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TEMATEC
Temperature · Technology

DMK 457

Pressure Transmitter for Shipbuilding and Offshore

- ceramic sensor
- accuracy:
  0.25 % FSO BFSL
  (0.50 % FSO IEC 60770)
- nominal pressure ranges
  from 0 ... 0.6 bar
  up to 0 ... 600 bar

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

In order to meet the special requirements for shipbuilding and offshore applications extensive tests had to be passed to get the Germanischer Lloyd (GL) and Det Norske Veritas (DNV) approvals.

With mechanical versions G1/2" open port and G1/2" flush DIN 3852 the DMK 457 is especially suited for viscous, pasty or contaminated media due of the ceramic sensor.

Typical areas of use for shipbuilding/ offshore are:

- gears
- compressors
- boilers
- pneumatic controls
- elevators
- oxygen applications

Characteristics

- small thermal effect
- good long-term stability
- option: oxygen application
- **Option Ex-protection TÜV 03 ATEX 2006 X**
- customer specific versions:
  - special pressure ranges
  - other versions on request

DMK 457
Transmitter for Shipbuilding and Offshore

07. 2008

Input pressure range

Nominal pressure gauge	[bar]	-1...0	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	-	-	-	-	-
Permissible overpressure	[bar]	3	3	3	7	7	12	12	25	50	50	120	120	250	500	500	600	750

Output signal / Supply

Standard	2-wire: 4 ... 20 mA / V_S = 12 ... 36 V_{DC} (rated: 24 V_{DC})	Ex-protection: V_S = 14 ... 28 V_{DC}

Performance

Accuracy	IEC 60770 [1]: ≤ ± 0.5 % FSO	BFSL: ≤ ± 0.25 % FSO
Permissible load	$R_{max} = [(V_S - V_{S\,min}) / 0.02]\ \Omega$	
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ	
Response time	< 10 msec.	

Thermal effects

Thermal error for offset and span	≤ ± 0.2 % FSO / 10 K
in compensated range	-25 ... 85 °C

Electrical protection

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)
Option Ex-protection DX13-DMK 457	zone 0 [2]: II 1 G EEx ia IIC T4 zone 20: II 1 D T 85°C safety technical maximum values: V_i = 28 V, I_i = 93 mA, P_i = 660 mW, $C_i \leq$ 1nF, $L_i \leq$ 10 µH

Mechanical stability

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

Permissible temperatures

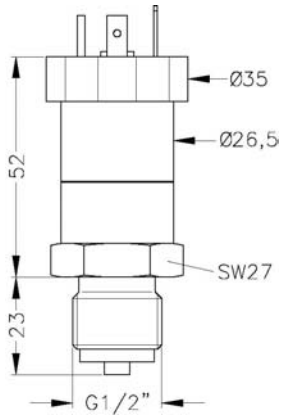
Medium	-25 ... 135 °C		
Electronics / environment	-25 ... 80 °C	Ex-protection:	application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C
Storage	-40 ... 100 °C		

[1] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

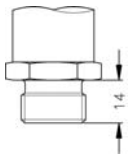
[2] approved for atmospheric pressure from 0.8 bar up to 1.1 bar

Mechanical connection (dimensions in mm)

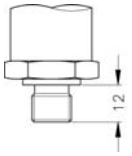
Standard **Options**



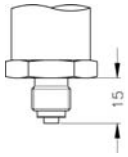
G1/2“ EN 837
M20x1.5



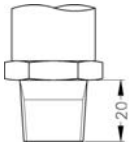
G1/2“ DIN 3852
M20x1.5



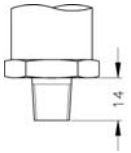
G1/4“ DIN 3852
M10x1; M12x1; M12x1.5
(up to 100 bar)



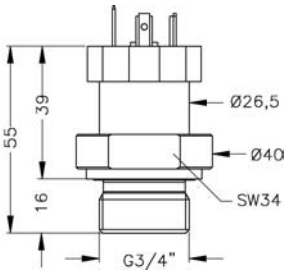
G1/4“ EN 837



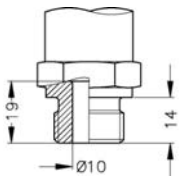
1/2“ NPT



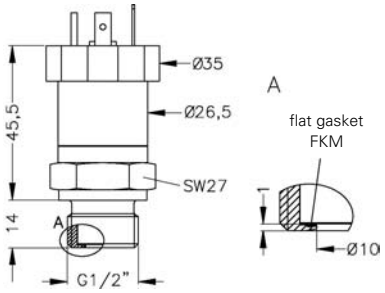
1/4“ NPT



G3/4“ DIN 3852
(up to 60 bar)



G1/2“ DIN 3852
open port

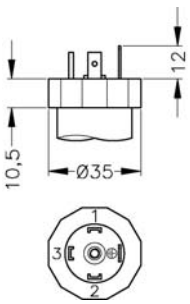


G1/2“ DIN 3852 semi-flush
(up to 25 bar; nominal
pressure abs. on request)

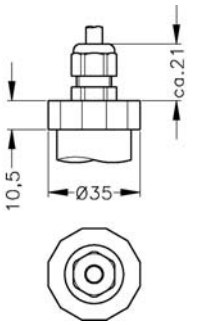
⇨ With Ex-protection total length increases by 32.5 mm (with G3/4" by 36 mm; with field housing by 8 mm)!

