

# 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 cmH<sub>2</sub>O up to 0 ... 200 mH<sub>2</sub>O

### 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  
Shipping)
- ▶ CCS-certificate  
(China Classification Society)
- ▶ high overpressure resistance
- ▶ high long-term stability

### Optional versions

- ▶ diaphragm Al<sub>2</sub>O<sub>3</sub> 99.9 %
- ▶ different housing materials  
(stainless steel, CuNiFe)
- ▶ IS-version zone 0
- ▶ screw-in and flange version
- ▶ accessories e.g. assembling and probe  
flange, mounting clamp

The hydrostatic probe LMK 458 has been developed 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 pressure 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 medium 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 storage tanks



Pressure ranges																
Nominal pressure <sup>1</sup>	[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 <sub>2</sub> 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							
<sup>1</sup> 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 <sub>S</sub> = 9 ... 32 V <sub>DC</sub>							V <sub>S</sub> rated = 24 V <sub>DC</sub>								
Option IS-version	2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>							V <sub>S</sub> rated = 24 V <sub>DC</sub>								
Performance																
Accuracy <sup>2</sup>	standard: ≤ ± 0.25 % FSO							option: for P <sub>N</sub> ≥ 0.6 bar <sup>3</sup> : ≤ ± 0.1 % FSO								
Permissible load	R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S</sub> 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															
<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																
<sup>3</sup> 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: -25 ... 125 °C							storage: -40 ... 125 °C								
Electrical protection <sup>4</sup>																
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)								
<sup>4</sup> 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)															
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 <sub>2</sub> O <sub>3</sub> 96 %							option: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %								
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																
Optionally cable protection	stainless steel pipe for probe in stainless steel: 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 <sup>5</sup>																
Temperature range	-25 ... 125 °C															
Connection temperature element	3-wire															
Resistance	100 Ω at 0 °C															
Temperature coefficient	3850 ppm/K															
Supply I <sub>s</sub>	0.3 ... 1.0 mA <sub>DC</sub>															
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																
Approval DX4A-LMK 458	IBExU 07 ATEX 1180 X							zone 0: II 1G Ex ia IIB T4								
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> = 105 nF; L <sub>i</sub> = 5 μH; the supply connections have an inner capacity of max. 140 nF opposite the enclosure															
Permissible temp. for environment	in zone 0 <sup>6</sup> : -20 ... 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar							zone 1 and higher: -25 ... 70 °C								
Connecting cables (by factory)	cable capacity: cable inductance:							signal line/shield as well as signal line/signal line: 160 pF/m signal line/shield as well as signal line/signal line: 1 μH/m								
<sup>5</sup> only for 4...20mA, cable length max. 5m																
<sup>6</sup> for optional stainless steel pipe the following designation is valid: "II 1 G Ex ia IIC T4" (zone 0)																

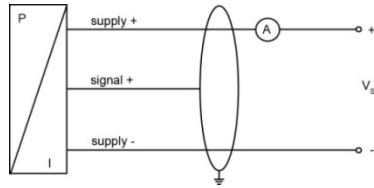
# LMK 458

Hydrostatic Probe

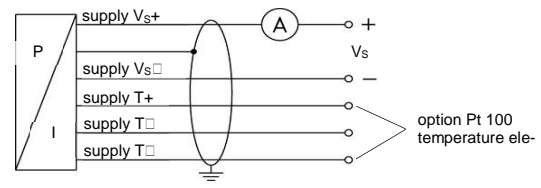
Technical Data

## 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)

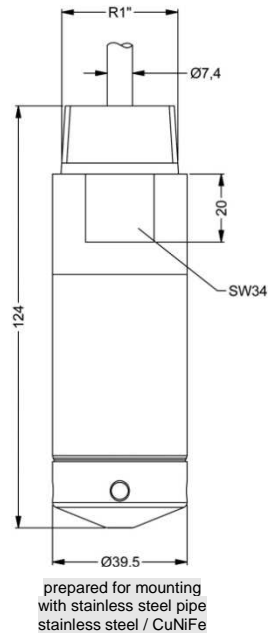
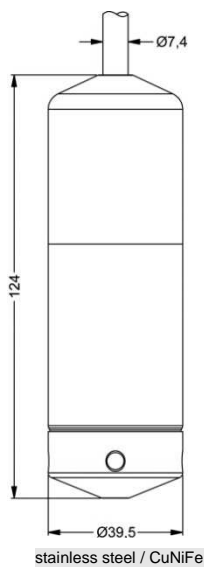
wh (white)  
bn (brown)  
  
ye (yellow)  
gy (grey)  
pk (pink)

