OPTIFLEX 1300 C
Guided Radar (TDR) Level Meter
for distance, level and volume
of liquids, liquid interface, pastes and solids

Designed to satisfy better
tan any other TDR

For all applications

No interface too thin
Measures any product in any application
Most stable measurement

Setup-Wizard
easier than ever before

Subject to change without notice.
OPTIFLEX
works better than any guided radar ever before
In contrast to earlier guided radar devices, the new OPTIFLEX with its more advanced design solutions has higher signal dynamics. Sharper pulses measure thinner interfaces. The very good time base stability allows better reproducibility, which translates to better trustability.

OPTIFLEX
makes level gauging easier than ever before
Wizard works wonders
Setting up a 2-wire level gauge couldn't be easier:
Simply fit the gauge to the tank, wire it up and switch it on:

Step 1 - OPTIFLEX tests itself to make sure its electronics are working perfectly.
Step 2 - OPTIFLEX Wizard walks you through a simple series of questions to define your tank and the product you want to measure.
(Step 3) - That's all you need. Your OPTIFLEX is already measuring.

Online help
Not certain what to do? You don't need a handbook. Simply wait 10 seconds, the help screen will appear and tell you what to do.

Process control
The easy-to-understand DTM screens make process setup, process analysis and also process control easier than with any other device.
### Technical data

**Input**
- **Function**: Time Domain Reflectometry (TDR)
- **Parameter**: Level, distance, volume and/or interface
- **Max. measuring range**:
  - Double rod 0.3” / Ø8 mm: 13 ft / 4 m
  - Single rod 0.3” / Ø8 mm: 13 ft / 4 m
  - Coaxial 0.9” / Ø22 mm: 20 ft / 6 m
  - Double cable 0.15” / Ø4 mm: 115 ft / 35 m
  - Single cable 0.15” / Ø4 mm: 115 ft / 35 m
  - Single cable 0.3” / Ø8 mm: 115 ft / 35 m

**Output**
- **Output signal**:
  - Output 1: 4 ... 20 mA HART® or 3.8 ... 20.5 mA acc. to NAMUR NE 43
  - Output 2 (option): 4 ... 20 mA (no HART® signal) or 3.8 ... 20.5 mA acc. to NAMUR NE 43
- **Accuracy**: 0.05% (rel. 20 mA; 20°C / 70°F)
- **Resolution**: ±2 µA
- **Temperature drift**: Typically ±50 ppm/K
- **Error signal**: High: 22 mA; Low: 3.6 mA acc. to NAMUR NE 43
- **Max. Load**: 350 ohm

**Measuring accuracy**
- **Reference conditions**:
  - Temperature: +20°C ±5°C / +68°F ± 9°F
  - Pressure: 1013 mbar abs. ±20 mbar / 14.69 psig ±0.29 psig
  - Relative air humidity: 60% ±15%
  - Resolution: ±0.1 mm / ±0.04”
- **Accuracy (in direct mode)**:
  - Liquids: ±3 mm / ±0.12”, when L < 10 m / 33 ft; ±0.03% of measured distance, if L > 10 m / 33 ft
  - Powders: ±20 mm / ±0.8”
  - Interface: ±10 mm (εr constant)

**Application conditions**
- **Temperature**:
  - Ambient temperature: -40...+80°C / -40...+175°F; Ex: -40...+60°C / -40...+140°F
  - Storage temperature: -40...+85°C / -40...+185°F
  - Flange temperature: -40...+150°C / -40...+300°F (Ex: refer to relevant device’s approval and temperature class)
- **Thermal shock resistance**: 100°C / min
- **Process conditions**:
  - Operating pressure: -1...40 bar / -14.5...580 psig; subject to process connection used and flange temperature
  - Dielectric constant: In direct mode: ≥1.4 for coaxial probe; ≥1.6 for single and double probes
- **Vibration resistance**: ±100g
- **Protection category**: IEC 66-2-6 and prEN 50178

