

LMK 458



Probe For Marine And Offshore

Ceramic Sensor

accuracy according to IEC 60770:
standard: 0.25 % FSO
option: 0.1 % FSO

Nominal pressure

from 0 ... 40 cmH₂O up to 0 ... 200 mH₂O

Output signals

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

Special characteristics

- ▶ diameter 39.5 mm
- ▶ LR-certificate (Lloyd's Register)
- ▶ DNV-GL Approval (Det Norske Veritas
▪ Germanischer Lloyd)
- ▶ ABS-certificate (American Bureau of Ship-
ping)
- ▶ CCS-certificate
(China Classification Society)
- ▶ high overpressure resistance
- ▶ high long-term stability

Optional versions

- ▶ diaphragm Al₂O₃ 99.9 %
- ▶ different housing materials (stainless steel,
CuNiFe)
- ▶ IS-version Ex ia = intrinsically safe for gas
- ▶ screw-in and flange version
- ▶ accessories e.g. assembling and probe
flange, mounting clamp

The hydrostatic probe LMK 458 has been devel-
oped for measuring level in service and storage
tanks and is as a consequence certificated for
shipbuilding and offshore applications.

A permissible operating temperature of up to
125°C and the possibility to use the device in
intrinsic safe areas enable to measure the pres-
sure of various fluids under extreme conditions.
The basis for the LMK 458 is a capacitive ceramic
sensor element designed by BD SENSORS,
which offers a high overload resistance and me-
dium compatibility.

Preferred areas of use are



Water

drinking water abstraction
desalinization plant

Shipbuilding / Offshore

ballast tanks



monitoring of a ship's position
and draught

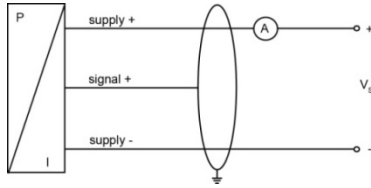
level measurement in ballast and sto-
rage tanks



