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

A permissible operating temperature 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
  - desalination plant
- **Shipbuilding / Offshore**
  - ballast tanks
  - monitoring of a ship’s position and draught
  - level measurement in ballast and storage tanks
**Pressure ranges**

<table>
<thead>
<tr>
<th>Pressure ranges</th>
<th>[bar]</th>
<th>0.04</th>
<th>0.06</th>
<th>0.1</th>
<th>0.16</th>
<th>0.25</th>
<th>0.4</th>
<th>0.6</th>
<th>1</th>
<th>1.6</th>
<th>2.5</th>
<th>4</th>
<th>6</th>
<th>10</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal pressure gauge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Level</td>
<td>[mH2O]</td>
<td>0.4</td>
<td>0.6</td>
<td>1</td>
<td>1.6</td>
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<td>4</td>
<td>6</td>
<td>10</td>
<td>16</td>
<td>25</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td>160</td>
<td>200</td>
</tr>
<tr>
<td>Overpressure</td>
<td>[bar]</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>15</td>
<td>25</td>
<td>25</td>
<td>35</td>
<td>35</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Permissible vacuum</td>
<td>[bar]</td>
<td>-0.2</td>
<td>-0.3</td>
<td>-0.5</td>
<td>-1</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Max. ambient pressure (housing): 40 bar

1 available in gauge and absolute; nominal pressure ranges absolute from 1 bar

**Output signal / Supply**

<table>
<thead>
<tr>
<th>Output signal / Supply</th>
<th>Standard</th>
<th>Option IS-version</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wire: 4 ... 20 mA /</td>
<td>V_s = 10 ... 32</td>
<td>V_s = 12 ... 28</td>
</tr>
<tr>
<td>V_s rated = 24 V_OC</td>
<td>V_s rated = 24 V_OC</td>
<td></td>
</tr>
<tr>
<td>Approval DX14A-LMK 458</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp. protection</td>
<td>Det Norske Veritas</td>
<td></td>
</tr>
<tr>
<td>DET / LR</td>
<td>Lloyd’s Register (LR)</td>
<td></td>
</tr>
<tr>
<td>Category of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>environment</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Supply I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td>CE</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>max. 21 mA</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>min. 650 g (without cable)</td>
<td></td>
</tr>
<tr>
<td>CE-conformity</td>
<td>EMC Directive: 2014/30/EU</td>
<td></td>
</tr>
<tr>
<td>ATEX Directive</td>
<td>2014/34/EU</td>
<td></td>
</tr>
</tbody>
</table>

**Approval**

DBexU 07 ATEX 1180 X

**Safety technical maximum values**

U < 28 V, I < 93 mA, P < 660 mW, C< 105 nF; L ≤ 0 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 pm = 0.8 bar up to 1.1 bar
zone 1 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 |

1 not possible in combination with Pt 100 temperature element

**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

**Option Pt 100 temperature element**

Temperature range -25 ... 125°C

Connection temperature element 3-wire

Resistance 100 Ω at 0°C

Temperature coefficient 3850 ppm/K

Supply Is 0.3 ... 1.0 mA DC

1 not possible in combination with IS-version

**Category of the environment**

Lloyd’s Register [LR] EMV1, EMV2, EMV3, EMV4 number of certificate: 13/20056

Det Norske Veritas + Germanischer Lloyd (DNV+GL) temperature: D vibration: B number of certificate: TAA00001GM

**Explosion protection**

Approval DX14A-LMK 458 IBExU 07 ATEX 1180 X zone 0 6. II 1 G Ex ia IIB T4 Ga

**Mechanical stability**

Vibration 4 g (according to DNV+GL: class B, curve 2 / basis: DIN 60068-2-6)

1 electromagnetic compatibility: emission and immunity according to - EN 61326 - DNV+GL (Det Norske Veritas + Germanischer Lloyd)

2 additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available

3 additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available

**Materials**

Housing standard: stainless steel 1.4404 (316L)

option: CuNi10Fe1Mn (resistant against sea water)

Seals (media wetted) standard: EPDM, FFKM (min. permissible temperature from -15 °C) others on request

option: ceramics Al2O3 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)

**Electrical connection**

Cable with sheath material 9 TPE-U blue Ø 7.4 mm

Bending radius static installation: 10-fold cable diameter dynamic application: 20-fold cable diameter

1 shielded cable with integrated ventilation tube for atmospheric pressure reference (for nominal pressure ranges absolute, the ventilation tube is closed)

**Electrical protection**

Short-circuit protection permanent

Reverse polarity protection no damage, but also no function

Electromagnetic compatibility

- Linearity, hysteresis, permanent distortion
- Permissible load: 0.05 % FSO / kΩ

- Mean response time: < 200 msec

- Max. response time: 380 msec

**Tolerance band**

≤ ± 1 % FSO in compensated range -20 … 80 °C

Permissible temperatures medium / electronics / environment: -25 ... 125 °C storage: -40 ... 125 °C

Accuracy 2 standard: ≤ ± 0.25 % FSO option: for Pn ≥ 0.6 bar 2; ≤ ± 0.1 % FSO

Permissible load R_max = [(V_s – V_s 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

3850 ppm/K

Accuracy 3 ± 0.1 % FSO / year

Response time RC = 10 sec

Maximum response time T = 1 ms

4 g (according to DNV+GL: class B, curve 2 / basis: DIN 60068-2-6)

