

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 cmH₂O up to 0 ... 200 mH₂O

Output signals

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

Special characteristics

- ▶ shipping approvals acc. to:
Lloyd's Register (LR), Det Norske Veritas
▪ Germanischer Lloyd (DNV•GL)
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 Al₂O₃ 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 ¹	[bar]	0.06	0.16	0.4	1	2	5	10	20	
Level	[mH ₂ O]	0.6	1.6	4	10	20	50	100	200	
Overpressure	[bar]	2	4	6	8	15	25	35	45	
¹ 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 _S = 12 ... 36 V _{DC}	with HART [®] communication					V _{S rated} = 24 V _{DC}			
Option IS-version	2-wire: 4 ... 20 mA / V _S = 14 ... 28 V _{DC}	with HART [®] communication					V _{S rated} = 24 V _{DC}			
Performance										
Accuracy ²	P _N ≥ 160 mbar	TD ≤ 1:5		≤ ± 0.2 % FSO				TD _{max} = 1:10		
	P _N < 160 mbar	TD > 1:5		≤ ± [0.2 + 0.03 x TD] % FSO				TD _{max} = 1:3		
	P _N ≥ 1 bar	TD ≤ 1:5		≤ ± 0.1 % FSO				TD _{max} = 1:10		
		TD > 1:5		≤ ± [0.1 + 0.02 x TD] % FSO						
Permissible load	R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω load at HART [®] -communication: R _{min} = 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 ³): electronic damping: 0 ... 100 sec offset: 0 ... 80 % FSO turn down of span: max. 1:10									
² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)										
³ 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	≤ ± [0.2 x turn-down] % FSO									
TC, average	≤ ± [0.02 x turn-down] % FSO / 10 K									
In compensated range	-20 ... 80 °C									
Permissible temperatures	medium / electronics / environment / storage: -25 ... 85 °C									
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)									
Electrical connection										
Cable with sheath material ⁵	TPE-U blue Ø 7.4 mm									
Bending radius	static installation: 10-fold cable diameter dynamic application: 20-fold cable diameter									
⁵ shielded cable with integrated ventilation tube for atmospheric pressure reference (for nominal pressure ranges absolute and sealed gauge, 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 ₂ O ₃ 96 % option: ceramics Al ₂ O ₃ 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; 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									
Category of the environment										
Lloyd's Register	EMV1, EMV2, EMV3, EMV4						number of certificate: 13/20056			
Det Norske Veritas • Germanischer Lloyd (DNV•GL)	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 ⁶ : II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T85 °C Da									
Safety technical maximum values	U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C _i = 94,6 nF; L _i = 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 _{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									
⁶ for optional stainless steel pipe the following designation is valid: "II 1G Ex ia IIC T4" (zone 0)										

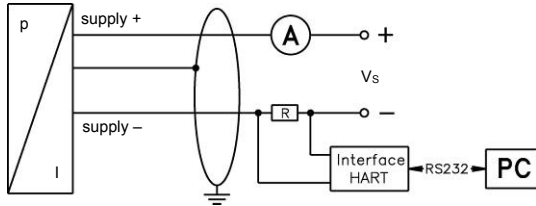
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Technical Data

