered with shielded cable.
[2] female plug is GL-approbated
[3] cable with integrated air tube for atmospheric pressure reference; different lengths deliverable
[4] only for $P_N \leq 40$ bar possible
[5] only for $P_N \leq 100$ 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 port, G1/4" DIN 3852, G1/4" EN837 in combination with housing in CuNi10Fe1Mn
[7] oxygen application with FKM seal possible up to 25 bar

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