**Mechanical data**
- **Material**:
  - Housing: Aluminium
  - Single rod: Stainless steel (1.4404 / 316 L); Hastelloy C-22 (2.4602)
  - Double rod: Stainless steel (1.4404 / 316 L); Hastelloy C-22 (2.4602)
  - Coaxial: Stainless steel (1.4404 / 316 L); Hastelloy C-22 (2.4602)
  - Single cable: Stainless steel (1.4401 / 316 L); Hastelloy C-22 (2.4602)
  - Double cable: Stainless steel (1.4401 / 316 L)
  - Gaskets: Viton (-40…+150°C / -40...+300°F); Kalrez 6375 (-20…+150°C / -5 ...+300°F)
- **Process fitting**:
  - Thread: G 3/4…1 1/2; 3/4…1 1/2 NPT
  - Flange: DN 25…DN 150 (PN 40 / PN 16); 1”…8” (150 lb / 300 lb); 10 K (40…100A)

**Electrical connection**
- **2-wire power supply**:
  - Terminals output 1
    - Non-Ex/ EEEx i: 24 V DC (14...30 V DC)
    - EEEx d: 24 V DC (20...36 V DC)
  - Terminals output 2
    - Non-Ex/ EEEx i: 24 V DC (10...30 V DC)
    - EEEx d: 24 V DC (10...30 V DC)

**Human machine interface**
- **Display**: 9 lines, 160x160 pixels in 8-step grey scale with 4-button keypad
- **Operating languages**: English (UK), German, French, Italian, Spanish, Portuguese, Japanese, Chinese (Mandarin), Russian

**Approvals**
- **Overfill protection**: WHG
- **ATEX**
  - ATEX II G/D 1, 1/2, 2 EEEx ia IIC T6...T1; ATEX II G/D 1/2, 2 EEEx d ia IIC T6...T1
- **FM / CSA**
  - XP / IS Class I, II, III Div. 1, Nl Div. 2 Group A...G except CSA Group B...G
  - Class I Zone 0 EEEx d ia IIC
- **FM**
  - Class I Zone 0 GR IIC
- **CSA**
  - Class I Zone 0 EEEx d ia IIC
OPTIFLEX 1300 C

Dimensions

Flange
DN 25 ... DN 150
ANSI 1" ... 6"

Flange connection ANSI 1" ... 6"
Flange connection ANSI 4" ... 8" / DN 100 ... 150
Thread connection
Probes

Single cable
ø 0.15" / ø 4 mm
ø 0.3" / ø 8 mm

Double cable
ø 0.15" / ø 4 mm

Single rod
ø 0.3" / ø 8 mm

Double rod
ø 0.3" / ø 8 mm

Coaxial
ø 0.9" / ø 22 mm

Coaxial 0.9" / ø 22 mm

Dimensions in inches and mm

Note:
Cable glands are delivered with non-Ex, EEx i and EEx d approved devices. Non-Ex and EEx i fittings are plastic and EEx d fittings are metal. Non-Ex fittings are black and EEx i fittings are blue. The diameter of the outer sheath of the cable must be 0.2...0.5" or 6...12 mm. Cable glands for FM/CSA approved devices must be supplied by the customer.

Weights

<table>
<thead>
<tr>
<th>Housing and Connection (Stainless steel 316)</th>
<th>[lb]</th>
<th>[kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>7.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Flange connection ANSI 1&quot; ... 3&quot; / DN 25...80</td>
<td>8.8...15.4</td>
<td>4...7</td>
</tr>
<tr>
<td>Flange connection ANSI 4&quot; ... 8&quot; / DN 100...150</td>
<td>15.4...26.5</td>
<td>7...12</td>
</tr>
<tr>
<td>Thread connection</td>
<td>6.6</td>
<td>3</td>
</tr>
<tr>
<td>Probes [lb / ft]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single cable 0.15&quot; / Ø 4 mm</td>
<td>0.08</td>
<td>0.12</td>
</tr>
<tr>
<td>Single cable 0.3&quot; / Ø 8 mm</td>
<td>0.28</td>
<td>0.41</td>
</tr>
<tr>
<td>Double cable 0.15&quot; / Ø 4 mm</td>
<td>0.16</td>
<td>0.24</td>
</tr>
<tr>
<td>Single rod 0.3&quot; / Ø 8 mm</td>
<td>0.28</td>
<td>0.41</td>
</tr>
<tr>
<td>Double rod 0.3&quot; / Ø 8 mm</td>
<td>0.56</td>
<td>0.82</td>
</tr>
<tr>
<td>Coaxial 0.9&quot; / Ø 22 mm</td>
<td>0.53</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Note:
Wide range of counterweights and anchoring solutions available.
Contact KROHNE for further information.

