Cargo Level Radar (FMCW)

- Redundant ullage indication
- Completely non-contact level device
- Fully stand alone unit with local display
- Closed tank cleaning and service of all components
- Designed to operate in the roughest marine conditions
- Narrow and ultra narrow beam versions
Dimensions and weight (DN125 standard flange) 24 GHz

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th>Weight (kg)</th>
<th>Dimensions (inches)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>307</td>
<td>141</td>
<td>ø 168</td>
<td>400</td>
</tr>
</tbody>
</table>

Radar antennas

Horn antenna: Suitable for small/medium tankers with closed cleaning

Drop antenna: The construction of the drop antenna makes it ideal for sticky/contaminating liquids or dust-laden atmospheres where product build-up inside a horn antenna is likely to occur.

Lens antenna: Narrow beam. Suitable for large oil and product tankers.

Ultra narrow beam installation (DN 150) 80 GHz for narrow tanks

Footprint at different levels (height from lens to liquid surface) (mm)

<table>
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<tr>
<th>OPTIWAVE-M 7500 C Lens Antenna d 40mm Peek Beam angle ± 4°</th>
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Footprint at different levels (height from lens to liquid surface) (inch)

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The OPTIWAVE-M 7500 C 80 GHz radar keeps operating under the most difficult conditions in the tank and on the deck. The beam of ±2° makes it easy to install even on narrow tanks.

The OPTIWAVE-M 7500 C 80 GHz radar is the ideal choice for measuring ullage on tankers and marine applications, from the smallest up to the largest tanks.
<table>
<thead>
<tr>
<th><strong>Measuring system</strong></th>
<th><strong>OPTIWAVE-M 7400 C 24 GHz</strong></th>
<th><strong>OPTIWAVE-M 7500 C 80 GHz</strong></th>
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<td>Measuring principle</td>
<td>Frequency Modulated Continuous Wave (FMCW), 24 GHz</td>
<td>Frequency Modulated Continuous Wave (FMCW), 80 GHz</td>
</tr>
<tr>
<td>Application range</td>
<td>Level measurement of liquids, pastes, slurries and solids</td>
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<td>Measuring range</td>
<td>0...40 m / 0-132 ft</td>
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</tr>
<tr>
<td>Beam angle</td>
<td>± 4°</td>
<td>± 2° / ± 4°</td>
</tr>
</tbody>
</table>

**Measuring accuracy**

- **Accuracy** (at reference conditions): up to 20 m / 66 ft < 2 mm / 0.08”
  20...40 m / 66...132 ft ± 0.01% of distance
- **Repeatability**: ε 0.5 x error of measurement
- **Measured value resolution**: 0.1 mm / 0.04”

**Ambient conditions**

- **Hazardous locations**: Intrinsically safe, zone 0, 1, 2
  Temperature classes: T6...T3
  Explosion groups: IIA...IIC
- **Ambient temperature**: -40...+70°C / -40...+160°F (signal converter)
- **Flange temperature**: -40...+200°C / -40...+390°F
  optional -60...+250°C / -75...+480°F
- **Ingress protection**: IP 66 and IP 67 (signal converter)

**Product conditions**

- **Dielectric constant (εᵣ)**: Down to 1.5
- **Product limitations**: Liquid ammonia (NH₃), Liquid hydrogen (H₂), Liquid helium (He), LNG (due to CT requirements)
- **Process temperature**: Unrestricted (but observe ambient and flange temperatures)

**Materials**

- **Signal converter**: Stainless steel 316L
- **Flange system**: Stainless steel 316L (1.4404) (standard) or higher Molybden (Mo) on request
- **Horn Antenna**: Stainless steel 316L (1.4404) (standard) or higher Molybden (Mo) on request
- **Bulb Antenna**: PP or PTFE
- **Lens Antenna**: N/A
- **Gaskets**: FPM (Viton), Kalrez 6375 (others optional)
- **Process connection**: DIN 2501 DN 125 / PN 16 (standard)

**Power supply and output**

- **Powered by**: 4-20 mA (Loop power, 2 wired)
- **Protocols**: HART®
- **Current output**: 4-20 mA passive

**Certificates and approvals**

- **Ex approvals**: Intrinsically safe according to ATEX and IEC
- **IACS approvals**: DNV, ABS, GL, LR, BV, CCS, NK, RINA, KR
The OPTIWAVE Cargo Level Radars are highly accurate and reliable instruments for measuring the ullage/level. With heavy duty stainless steel housing, they are designed to withstand the roughest conditions on deck. Well protected by a stainless steel cover, they carry a backup display for redundant indication. Cargo operations may continue with a man on deck, if level information is lost on the main monitoring station.

Redundant level indication
- Fully stand alone radar
- Redundant display
  Ullage/level will always be shown locally

Closed cleaning of lens/horn antenna
- Connect cleaning hose to quick coupling on ball valve
- Tank remains closed during all cleaning

Replacement of OPTIWAVE-M 7400 C
- The radar head can be replaced without opening the tank and releasing tank vapours
- Replacement can be done at any time, even during cargo operations.

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