Shield

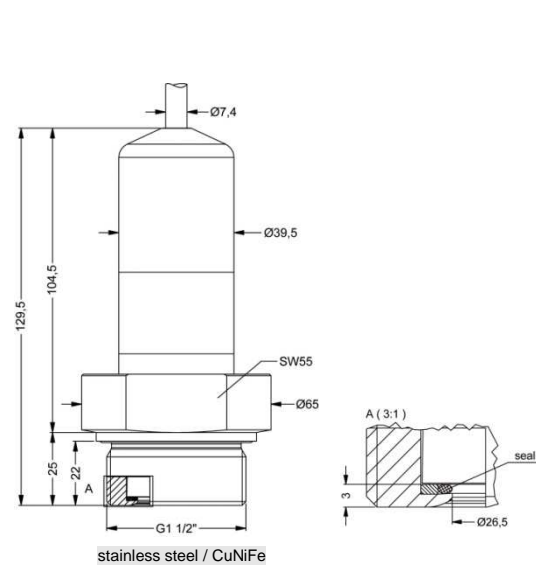
gn/ye (green / yellow)

## Dimensions (in mm)

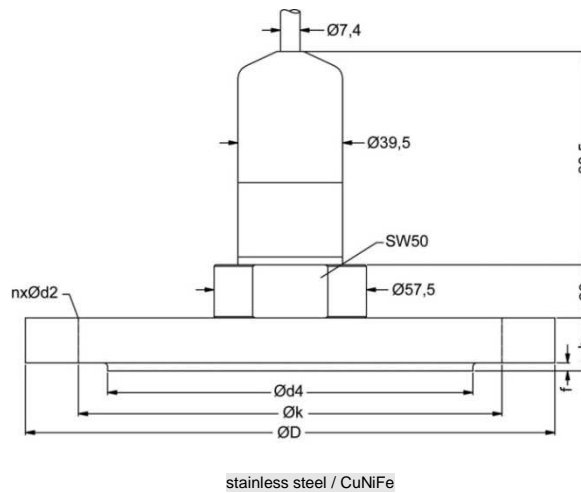
probe versions



screw-in version

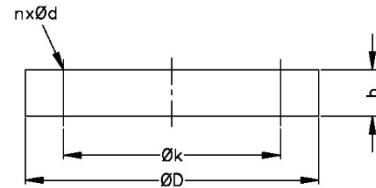


flange version



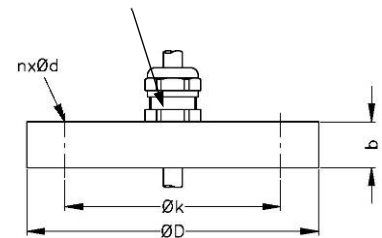
This data sheet contains product specification. properties are not guaranteed. Subject to change without notice.

Probe flange for flange version		
<b>Technical data</b>		
Suitable for	LMK 382, LMK 382H, LMK 458, LMK 458H	
Flange material	stainless steel 1.4404 (316L)	
Hole pattern	according to DIN 2507	
<b>Version</b>	<b>Size (in mm)</b>	<b>Weight</b>
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
<b>Ordering type</b>		<b>Ordering code</b>
Probe flange DN25 / PN40		5000389
Probe flange DN50 / PN40		5000390
Probe flange DN80 / PN16		5000392



Assembling flange with cable gland		
<b>Technical Data</b>		
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	
<b>Version</b>	<b>Size (in mm)</b>	
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	
<b>Ordering type</b>		<b>Ordering code</b>
Assembling Flange DN25 / PN40		5000275
Assembling Flange DN50 / PN40		5000278
Assembling Flange DN80 / PN16		5000279

cable gland M16x1.5 with seal insert (for cable-Ø 4 ... 11 mm)



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

