



# LMK 458H

## Probe with HART®-communication for Marine and Offshore

Ceramic Sensor

accuracy according to IEC 60770:  
0.1 % FSO

### Nominal pressure

from 0 ... 60 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

- ▶ shipping approvals acc. to:  
Lloyd's Register (LR),  
Det Norske Veritas (DNV),  
China Classification Society (CCS),  
American Bureau of Shipping (ABS)
- ▶ diameter 39.5 mm
- ▶ HART® communication  
(setting of offset, span and damping)
- ▶ high overpressure resistance
- ▶ high long-term stability



### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gas and dust
- ▶ diaphragm Al<sub>2</sub>O<sub>3</sub> 99.9 %
- ▶ different housing materials  
(stainless steel, CuNiFe)
- ▶ screw-in and flange version
- ▶ accessories e. g. assembling and  
probe flange, mounting clamp

The hydrostatic probe LMK 458H has been developed for measuring level in service and storage tanks and is certificated for shipbuilding and offshore applications.

A permissible operating temperature up to 85°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 458H is a self-developed capacitive ceramic sensor 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  
draught monitoring  
level measurement in ballast and  
storage tanks



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Probe for Marine and Offshore

Technical Data

Pressure ranges									
Nominal pressure gauge <sup>1</sup>	[bar]	0.06	0.16	0.4	1	2	5	10	20
Level	[mH <sub>2</sub> O]	0.6	1.6	4	10	20	50	100	200
Overpressure	[bar]	2	4	6	8	15	25	35	45
Max. ambient pressure (housing): 40 bar									
<sup>1</sup> on customer request we adjust the devices by software on the required pressure ranges, within the turn-down possibility (starting at 0.02 bar)									
Output signal / Supply									
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 12 ... 36 V <sub>DC</sub>				with HART® communication			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>				with HART® communication			V <sub>S</sub> rated = 24 V <sub>DC</sub>	
Performance									
Accuracy <sup>2</sup>	p <sub>N</sub> ≥ 160 mbar		TD ≤ 1:5 TD > 1:5		≤ ± 0.2 % FSO ≤ ± [0.2 + 0.03 x TD] % FSO			TD <sub>max</sub> = 1:10	
	p <sub>N</sub> < 160 mbar				≤ ± [0.2 + 0.1 x TD] % FSO			TD <sub>max</sub> = 1:3	
	p <sub>N</sub> ≥ 1 bar		TD ≤ 1:5 TD > 1:5		≤ ± 0.1 % FSO ≤ ± [0.1 + 0.02 x TD] % FSO			TD <sub>max</sub> = 1: 10	
Permissible load	R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S</sub> min) / 0.02 A] Ω				load at HART®-communication: R <sub>min</sub> = 250 Ω				
Long term stability	≤ ± (0.1 x turn-down) FSO / year at reference conditions								
Influence effects	supply: 0.05 % FSO / 10 V				permissible load: 0.05 % FSO / kΩ				
Turn-on time	850 msec								
Mean response time	140 msec without consideration of electronic damping						mean measuring rate 7/sec		
Max. response time	380 msec								
Adjustability	configuration of following parameters possible (interface / software necessary <sup>3</sup> ): electronic damping: 0 ... 100 sec      offset: 0 ... 80 % FSO      turn down of span: max. 1:10								
<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)									
<sup>3</sup> software, interface, and cable have to be ordered separately (software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or higher, and XP)									
Thermal effects (offset and span) / Permissible temperatures									
Tolerance band	≤ ± 1 % FSO								
in compensated range	-20 ... 80 °C								
Permissible temperatures	medium / electronics / environment / storage: -25 ... 85 °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 (Det Norske Veritas)								
<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: class B, curve 2 / basis: DIN EN 60068-2-6)								
Electrical connection									
Cable with sheath material <sup>5</sup>	TPE-U    blue    Ø 7.4 mm								
Bending radius	static installation: 10-fold cable diameter				dynamic application: 20-fold cable diameter				
<sup>5</sup> shielded cable with integrated ventilation tube for atmospheric pressure reference (for nominal pressure ranges absolute the ventilation tube is closed)									
Materials (media wetted)									
Housing	standard: stainless steel 1.4404 (316L)				option: CuNi10Fe1Mn (resistant against sea water)				
Seals	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 %				
Protection cap	POM-C								
Cable sheath	TPE-U    (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								
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								
Category of the environment									
Lloyd´s Register (LR)	EMV1, EMV2, EMV3, EMV4				number of certificate: 13/20056				
Det Norske Veritas (DNV)	temperature: D		vibration: B		number of certificate: TAA00001GM				
	humidity: B		enclosure: D						
	electromagnetic compatibility:		B						
Explosion protection									
Approval DX15A-LMK 458H	IBExU 10 ATEX 1186 X    zone 0 <sup>6</sup> : II 1G Ex ia IIB T4 Ga    zone 20: II 1D Ex ia IIIC T135 °C Da								
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> = 94,6 nF; L <sub>i</sub> = 0 µH; the supply connections have an inner capacity of max. 110 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 1G Ex ia IIC T4" (zone 0)									

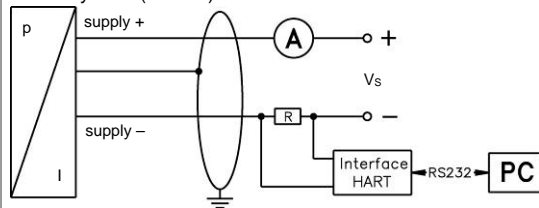
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Technical Data