**Protection cap**

static: 5 μA / V max. 25 mA @ 1000 V

dynamic application: 20 μA / V max. 25 mA @ 1000 V

Current consumption max. 21 mA

Maximum overload: 4 g @ 100 ms

Reverse polarisation protection

- No damage, but also no function

Electromagnetic compatibility

- Linearity, hysteresis, permanent distortion

- Permissible load: 0.05 % FSO / kΩ

- Mean response time: < 200 msec

- Max. response time: 380 msec

Tolerance band

≤ ± 1 % FSO in compensated range -20 … 80 °C

Permissible temperatures medium / electronics / environment: -25 ... 125 °C storage: -40 ... 125 °C

Accuracy 2 standard: ≤ ± 0.25 % FSO option: for Pn ≥ 0.6 bar 2; ≤ ± 0.1 % FSO

Permissible load R_max = [(V_s – V_s 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

1 accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

2 under the influence of disturbance burst according to EN 61000-4-4 (2004) ±2 kV accuracy decreased to ≤ ± 0.25 % FSO

3 additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available

4 additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available

5 accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

6 under the influence of disturbance burst according to EN 61000-4-4 (2004) ±2 kV accuracy decreased to ≤ ± 0.25 % FSO

7 accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

8 under the influence of disturbance burst according to EN 61000-4-4 (2004) ±2 kV accuracy decreased to ≤ ± 0.25 % FSO

9 accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)
Wiring diagrams

2-wire-system (current)

2-wire-system current (pressure) / 3-wire-system (temperature)

Pin configuration

<table>
<thead>
<tr>
<th>Electrical connection</th>
<th>cable colours (IEC 60757)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply V₅ +</td>
<td>WH (white)</td>
</tr>
<tr>
<td>Supply V₅ –</td>
<td>BN (brown)</td>
</tr>
<tr>
<td>Option Pt 100.</td>
<td></td>
</tr>
<tr>
<td>temperature element:</td>
<td></td>
</tr>
<tr>
<td>Supply T₉</td>
<td>YE (yellow)</td>
</tr>
<tr>
<td>Supply T₀</td>
<td>GY (grey)</td>
</tr>
<tr>
<td>Supply T₀ –</td>
<td>PK (pink)</td>
</tr>
<tr>
<td>Shield</td>
<td>GNYE (green-yellow)</td>
</tr>
</tbody>
</table>

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

-probe

- screw-in version

- protection cap removable

- flange version

- prepared for mounting with stainless steel pipe

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

Dimensions for probe (mm / in): 1.4 (0.055) / 2.4 (0.094) / 2 (0.079) / 1.5 (0.059) / 1 (0.04)

Dimensions for protection cap (mm / in): 1 (0.04) / 2 (0.079) / 2 (0.079) / 1.5 (0.059) / 1 (0.04)
Transmitter flange for flange version

<table>
<thead>
<tr>
<th>dimensions in mm</th>
<th>size</th>
<th>DN25 / PN40</th>
<th>DN50 / PN40</th>
<th>DN80 / PN16</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>115</td>
<td>165</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>d2</td>
<td>14</td>
<td>18</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>d4</td>
<td>68</td>
<td>102</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>85</td>
<td>125</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Technical data

Suitable for LMK 382, LMK 382H, LMK 458, LMK 458H
Flange material stainless steel 1.4404 (316L)
Ordering code according to DIN 2507

Ordering type

- 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

<table>
<thead>
<tr>
<th>dimensions in mm</th>
<th>size</th>
<th>DN25 / PN40</th>
<th>DN50 / PN40</th>
<th>DN80 / PN16</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>18</td>
<td>18</td>
<td>18</td>
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</tr>
<tr>
<td>D</td>
<td>115</td>
<td>165</td>
<td>200</td>
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</tr>
<tr>
<td>d2</td>
<td>14</td>
<td>18</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>d4</td>
<td>68</td>
<td>102</td>
<td>138</td>
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<tr>
<td>f</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td></td>
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<tr>
<td>k</td>
<td>85</td>
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<tr>
<td>n</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

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)
Ordering code according to DIN 2507

Ordering type

- 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
## Ordering code LMK 458

<table>
<thead>
<tr>
<th>Pressure</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>in bar, gauge</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in bar, absolute</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in mH₂O</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Input</th>
<th>[mH₂O]</th>
<th>[bar]</th>
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<tbody>
<tr>
<td>0.4</td>
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<td>0.6</td>
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<td>1.6</td>
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<td>2</td>
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<td>4.0</td>
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<td>6.0</td>
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<td>10</td>
<td>1.0</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>1.6</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>4.0</td>
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<td>200</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>customer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Housing
- Stainless steel 1.4404 (316L)  
- Copper-nickel-alloy (CuNi10Fe1Mn)  
- Customer: consult

### Design
- Probe:  
- Flange version: consult
- Screw-in version: consult

### Diaphragm
- Ceramics Al₂O₃, 96%  
- Ceramics Al₂O₃, 99.9%  
- Customer: consult

### Output
- 4 … 20 mA / 2-wire:  
- Intrinsic safety 4 … 20 mA / 2-wire: consult
- Customer: consult

### Seals
- FKM  
- EPDM  
- FFKM  
- Customer: consult

### Electrical connection
- TPE-U-cable (blue, Ø 7.4 mm)  
- Customer: consult

### Accuracy
- Standard: 0.25 % FSO  
- Option für Pₚ ≥ 0.6 bar: 0.1 % FSO  
- Customer: consult

### Cable length
- In m: consult

### Special version
- Standard:  
- Prepared for mounting: consult
- Prepared for mounting: consult
- With stainless steel pipe: consult

---

1. Nominal pressure ranges absolute from 1 bar
2. Mounting accessories are not part of supply and have to be ordered separately
3. Min. permissible temperature from -10°C
4. Shielded cable with integrated ventilation tube for atmospheric reference
5. Not possible in combination with IS-version
6. Possible for probes in stainless steel; stainless steel pipe is not part of the supply