CT-1000 Series

Potentiometric Level Sensors

- Suitable in all electrically conductive liquids
- Resolution better than ±1mm (0.039")
- Micro-controlled measurement analysis
- 2-wire terminal (4-20mA)
- Measuring result independent of pressure, temperature and density
- Filling level or separating layer coverage
- Very short measuring times
- Hart protocol version 6.0
- Temperature range up to 200°C (390°F)
- Pressure up to 150 bar (2,175 PSI)—at room temperature
- Lengths from 0.2 to 6 meters (8" to 19.7")

The high precision and robust level sensor is designed for use in continuous filling level measurement or continuous separating layer coverage. It is suitable for all electrically conductive liquids.

Specifications

<table>
<thead>
<tr>
<th>Housing</th>
<th>Protection Type</th>
<th>IP 68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless Steel (Options: Hastelloy®, Tantalum, Titanium)</td>
<td></td>
</tr>
<tr>
<td>Cable Diameter</td>
<td>5 to 10 mm (0.2&quot; to 0.4&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

| Probe Tube | Diameter | 6 mm (0.236") |
| Material | Stainless Steel - 316 Ti |
| Length | 0.2m to 6m (8" to 19.7") |
| Pressure Range | 150 bar (2175 PSI) @ 20°C (68°F) |
| Temperature | Ambient: -25°C to +80°C (-13°F to +176°F) |
| Process | Normal Temp: -40° to 125°C (-40° to 257°F) |

Electrical

- Connection: 2-wire
- Supply: 10 to 30 VDC
- Current Signal: 4 to 20 mA
- Error Message: Adjustable to 3.6 or 21.5 mA

Measuring Accuracy

- Linearity: ±1%
- Filling Level: Better than 1mm (±0.039")
- Resolution: < 0.1mm (0.004")
- Analog Part: ±0.1% (20°C) + 0.005%/°K

Interfaces

- 4-20 mA (2-wire technology)
- HART Communication Protocol
- USB

Notes:

1. Please contact Gems for alternate housing materials.
2. High temperature version (to 200°C / 392°F) available. Please contact Gems.

Operating Principle

The sensor works according to the potentiometric measuring principle. By means of the micro-controlled sensor electronics the current impulses are transmitted through the sensor electrode which is electrically insulated from the tank or external tube. This leads to a linear voltage drop on its electrical resistance. If the sensor electrode is dipped into a conductive liquid (≥1 µS/cm) an electrical connection to the environment is created. The electrical potential is proportional to the filling level and is measured via a counterelectrode or the tank wall. In order for the input resistance of the measuring electronics to be big enough compared to the electrical resistance of the medium the conductivity of the liquids has to be ≥1 µS/cm.
### Level Sensors – Continuous


**Dimensions – mm (in.)**

#### Threaded

- **Probe Length**: 8-236 inches or 200-6000 millimeters, and may be specified in either unit. Label with "in" when using inches, or with "mm" when using millimeters.

  - Length Ordering Code Examples:
    12 inches = 12in; 125 inches = 125in
    2830 millimeters = 2830mm; 350 millimeters = 350mm

  - **Rod Type**:
    - 0 - 1 Rod
    - 1 - 2 Rods (for non-conductive tanks)

  - **Mounting Type**:
    - 2 - 2" NPT Threaded, 316 Stainless Steel
    - 3 - 3" 150# Flange, 316 Stainless Steel
    - 4 - R 3/4" Threaded, 316 Stainless Steel
    - 5 - R 1/2" Threaded, 316 Stainless Steel
    - 6 - R 1" Threaded, 316 Stainless Steel

  - **HART**:
    - 0 - None
    - 1 - HART Protocol

  - **Options**:
    - 001 - Cable Gland
    - 002 - 1/2" NPT Conduit Adapter

#### Flange

- **Probe Length**: 8-236 inches or 200-6000 millimeters, and may be specified in either unit. Label with "in" when using inches, or with "mm" when using millimeters.

  - Length Ordering Code Examples:
    12 inches = 12in; 125 inches = 125in
    2830 millimeters = 2830mm; 350 millimeters = 350mm

  - **Rod Type**:
    - 0 - 1 Rod
    - 1 - 2 Rods (for non-conductive tanks)

  - **Mounting Type**:
    - 2 - 2" NPT Threaded, 316 Stainless Steel
    - 3 - 3" 150# Flange, 316 Stainless Steel
    - 4 - R 3/4" Threaded, 316 Stainless Steel
    - 5 - R 1/2" Threaded, 316 Stainless Steel
    - 6 - R 1" Threaded, 316 Stainless Steel

  - **HART**:
    - 0 - None
    - 1 - HART Protocol

  - **Options**:
    - 001 - Cable Gland
    - 002 - 1/2" NPT Conduit Adapter

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**Mounting Types**

<table>
<thead>
<tr>
<th>Size</th>
<th>Material</th>
<th>Mounting Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2” NPT</td>
<td>316 Stainless Steel</td>
<td>Threaded</td>
<td>2</td>
</tr>
<tr>
<td>3” - 150# ANSI</td>
<td></td>
<td>Threaded</td>
<td>3</td>
</tr>
<tr>
<td>R 3/4&quot;</td>
<td></td>
<td>Threaded</td>
<td>4</td>
</tr>
<tr>
<td>R 1/2”</td>
<td></td>
<td>Threaded</td>
<td>5</td>
</tr>
<tr>
<td>R 1”</td>
<td></td>
<td>Threaded</td>
<td>6</td>
</tr>
</tbody>
</table>

**How to Order**

Use the **bold** characters from the chart below to construct a product code:

**CT-1000 - 0 - XXXX - X - X - 1 - 0 - X - XXX**