DMK 456

Pressure Transmitter with Stainless Steel Field Housing

Special application:
Marine and Offshore

accuracy according to IEC 61298-2:
standard: 0.25 % FSO
option: 0.1 % FSO

Nominal pressure

from 0 ... 40 mbar up to 0 ... 20 bar

Output signals

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

Product characteristics

- LR-certificate (Lloyd´s Register)
- DNV-approval (Det Norske Veritas)
- ABS-certificate
  (American Bureau of Shipping)
- CCS-certificate
  (China Classification Society)
- diaphragm ceramics Al_2O_3 99.9 %
- stainless steel field housing
- IS-version (temperature class T6)
  Ex ia = intrinsically safe for gases
- high overpressure resistance

Optional versions

- different inch threads and
  flush versions

The pressure transmitter DMK 456 has been developed for measuring the pressure in systems and the level in tanks and is certificated for shipbuilding and offshore applications.

Due robust stainless steel field housing and the possibility to use the device in intrinsic safe areas (temperature class T6) enable to measure the pressure of aggressive gases and fluids under extreme operating conditions. The basis for the DMK 456 is a capacitive ceramic sensor element designed by BD|SENSORS, which offers a high overload resistance and medium compatibility.

Preferred areas of use are

Monitoring of the pressure during loading and unloading processes

Monitoring of a ship's position and draught

Use in anti-heeling systems

Level measurement in ballast and storage tanks

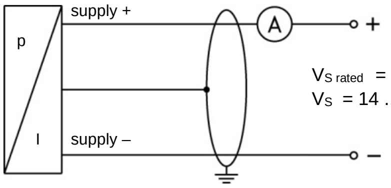
Monitoring of the internal pressure in liquid gas cargo tanks

Pressure ranges																
Nominal pressure [1]	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH_2O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Permissible overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]	-0.2		-0.3		-0.5			-1							
[1] available in gauge and absolute; nominal pressure ranges absolute from 1 bar																

Output signal / Supply			
Standard	IS-version 4 ... 20 mA / 2-wire	V_S = 14 ... 28 V_{DC}	$V_{S\,rated}$ = 24 V_{DC}
Performance			
Accuracy [2]	standard:	≤ ± 0.25 % FSO	
	option for $P_N \geq 0.6$ bar [3]:	≤ ± 0.1 % FSO	
Permissible load	$R_{max} = [(V_S - V_{S\,min}) / 0.02\,A]\,\Omega$		
Long term stability	≤ ± 0.1 % FSO / year at reference conditions		
Influence effects	supply: 0.05 % FSO / 10 V	load: 0.05 % FSO / kΩ	
Turn-on time	700 msec		
Mean response time	< 200 msec	mean measuring rate 5/sec	
Max. response time	380 msec		
[2] accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)			
[3] under the influence of disturbance burst according to EN 61000-4-4 (2004) +2 kV accuracy decreased to ≤ ± 0.25 % FSO			
Thermal effects (offset and span)			
Tolerance band	≤ ± 1 % FSO		
In compensated range	-20 … 80 °C		
Permissible temperatures			
Medium	-25 … 125 °C		
Electronics / environment	-25 … 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 Veritas)		
Mechanical stability			
Vibration	4 g (according to DNV: class B, curve 2 / basis: IEC 60068-2-6)		
Materials			
Pressure port	stainless steel 1.4404 (316 L)		
Housing	stainless steel 1.4404 (316 L)		
Cable gland	brass, nickel plated	others on request	
Seals	FKM	others on request	
Diaphragm	ceramics Al_2O_3 99.9 %		
Media wetted parts	pressure port, seals, diaphragm		
Category of the environment			
Lloyd´s Register (LR)	EMV1, EMV2, EMV4		number of certificate: 13/20055
Det Norske Veritas (DNV)	temperature:	D	number of certificate: TAA00001GR
	humidity:	B	
	vibration:	B	
	electromagnetic compatibility:	B	
	enclosure:	D	
Explosion protection			
Approval DX14A-DMK 456	IBExU07ATEX1180 X zone 0: II 1G Ex ia IIC T6 Ga		
Safety techn. maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i = 52.3 nF, L_i = 0 µH, the supply connections have an inner capacity of max. 90.2 nF opposite the enclosure		
Permissible temperatures for environment	-20 ... 60 °C		
Miscellaneous			
Ingress protection	IP 67		
Installation position	any		
Current consumption	max. 21 mA		
Weight	min. 400 g (depending on housing and mechanical connection)		
Operational life	100 million load cycles		
CE conformity	EMC Directive: 2014/30/EU		
ATEX Directive	2014/34/EU		

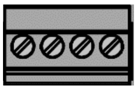
Wiring diagram

2-wire-system (current)



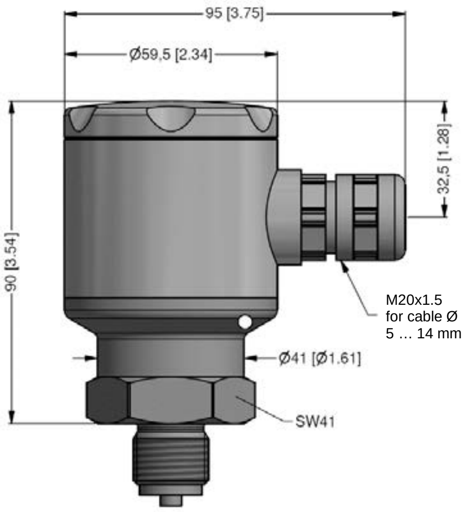
$V_{S\ rated}$ = 24 V_{DC}
V_S = 14 ... 28 V_{DC}