* Only single cable Ø 0.3" / Ø 8 mm (solids application)
### Measurement limits

<table>
<thead>
<tr>
<th>Probes</th>
<th>Top dead zone $\varepsilon r=80^\circ$ [inch / mm]</th>
<th>Bottom dead zone $\varepsilon r=80^\circ$ [inch / mm]</th>
<th>Top dead zone $\varepsilon r=2.3^\circ$ [inch / mm]</th>
<th>Bottom dead zone $\varepsilon r=2.3^\circ$ [inch / mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double rod</td>
<td>4.9 / 125</td>
<td>0.4 / 10</td>
<td>6.5 / 165</td>
<td>1.95 / 50</td>
</tr>
<tr>
<td>Single rod</td>
<td>7.9 / 200</td>
<td>0.4 / 10</td>
<td>9.9 / 250</td>
<td>1.95 / 50</td>
</tr>
<tr>
<td>Coaxial</td>
<td>0.4 / 10</td>
<td>0.4 / 10</td>
<td>0.4 / 10</td>
<td>1.95 / 50</td>
</tr>
<tr>
<td>Double cable</td>
<td>4.9 / 125</td>
<td>0.4 / 10</td>
<td>6.5 / 165</td>
<td>1.95 / 50</td>
</tr>
<tr>
<td>Single cable Ø0.3&quot;/8 mm</td>
<td>7.9 / 200</td>
<td>0.4 / 10</td>
<td>9.9 / 250</td>
<td>1.95 / 50</td>
</tr>
<tr>
<td>Single cable Ø0.15&quot;/4 mm</td>
<td>7.9 / 200</td>
<td>0.4 / 10</td>
<td>9.9 / 250</td>
<td>1.95 / 50</td>
</tr>
</tbody>
</table>

*80 is εr of water; 2.3 is εr of oil*

### Probe selection

- **A1, Top dead zone**
  - Min. distance from flange to top limit of measuring range.

- **A2, Bottom dead zone**
  - Length at end of probe, where measurement is not possible.

- **D, non measurement zone**
  - Zone where measurement cannot be taken.

- **L, Probe length**
  - Length specified by customer in the order.

### Maximum tank height

- 13 ft / 4 m
- 20 ft / 6 m
- 115 ft / 35 m

### Liquids

- Liquid application
- LPG, LNG
- Highly viscous liquids
- Highly crystallizing liquids
- Highly corrosive liquids
- Foam
- Agitated liquids
- Spray in tank
- Storage tanks
- Installation in bypass chamber
- Small diameter nozzles
- Long nozzles
- Stilling wells
- Interface measurement

* with anchor fitting
Electrical connection

Output 1
4 ... 20 mA/HART
or
3.8 ... 20.5 mA/HART
acc. to NAMUR NE 43

Output 2 (Option)
4 ... 20 mA
or
3.8 ... 20.5 mA
acc. to NAMUR NE 43

Non-Ex

Explosion Proof (XP) / Ex d

Intrinsically Safe (IS) / Ex i

Note: Other options how to connect the HHCC (Hand Held Communicator) and modem to the HART® loop are available.
**OPTIFLEX 1300 C**

State-of-the-art with PACTware

OPTIFLEX is PACTware-ready. Each device is supplied ex-factory with the appropriate DTM.

A DTM (Device Type Manager) is a device driver making available the device functionality independent from the FIELDBUS protocol and providing a graphical user interface optimized for device operation and configuration.

Simple on-screen and intuitive setup procedure for devices without a display, or for set up from the Central Control Room. Summarized setup provides perfect control of initial input, and a guarantee perfect results.

All features of PACTware are fully supported:

- Online device setup
- Displays measured values
- Records measured information during operation
- Shows status of device
- Interactive programming menu with data validity checking
- Displays summary of setup selection for final supervision