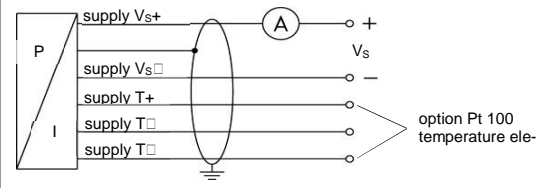
Pressure ranges																
Nominal pressure ¹	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH ₂ O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]	-0.2		-0.3		-0.5				-1						
¹ available in gauge, sealed gauge and absolute; nominal pressure ranges sealed gauge and absolute from 1 bar																
Output signal / Supply																
Standard	2-wire: 4 ... 20 mA / V _S = 9 ... 32 V _{DC}								V _S rated = 24 V _{DC}							
Option IS-version	2-wire: 4 ... 20 mA / 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							
Influence effects	supply: 0.05 % FSO / 10 V								permissible 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 / electronics / environment / storage: -25 ... 125 °C (depends on cable sheath / seals)															
Electrical protection ⁴																
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)															
⁴ additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available																
Mechanical stability																
Vibration	4 g (according to DNV•GL: class B, curve 2 / basis: DIN EN 60068-2-6)															
Cable with sheath material	TPE-U blue Ø 7.4 mm															
Bending radius	static installation: 10-fold cable diameter dynamic application: 20-fold cable diameter															
<i>(shielded cable with integrated ventilation tube for atmospheric pressure reference (for nominal pressure ranges absolute, the ventilation tube is closed)</i>																
Electrical connection																
Cable outlet	shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges sealed gauge and absolute, the air tube is plugged)															
Materials																
Housing	standard: stainless steel 1.4404 (316L) option: CuNi10Fe1Mn (resistant against sea water) others on request															
Seals (media wetted)	standard: FKM options: EPDM, FFKM (min. permissible temperature from -15 °C) others on request															
Diaphragm	standard: ceramics Al ₂ O ₃ 96 % option: ceramics Al ₂ O ₃ 99.9 %															
Protection cap	POM-C															
Cable sheath	TPE -U (-25 ... 125 °C) (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil)															
Miscellaneous																
Option cable protection for probes in stainless steel	prepared for mounting with stainless steel pipe; available as compact product (standard: stainless steel pipe with a total length up to 2 m possible; other lengths on request)															
Ingress protection	IP 68															
Current consumption	max. 21 mA															
Weight	min. 650 g (without cable)															
CE-conformity	EMC Directive: 2014/30/EU															
ATEX Directive	2014/34/EU															
Option Pt 100 temperature element ⁵ (not possible with IS-version)																
Temperature range	-25 ... 125 °C															
Connection temperature element	3-wire															
Resistance	100 Ω at 0 °C															
Temperature coefficient	3850 ppm/K															
Supply I _s	0.3 ... 1.0 mA _{DC}															
Category of the environment																
Lloyd's Register (LR)	EMV1, EMV2, EMV3, EMV4								number of certificate: 13/20055							
Det Norske Veritas • Germanischer Lloyd (DNV•GL)	temperature: D humidity: B electromagnetic compatibility: B								vibration: B number of certificate: TA00001GM							
IS-protection (not possible with Pt1000 temperature element)																
Approval DX4A-LMK 458	IBExU 07 ATEX 1180 X								zone 0 ⁶ : II 1G Ex ia IIB T4							
Safety technical maximum values	U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C _i = 105 nF; L _i = 0 µH; the supply connections have an inner capacity of max. 140 nF opposite the enclosure															
Permissible temp. for environment	in zone 0 ⁶ : -20 ... 60 °C with p _{atm} 0.8 bar up to 1.1 bar								zone 1 and higher: -25 ... 70 °C							
Connecting cables (by factory)	cable capacity:				signal line/shield as well as signal line/signal line: 160 pF/m											
	cable inductance:				signal line/shield as well as signal line/signal line: 1 µH/m											
⁵ only for 4...20mA, cable length max. 5m																
⁶ for optional stainless steel pipe the following designation is valid: "II 1 G Ex ia IIC T4" (zone 0)																

Wiring diagrams

2-wire-system (current)



2-wire-system (current) with Pt 100



Pin configuration

Electrical connection

cable colours (DIN 47100)

Supply V_{S+}
Supply V_{S-}
Option Pt 100 temperature element:
Supply T+ (with Pt 100)
Supply T- (with Pt 100)
Supply T- (with Pt 100)

wh (white)
bn (brown)

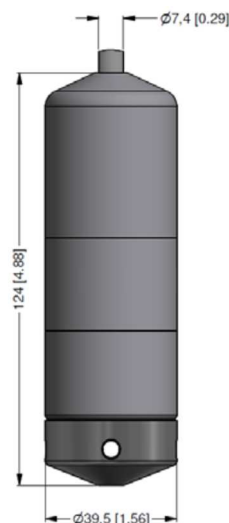
ye (yellow)
gy (grey)
pk (pink)

Shield

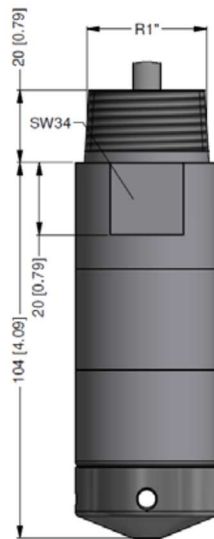
gn/ye (green / yellow)