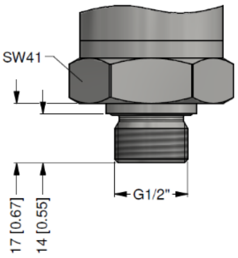
Pin configuration

Electrical connections	field housing (clamp section: 2.5 mm^2) 
Supply + Supply –	VS+ VS-
Ground	GND

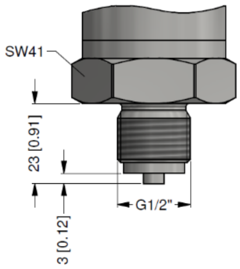
Dimensions (mm / in)

inch thread

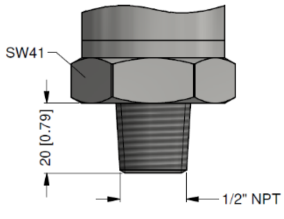




G1/2" 3852

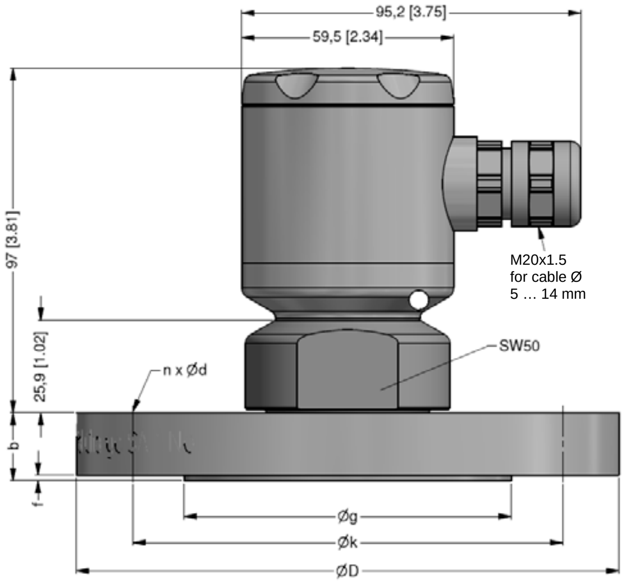


G1/2" EN 837



1/2" NPT

flange



dimensions in mm					
	DIN 2501			ANSI	
size	DN25/PN40	DN50/PN40	DN80/PN16	2"/150 lbs	3"/150 lbs
b	18	20	20	19.1	23.9
d	14	18	18	19.1	19.1
D	115	165	200	152.4	190.5
f	2	3	3	2	2
g	68	102	138	91.9	127
k	85	125	160	120.7	152.4
n	4	4	8	4	4
p_N [bar]	≤ 40	≤ 40	≤ 16	≤ 10	≤ 10

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Ordering code DMK 456

DMK 456			☐☐☐	☐☐☐☐	☐	☐	☐☐☐	☐☐☐	☐	☐	☐	☐☐☐	
Pressure													
in bar, gauge			595										
in bar, absolute [1]			596										consult
in mH$_2$O, gauge			597										
in mH$_2$O, absolute [1]			598										consult
Input	[mH$_2$O]	[bar]											
	0.4	0.04		0400									
	0.6	0.06		0600									
	1.0	0.10		1000									
	1.6	0.16		1600									
	2.5	0.25		2500									
	4.0	0.40		4000									
	6.0	0.60		6000									
	10	1.0		1001									
	16	1.6		1601									
	25	2.5		2501									
	40	4.0		4001									
	60	6.0		6001									
	100	10		1002									
	160	16		1602									
	200	20		2002									
		customer		9999									consult
Output													
intrinsic safety 4 … 20 mA / 2-wire					E								
customer					9								consult
Accuracy													
standard		0.25 % FSO				2							
option for $p_N \geq 0.6$ bar:		0.10 % FSO				1							
customer						9							consult
Electrical connection													
field housing stainless steel 1.4404 (316L)							880						
customer							999						consult
Mechanical connection													
G1/2" DIN 3852								100					
G1/2" EN 837								200					
1/2" NPT								N00					
flange DN 25 / PN 40 (DIN 2501)								F20					
flange DN 50 / PN 40 (DIN 2501)								F23					
flange DN 80 / PN 16 (DIN 2501) [2]								F14					
flange DN 2" / 150 lbs (ANSI B16.5) [2]								F32					
flange DN 3" / 150 lbs (ANSI B16.5) [2]								F33					
customer								999					consult
Seal													
FKM									1				
customer									9				consult
Pressure port													
stainless steel 1.4404 (316L)										1			
customer										9			consult
Diaphragm													
ceramics Al$_2$O$_3$ 99.9 %											C		
customer											9		consult
Special version													
standard												000	
customer												999	consult

[1] nominal pressure ranges absolute from 1 bar

[2] DN80/PN16 possible for nominal pressure ranges $p_N \leq 16$ bar; 2"/150 lbs and 3"/150 lbs possible for nominal pressure ranges $p_N \leq 10$ bar

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16.12.2024