## Wiring diagram

2-wire-system (current) HART®

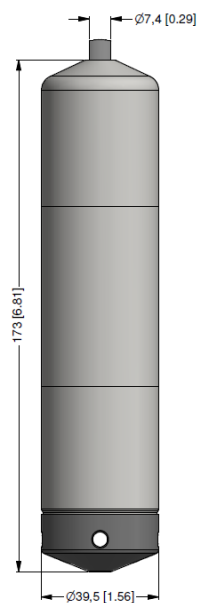


## Pin configuration

Electrical connection		cable colours (IEC 60757)
Supply $V_S +$		WH (white)
Supply $V_S -$		BN (brown)
Shield		GNYE (green-yellow)

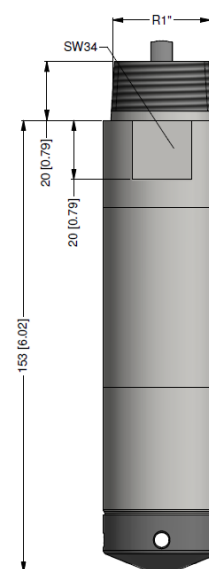
## Dimensions for housing in stainless steel and CuNiFe (mm / in)

probe



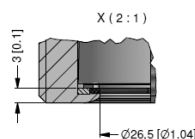
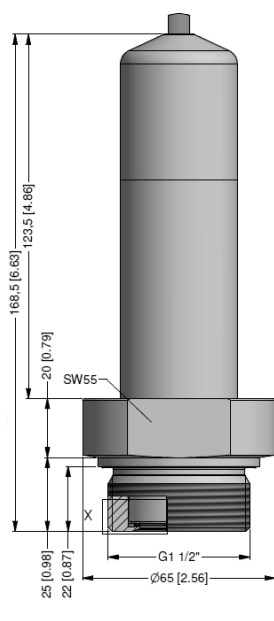
protection cap removable

option

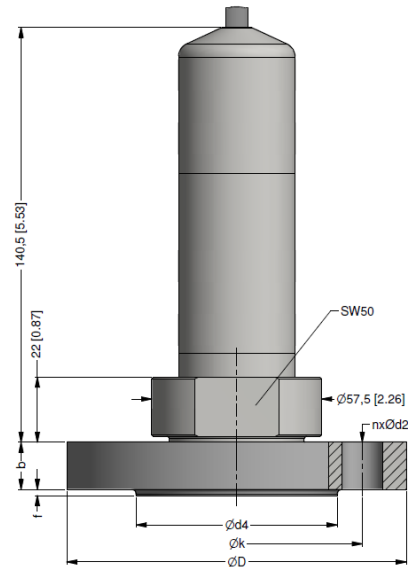


prepared for mounting with stainless steel pipe

screw-in version



flange version



⇒ transmitter flange is not part of supply and has to be ordered separately

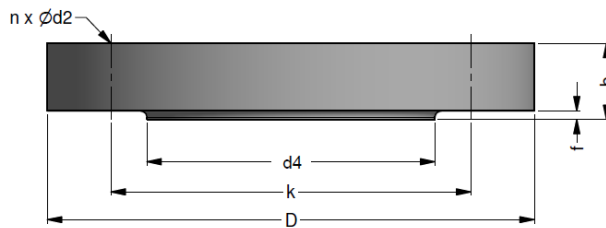
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Accessories

## Transmitter flange for flange version



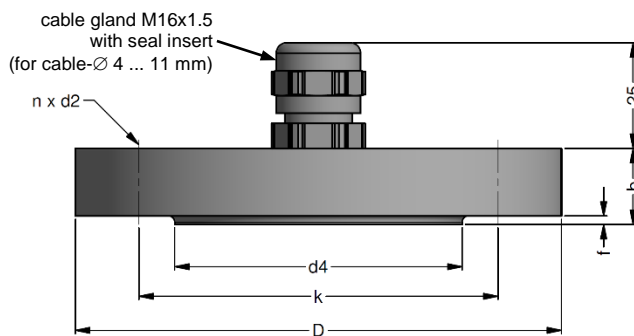
dimensions in mm			
size	DN25 / PN40	DN50 / PN40	DN80 / PN16
b	18	20	20
D	115	165	200
d2	14	18	18
d4	68	102	138
f	2	3	3
k	85	125	160
n	4	4	8

### 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

Ordering type	Ordering code	Weight
Transmitter flange DN25 / PN40	ZSF2540	1.2 kg
Transmitter flange DN50 / PN40	ZSF5040	2.6 kg
Transmitter flange DN80 / PN16	ZSF8016	4.1 kg

## Mounting flange with cable gland



dimensions in mm			
size	DN25 / PN40	DN50 / PN40	DN80 / PN16
b	18	20	20
D	115	165	200
d2	14	18	18
d4	68	102	138
f	2	3	3
k	85	125	160
n	4	4	8

### 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

Ordering type	Ordering code	Weight
DN25 / PN40 with cable gland brass, nickel plated	ZMF2540	1.4 kg
DN50 / PN40 with cable gland brass, nickel plated	ZMF5040	3.2 kg
DN80 / PN16 with cable gland brass, nickel plated	ZMF8016	4.8 kg

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Ordering code LMK 458H

LMK 458H

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[illegible]<sup>1</sup> nominal pressure ranges and absolute from 1 bar

<sup>2</sup> mounting accessories are not part of supply and have to be ordered separately

<sup>3</sup> min, permissible temperature from -15°C<sup>4</sup> shielded cable with integrated ventilation tube for atmospheric reference

<sup>5</sup> possible for probes in stainless steel; stainless steel pipe is not part of the supply

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