Dimensions for housing in stainless steel and CuNiFe (mm / in)

probe versions

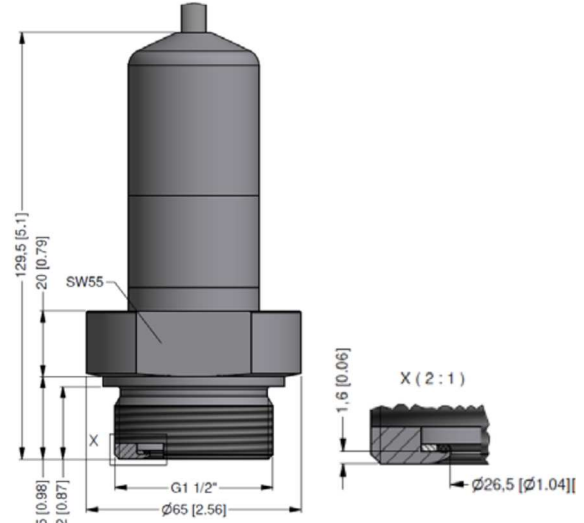


Screw-in version



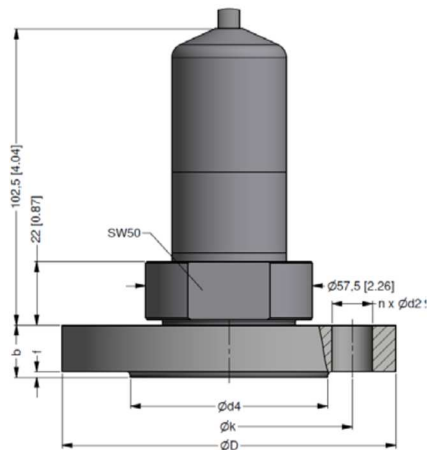
prepared for mounting with stainless steel pipe
stainless steel / CuNiFe

screw-in version

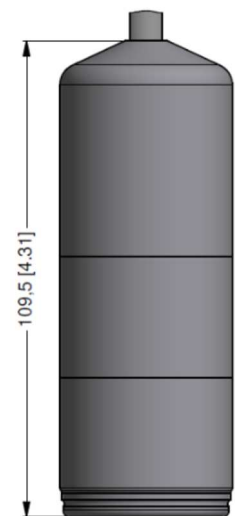


stainless steel / CuNiFe

flange version



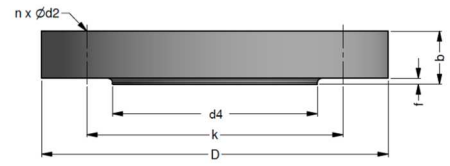
stainless steel / CuNiFe



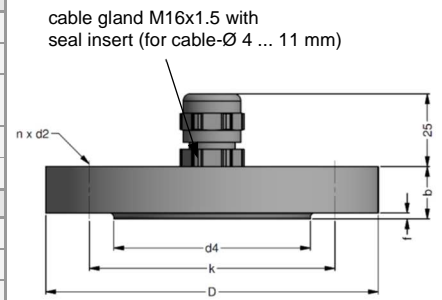
Protection cap removable

This data sheet contains product specification. Properties are not guaranteed. Subject to change without notice.

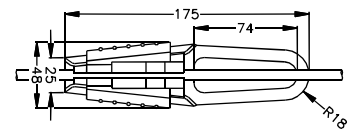
Probe flange for flange version		
Technical data		
Suitable for	LMK 382, LMK 382H, LMK 458, LMK 458H	
Flange material	stainless steel 1.4404 (316L)	
Hole pattern	according to DIN 2507	
Version	Size (in mm)	Weight
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14	1.2 kg
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18	2.6 kg
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18	4.1 kg
Ordering type		Ordering code
Probe flange DN25 / PN40		5000389
Probe flange DN50 / PN40		5000390
Probe flange DN80 / PN16		5000392



Assembling flange with cable gland		
Technical Data		
Suitable for	all probes	
Flange material	stainless steel 1.4404 (316L)	
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305 (303); plastic	
Seal insert	material: TPE (ingress protection IP 68)	
Hole pattern	according to DIN 2507	
Version	Size (in mm)	
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14	
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18	
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18	
Ordering type		Ordering code
Assembling Flange DN25 / PN40		5000275
Assembling Flange DN50 / PN40		5000278
Assembling Flange DN80 / PN16		5000279



