

# LMK 487



## Probe For Marine And Offshore 22 mm

Ceramic Sensor

accuracy according to IEC 60770:  
standard: 0.35 % FSO  
option: 0.25 % FSO

### Nominal pressure

from 0 ... 1 mH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

### Output signals

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

### Special characteristics

- ▶ diameter 22 mm
- ▶ diaphragm ceramics 96% Al<sub>2</sub>O<sub>3</sub>
- ▶ high long-term stability

### Optional versions

- ▶ diaphragm ceramics 99,9% Al<sub>2</sub>O<sub>3</sub>
- ▶ housing material titanium
- ▶ IS-version Ex ia = intrinsically safe for gases and dust
- ▶ different kinds of elastomer

The hydrostatic probe LMK 487 has been developed for measuring level in service and storage tanks. With having all necessary approvals the probe is predestined for shipbuilding and offshore applications. In comparison to the hydrostatic probe LMK 458 the external diameter amounts to only 22 mm by which the installation in 1" pipes can be carried out easily.

Beside the housing materials stainless steel and titanium, elastomer materials are available by which an optimum adaptation to the application can be produced.

### Preferred areas of use

#### Water



drinking water abstraction  
desalination plant

#### Shipbuilding / Offshore



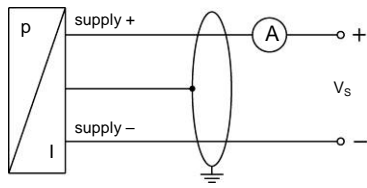
ballast tanks  
draught monitoring  
level measurement in ballast  
and storage tanks



Input pressure range												
Nominal pressure gauge	[bar]	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure	[bar]	3	4	5	5	7	7	12	20	20	20	20
Burst pressure ≥	[bar]	4	6	8	8	9	9	18	25	25	30	30
Permissible vacuum	[bar]	-0.2	-0.3			-0.5					-1	
Output signal / Supply												
Standard		4 ... 20 mA / V <sub>S</sub> = 12 ... 36 V <sub>DC</sub>										
Option IS-protection		4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>										
Performance												
Accuracy <sup>1</sup>		standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO										others on request
Permissible load		R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω										
Influence effects		supply: 0.05 % FSO / 10 V					load: 0.05 % FSO / kΩ					
Long term stability		≤ ± 0.1 % FSO / year										
Turn-on time		450 msec										
Mean response time		≤ 70 msec										
Measuring rate		80 Hz										
<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)												
Thermal effects (Offset and Span)												
Tolerance band		≤ 1.0% FSO in compensated range -20 ... 80 °C										
Permissible temperatures												
Permissible temperatures		medium:		standard:	-40 ... 85 °C	option:	-40 ... 125 °C					
		electronics / environment:		standard:	-40 ... 85 °C	option:	-40 ... 125 °C					
		storage:			-40 ... 85 °C							
Electrical protection <sup>2</sup>												
Short-circuit protection		permanent										
Reverse polarity protection		no damage, but also no function										
Electromagnetic compatibility		emission and immunity according to EN 61326 approval according to the standards GL, DNV, CCS, Lloyd's Register										
<sup>2</sup> additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request												
Mechanical stability												
Vibration		4 g (according to GL: curve 2 / according to DNV: Class B / basis: DIN EN 60068-2-6)										
Electrical connection												
Cable		shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges absolute, the air tube is closed)										
Materials (media wetted)												
Housing		standard: stainless steel 1.4404 (316 L) option: titanium (resistant against sea water)										others on request
Cable sheath		TPE -U (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil)										
Seals (O-rings)		standard: FKM option: 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										
Explosion protection												
Approval	DX14B-LMK 487	<b>IBExU 15 ATEX 1066 X</b> zone 0: II 1G Ex ia IIC 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> = 49,2 nF; L <sub>i</sub> = 0 μH; the supply connections have an inner capacity of max. 100 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: 100 pF/m cable inductance: signal line/shield as well as signal line/signal line: 1 μH/m										
Miscellaneous												
Current consumption		max. 22 mA										
Weight		approx. 180 g (without cable)										
Ingress protection		IP 68										
CE-conformity		EMC Directive: 2014/30/EU										
Pin configuration												
Electrical connection		cable colours (IEC 60575)										
	Supply +	wh (white)										
	Supply -	bn (brown)										
	Shield	gnye (green-yellow)										