Wiring diagram

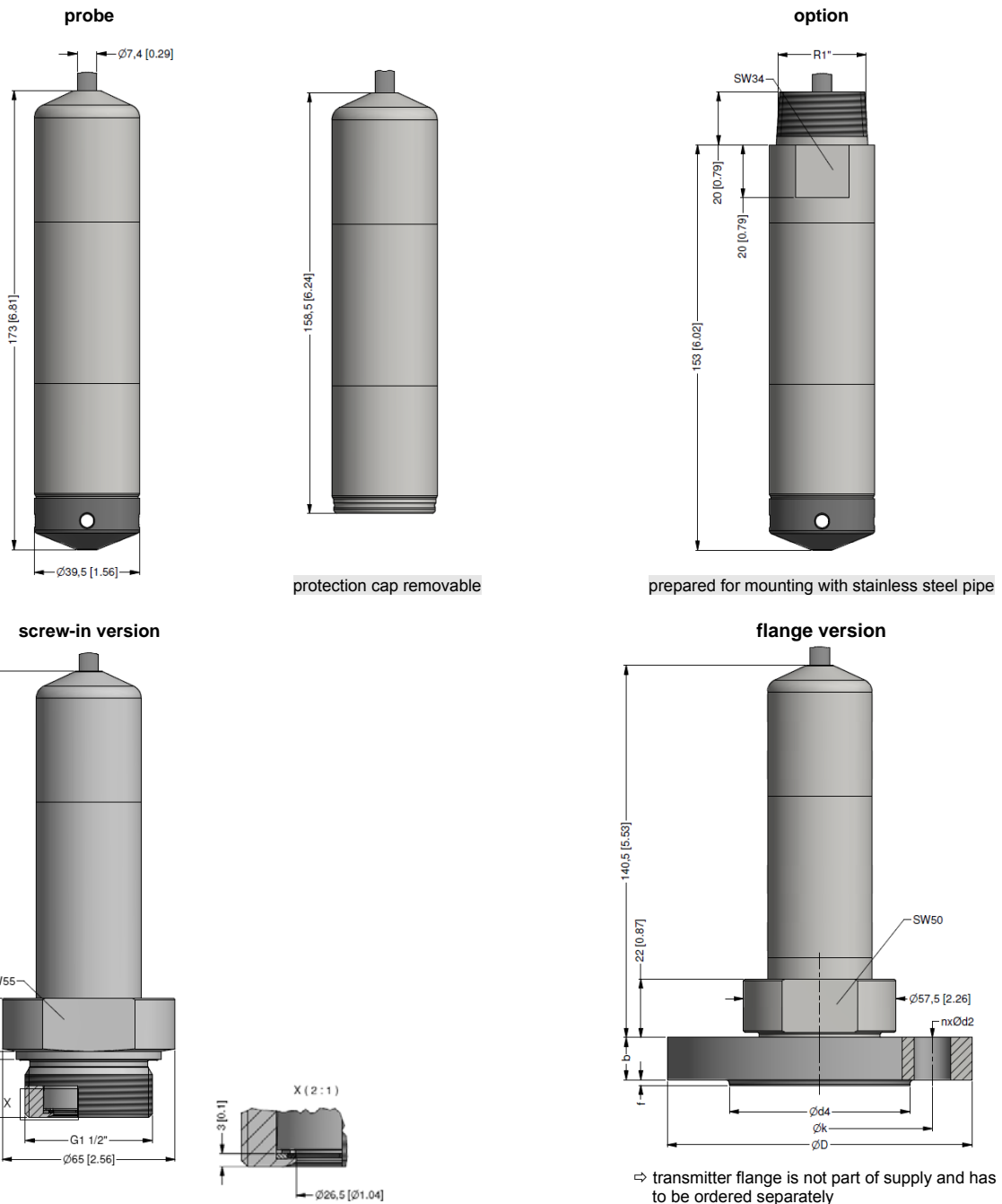
2-wire-system (current) HART®



Pin configuration

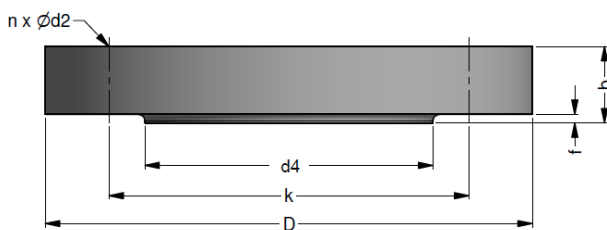
Electrical connection	cable colours (IEC 60757)
Supply V_s +	WH (white)
Supply V_s -	BN (brown)
Shield	GNYE (green-yellow)

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



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Transmitter flange for flange version

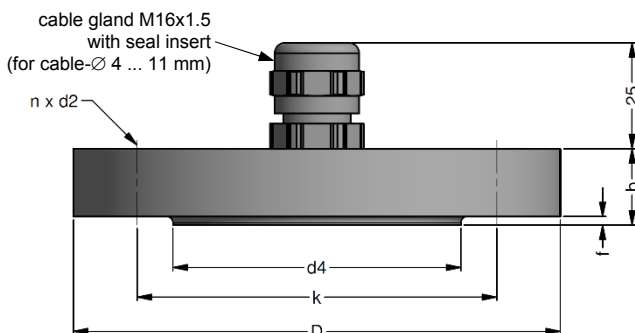


dimensions in mm			
size	DN25 / PN40	DN50 / PN40	DN80 / PN16
b	18	20	20
D	115	165	200
d2	14	18	18
d4	68	102	138
f	2	3	3
k	85	125	160
n	4	4	8

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



Pressure										
	in bar, gauge	7	6	E						
	in bar, sealed gauge ¹	7	6	G						consult
	in bar, absolute ¹	7	6	H						
	in mH ₂ O	7	6	F						
Input										
	[mH ₂ O]	[bar]								
	0.6	0.06	0	6	0	0				
	1.6	0.16	1	6	0	0				
	4.0	0.40	4	0	0	0				
	10	1.0	1	0	0	1				
	20	2.0	2	0	0	1				
	50	5.0	5	0	0	1				
	100	10	1	0	0	2				
	200	20	2	0	0	2				
	customer		9	9	9	9				consult
Housing										
	stainless steel 1.4404 (316L)						1			
	copper-nickel-alloy (CuNi10Fe1Mn)						K			
	customer						9			consult
Design										
	probe						1			
	flange version ²						3			
	screw-in version						5			
Diaphragm										
	ceramics Al ₂ O ₃ 96 %						2			
	ceramics Al ₂ O ₃ 99.9 %						C			
	customer						9			consult
Output										
	HART [®] -communication						H			
	4 ... 20 mA / 2-wire									
	HART [®] -communication						I			
	intrinsic safety 4 ... 20 mA / 2-wire									
	customer						9			consult
Seals										
	FKM						1			
	EPDM						3			
	FFKM ³						7			
	customer						9			consult
Electrical connection										
	TPE-U-cable (blue, Ø 7.4 mm) ⁴						4			
	customer						9			
Accuracy										
	p _N ≥ 1 bar:	0.1 % FSO					1			
	p _N < 1 bar:	0.2 % FSO					B			
	customer						9			consult
Cable length										
	in m						9	9	9	
Special version										
	standard						0	0	0	
	prepared for mounting						5	0	2	
	with stainless steel pipe ⁵									
	customer						9	9	9	consult

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¹ nominal pressure ranges sealed gauge and absolute from 1 bar

² mounting accessories are not part of supply and have to be ordered separately

³ min. permissible temperature from -15°C

⁴ shielded cable with integrated ventilation tube for atmospheric reference

⁵ possible for probes in stainless steel; stainless steel pipe is not part of the supply

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