

# 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 certified 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 diaphragm element 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 and absolute; nominal pressure ranges absolute from 1 bar																
Output signal / Supply																
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 10 ... 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> = 12 ... 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 at reference conditions															
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 (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>															
<sup>5</sup> only for 4...20 mA, cable length max. 5 m																
Category of the environment																
Lloyd's Register (LR)	EMV1, EMV2, EMV3, EMV4								number of certificate: 13/20055							
Det Norske Veritas	temperature: D				vibration: B				number of certificate: TAA00001GM							
Germanischer Lloyd (DNV GL)	humidity: B				enclosure: D				electromagnetic compatibility: B							
Explosion protection																
Approval DX14A-LMK 458	IBExU 07 ATEX 1180 X								zone 0 <sup>6</sup> : II 1G Ex ia IIB T4 Ga							
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 temperatures for environment	in zone 0: -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: 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															
<sup>6</sup> for optional stainless steel pipe the following designation is valid: "II 1 G Ex ia IIC T4" (zone 0)																

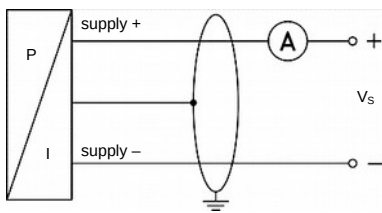
# LMK 458

Hydrostatic Probe

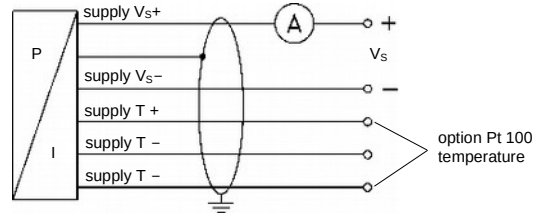
Technical Data

## Wiring diagrams

2-wire-system (current)



2-wire-system (current) with Pt 100

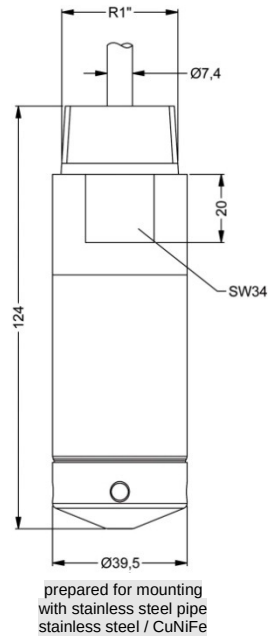
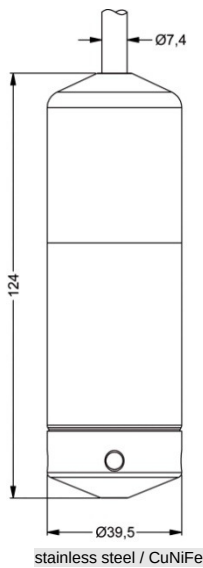


## Pin configuration

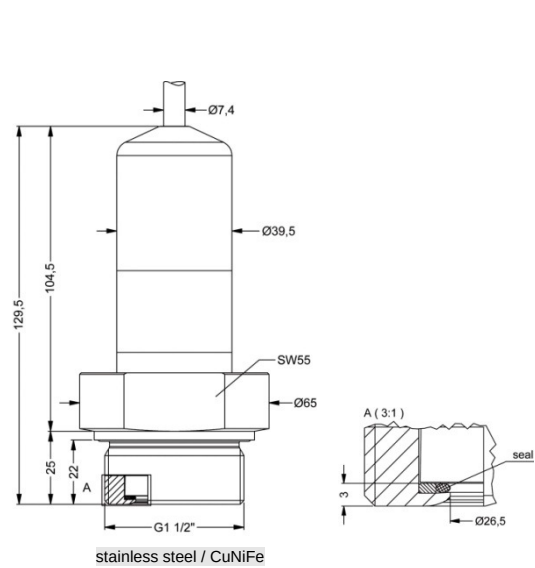
Electrical connection	cable colours (IEC 60757)
Supply $V_s+$	wh (white)
Supply $V_s-$	bn (brown)
Option Pt 100 temperature element:	
Supply T+ (with Pt 100)	ye (yellow)
Supply T- (with Pt 100)	gy (grey)
Supply T- (with Pt 100)	pk (pink)
Shield	gnye (green-yellow)

## Dimensions (in mm)

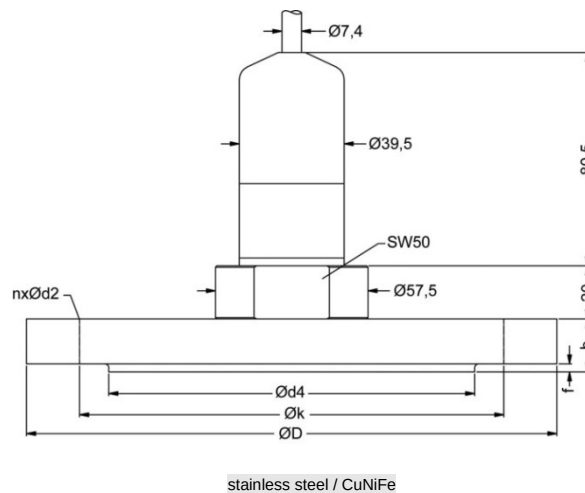
probe versions



screw-in version



flange version



Probe flange for flange version	
<b>Technical Data</b>	
Suitable for	LMK 382, LMK 382H, LMK 458
Flange material	stainless steel 1.4404 (316L)
Hole pattern	according to DIN 2507
<b>Version</b>	<b>Size (in mm)</b>
DN25 / PN40	D = 115, k = 85, d4 = 68, b = 18, f = 2, n = 4, d2 = 14
DN50 / PN40	D = 165, k = 125, d4 = 102, b = 20, f = 3, n = 4, d2 = 18
DN80 / PN16	D = 200, k = 160, d4 = 138, b = 20, f = 3, n = 8, d2 = 18
<b>Ordering type</b>	
Probe flange DN25 / PN40	ZSF2540
Probe flange DN50 / PN40	ZSF5040
Probe flange DN80 / PN16	ZSF8016

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>	
Assembling Flange DN25 / PN40	ZMF2540
Assembling Flange DN50 / PN40	ZMF5040
Assembling Flange DN80 / PN16	ZMF8016

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