Electrical connection [3] (dimensions in mm)

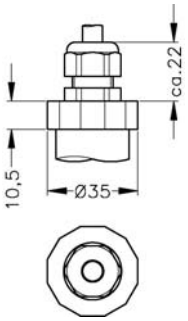
Standard **Optional**



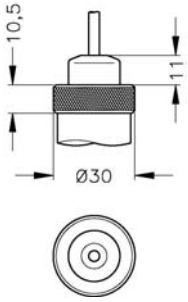
ISO 4400
(IP 65)



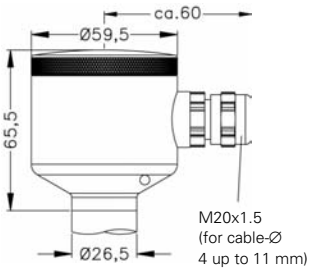
Cable gland
cable without air tube
(IP 67)



Cable gland
cable with air tube
(IP 67)



Cable outlet
cable with or without
air tube [4] (IP 68)



Field housing
(IP 67)

[3] Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.

[4] tested at 4 bar or 40 mH_2O for 24 hours

Materials

Pressure port	standard: stainless steel 1.4571 (316Ti) option [5]: CuNi10Fe1Mn (sea water resistant) - for $P_N \leq 400$ bar with mech. connection G1/2" DIN 3852, G1/2" EN 837, 1/2" NPT in combination with housing in CuNi10Fe1Mn
Housing	standard: stainless steel 1.4301 (304) option [5]: CuNi10Fe1Mn (sea water resistant) - in combination with pressure port in CuNi10Fe1Mn option field housing: stainless steel 1.4404 (316L); with cable gland
Seals (media wetted)	$P_N < 100$ bar: FKM $P_N \geq 100$ bar: NBR others on request
Diaphragm	ceramics Al_2O_3 96 %
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

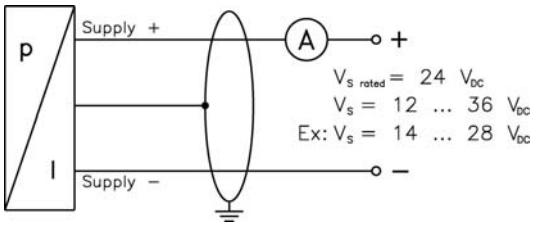
Optionally SIL 2 application	according to IEC 61508 / IEC 61511
Optionally oxygen application	for $P_N \leq 50$ bar: O-ring in V747-75 (with BAM-approval); permissible maximum values are 40 bar / 130° C and 50 bar / 100° C for $P_N > 50$ bar: O-ring in FKM 90 (approved by the scientific coal research institute in Ostrava – CZ) up to max. 215 bar / 95 °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: 1.0 µH/m
Current consumption	max. 25 mA
Weight	approx. 140 g
Installation position	any
Operational life	> 100 x 10^6 cycles

Pin configuration

Electrical connection		ISO 4400	cable colours (DIN 47100)
2-wire-system	Supply +	1	white
	Supply –	2	brown
	Ground	Ground pin	yellow / green (shield)

Wiring diagram

2-wire-system (current)



[5] Ex-protection on request

Ordering code DMK 457

DMK 457 □□□-□□□□-□-□-□□□-□□□-□-□-□-□□□

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]		
6	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	
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	on request
Output			
4 ... 20 mA / 2-wire		1	
Intrinsic safety 4 ... 20 mA / 2-wire		E	
SIL2 4 ... 20 mA / 2-wire		1S	
SIL2 with Intrinsic safety 4 ... 20 mA / 2-wire		ES	
customer		9	on request
Accuracy			
0,5 %		5	
customer		9	on request
Electrical connection			
Male and female plug ISO 4400 (for cable ∅ 4...6 mm)	[1]	G 1 0	
Male and female plug ISO 4400 GL (for cable ∅ 10...14 mm)	[1, 2]	G 0 0	
Male and female plug ISO 4400 GL (for cable ∅ 4,5...11 mm)	[1, 2]	G 0 1	
Cable gland incl. cable	[1, 3, 4]	4 0 0	
Cable outlet incl. cable	[1, 3]	T R 0	
Field housing stainless steel		8 8 0	
customer		9 9 9	on request
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	
G3/4" DIN 3852	[5]	K 0 0	
G1/2" DIN 3852 with flush sensor	[6]	F 0 0	
G1/2" DIN 3852 open pressure port		H 0 0	
1/2" NPT		N 0 0	
1/4" NPT		N 4 0	
customer		9 9 9	on request
Seals			
for P_N < 100 bar	FKM	1	
for P_N ≥ 100 bar	NBR	5	
	customer	9	on request
Pressure port			
Stainless steel 1.4571 (316Ti)		1	
Copper-Nickel-alloy (CuNi10Fe1Mn)	[7]	K	
customer		9	on request
Diaphragm			
Ceramics Al_2O_3 96%		2	
customer		9	on request
Special version			
standard		0 0 0	
oxygen application	[8]	0 0 7	
customer		9 9 9	on request

[1] Shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.
[2] female plug is GL-approbated
[3] different cable types and lengths deliverable
[4] standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube
[5] G3/4" DIN 3852 possible up to 60 bar
[6] G1/2" semi-flush DIN 3852 possible up to 25 bar; nominal pressure abs. on request
[7] optionally for nominal pressure ranges up to 400 bar and mechanical connections G1/2" DIN 3852, G1/2" EN 837, 1/2" NPT, other versions an Ex-protection on request
[8] oxygen application possible up to 160 bar

This ordering code contains product specification; properties are not guaranteed. Subject to change without notice.