

DMK 456

Pressure Transmitter with Stainless Steel Field Housing

Special application:
Marine and Offshore

accuracy according to IEC 60770:
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-GL Approval (Det Norske Veritas ▪ Germanischer Lloyd)
- ▶ ABS-certificate (American Bureau of Shipping)
- ▶ CCS-certificate (China Classification Society)
- ▶ stainless steel field housing
- ▶ IS-version (temperature class T6)
Ex ia = intrinsically safe for gases
- ▶ high overpressure resistance






Optional versions

- ▶ diaphragm Al₂O₃ 99.9 %
- ▶ 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



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Technical Data

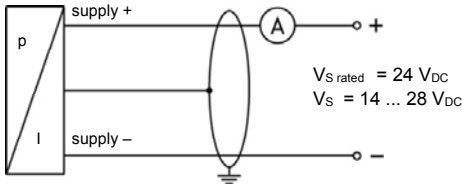
Pressure ranges																
Nominal pressure ¹	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH ₂ O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Permissible overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]	-0.2		-0.3		-0.5			-1							

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 ≥ 0.6 bar ³ : ≤ ± 0.1 % FSO
Permissible load	R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω
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 60770 – 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 / Permissible temperatures	
Thermal error	≤ ± 0.1 % FSO / 10 K 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•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	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	standard: ceramics Al ₂ O ₃ 96 % option: ceramics Al ₂ O 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 • Germanischer Lloyd (DNV•GL)	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

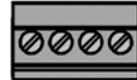
2-wire-system (current)



Pin configuration

Electrical connections

field housing (clamp section: 2.5 mm²)



V_{S+} V_{S-} S+ GND

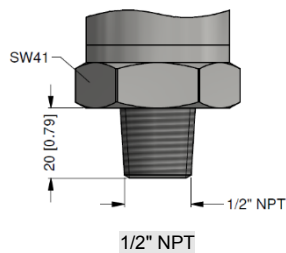
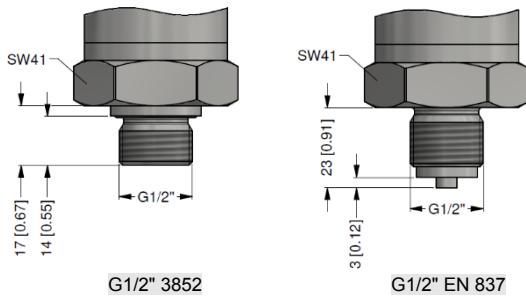
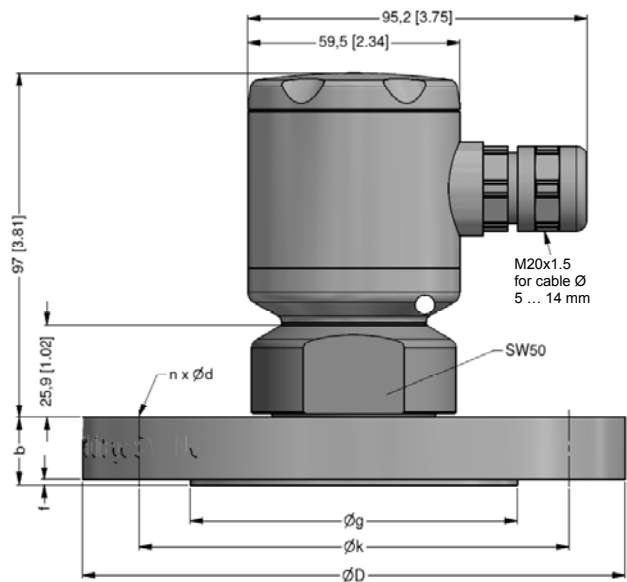
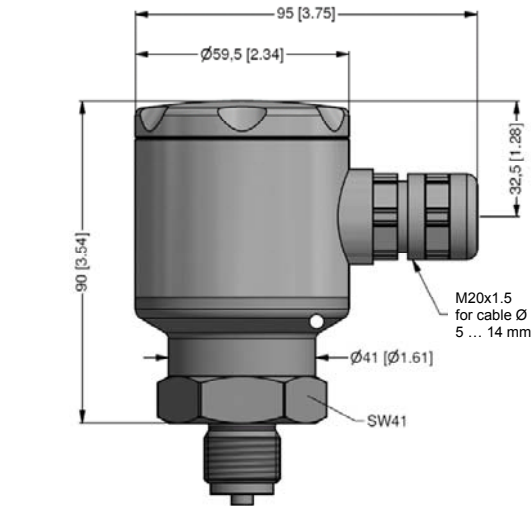
Supply +
Supply -
Ground

VS+
VS-
GND

Dimensions (mm / in)

inch thread

flange

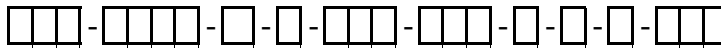


size	DIN 2501			ANSI	
	DN25/PN40	DN50/PN40	DN80/PN16	2"/150 lbs	3"/150 lbs
b	18	20	20	19.1	23.9
d	14	18	18	19.1	19.1
D	115	165	200	152.4	190.5
f	2	3	3	2	2
g	68	102	138	91.9	127
k	85	125	160	120.7	152.4
n	4	4	8	4	4
p _N [bar]	≤ 40	≤ 40	≤ 16	≤ 10	≤ 10

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Ordering code DMK 456

DMK 456



Pressure										
	in bar, gauge	5	9	5						
	in bar, absolute ¹	5	9	6						consult
	in mH ₂ O, gauge	5	9	7						
	in mH ₂ O, absolute ¹	5	9	8						consult
Input										
	[mH ₂ O]	[bar]								
	0.4	0.04		0	4	0	0			
	0.6	0.06		0	6	0	0			
	1.0	0.10		1	0	0	0			
	1.6	0.16		1	6	0	0			
	2.5	0.25		2	5	0	0			
	4.0	0.40		4	0	0	0			
	6.0	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			
	200	20		2	0	0	2			
	customer			9	9	9	9			consult
Output										
	intrinsic safety 4 ... 20 mA / 2-wire							E		
	customer							9		consult
Accuracy										
	standard	0.25 % FSO						2		
	option for p _N ≥ 0.6 bar:	0.10 % FSO						1		
	customer							9		consult
Electrical connection										
	field housing stainless steel 1.4404 (316L)							8	8	0
	customer							9	9	9
Mechanical connection										
	G1/2" DIN 3852							1	0	0
	G1/2" EN 837							2	0	0
	1/2" NPT							N	0	0
	flange DN 25 / PN 40 (DIN 2501)							F	2	0
	flange DN 50 / PN 40 (DIN 2501)							F	2	3
	flange DN 80 / PN 16 (DIN 2501) ²							F	1	4
	flange DN 2" / 150 lbs (ANSI B16.5) ²							F	3	2
	flange DN 3" / 150 lbs (ANSI B16.5) ²							F	3	3
	customer							9	9	9
Seals										
	FKM							1		
	customer							9		consult
Pressure port										
	stainless steel 1.4404 (316L)							1		
	customer							9		consult
Diaphragm										
	ceramics Al ₂ O ₃ 96 %							2		
	ceramics Al ₂ O ₃ 99,9 %							C		
	customer							9		consult
Special version										
	standard							0	0	0
	customer							9	9	9

¹ nominal pressure ranges absolute from 1 bar

² DN80/PN16 possible for nominal pressure ranges p_N ≤ 16 bar; 2"/150 lbs and 3"/150 lbs possible for nominal pressure ranges p_N ≤ 10 bar