## Wiring diagrams

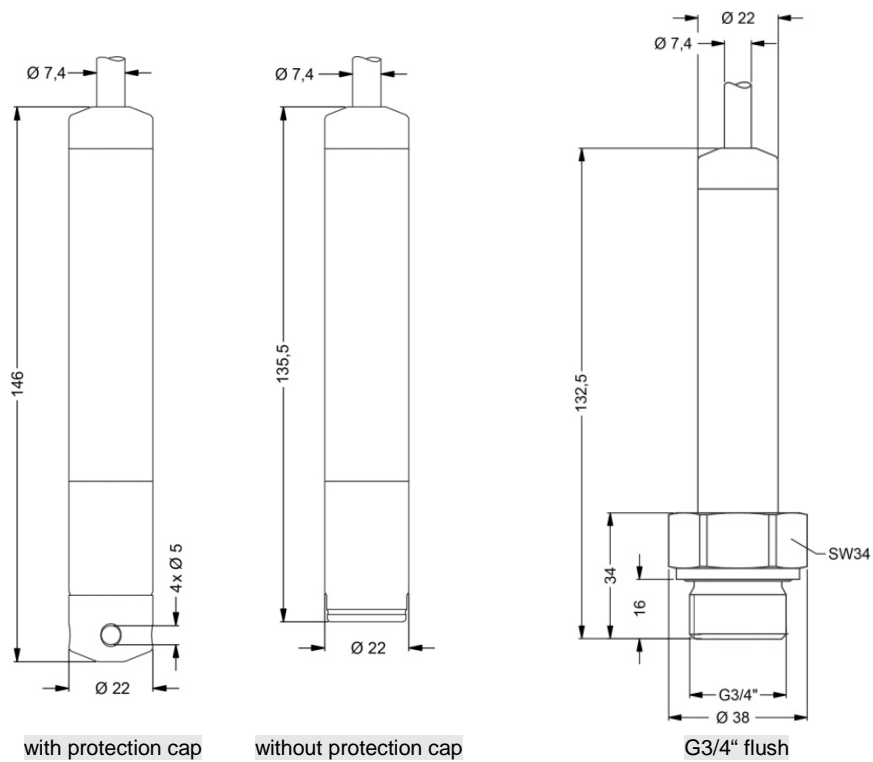
2-wire-system (current)



## Dimensions (in mm)

standard

option: screw-in version



Mounting 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>	<b>Weight</b>
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14	1.4 kg
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18	3.2 kg
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18	4.8 kg
<b>Ordering type</b>		<b>Ordering code</b>
DN25 / PN40 with cable gland brass, nickel plated		ZMF2540
DN50 / PN40 with cable gland brass, nickel plated		ZMF5040
DN80 / PN16 with cable gland brass, nickel plated		ZMF8016
<b>Terminal clamp</b>		
<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		Z100528
Terminal clamp, stainless steel 1.4301 (304)		Z100527
<b>Display program</b>		
<p><b>CIT 200</b> Process display with LED display</p> <p><b>CIT 250</b> Process display with LED display and contacts</p> <p><b>CIT 300</b> Process display with LED display, contacts and analogue output</p> <p><b>CIT 350</b> Process display with LED display, bargraph, contacts and analogue output</p> <p><b>CIT 400</b> Process display with LED display, contacts, analogue output and Ex-approval</p> <p><b>CIT 600</b> Multichannel process display with graphics-capable LC display</p> <p><b>CIT 650</b> Multichannel process display with graphics-capable LC display and datalogger</p> <p><b>CIT 700 / CIT 750</b> Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts</p> <p><b>PA 440</b> Field display with 4-digit LC display</p>		
<p>For further information please contact our sales department or visit our homepage: <a href="http://www.bdsensors.com">http://www.bdsensors.com</a></p>		

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