Terminal clamp		
Technical data		
Suitable for	all probes with cable \varnothing 5.5 ... 10.5 mm	
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)	
Weight	approx. 160 g	
Ordering type		Ordering code
Terminal clamp, steel, zinc plated		1003440
Terminal clamp, stainless steel 1.4301 (304)		1000278



Ordering code LMK 458

3.4.2020

LMK 458

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Pressure																				
in bar (gauge)		7	6	5																
in m H ₂ O (gauge)		7	6	6																
in bar (absolute)		7	6	8																
Input	[mH ₂ O]	[bar]																		
	0 ... 0.4	0 ... 0,04	0	4	0	0														
	0 ... 0.6	0 ... 0,06	0	6	0	0														
	0 ... 1	0 ... 0,1	1	0	0	0														
	0 ... 1.6	0 ... 0,16	1	6	0	0														
	0 ... 2.5	0 ... 0,25	2	5	0	0														
	0 ... 4	0 ... 0,4	4	0	0	0														
	0 ... 6	0 ... 0,6	6	0	0	0														
	0 ... 10	0 ... 1	1	0	0	1														
	0 ... 16	0 ... 1,6	1	6	0	1														
	0 ... 25	0 ... 2,5	2	5	0	1														
	0 ... 40	0 ... 4	4	0	0	1														
	0 ... 60	0 ... 6	6	0	0	1														
	0 ... 100	0 ... 10	1	0	0	2														
	0 ... 160	0 ... 16	1	6	0	2														
	0 ... 200	0 ... 20	2	0	0	2														
Customer			9	9	9	9														
Housing material																				
Stainless steel 1.4404 (316 L)							1													
Copper-nickel-alloy (CuNi ₁₀ Fe ₁ Mn) - resistant against sea water							K													
Customer							9													
Design																				
Submersible probe							1													
Flange mounting version							3													
Screw-in transmitter (with G 1 1/2" thread)							5													
Customer							9													
Diaphragm material																				
Ceramic Al ₂ O ₃ 96 %							2													
Ceramic Al ₂ O ₃ 99,9 %							C													
Customer							9													
Output																				
4 ... 20 mA / 2-wire							1													
Intrinsic safety Ex ia 4 ... 20 mA / 2-wire							E													
Customer							9													
Seals																				
Viton (FKM)							1													
EPDM							3													
FFKM							7													
Customer							9													
Electrical connection																				
TPE-U - cable, up to 125°C (blue, Ø 7.4 mm, price for 1 m)							4													
Customer							9													
Accuracy																				
0,35 %							3													
0,25 %							2													
0,25 % including Calibration Certificate							R													
0,1 % (P _N ≥ 0,6 bar)							1													
Customer							9													
Cable length																				
in m							9	9	9											
Special version																				
Standard							0	0	0											
Temperature sensor PT100							0	1	3											
R 1" thread - Prepared for mounting v with stainless steel pipe							5	0	2											
Customer							9	9	9											



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The company BD SENSORS s.r.o. is certified by TÜV SÜD Czech according to the standard ISO 9001.



Accessories for submersible transmitter

Terminal clamp - zinc plated	1003440
Terminal clamp - Stainless Steel 1.4301	1000278
Mounting screw PG16 - plastic	5002200
Flange with thread for flange version DN 25/PN 40	5000389
Flange with thread for flange version DN 50/PN 40	5000390
Flange with thread for flange version DN 80/PN 16	5000392
Mounting flange with cable gland (M 16 x 1,5) DN 25/PN 40	5000275
Mounting flange with cable gland (M 16 x 1,5) DN 50/PN 40	5000278
Mounting flange with cable gland (M 16 x 1,5) DN 80/PN 16	5000279

0,-...without additional charge

On request...in accordance with the producer

Version 502 is not possible for CuNiFe !!!

St. steel flange, clamp and pipe are not parts of the supply !!!

Surcharges for calibration are not subject to any discounts. Subject to change.

This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet.

BD SENSORS reserves the right to change sensor specifications without further notice.



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