

# CT-1000 Series

## Potentiometric Level Sensors

- ▶ Suitable in all electrically conductive liquids
- ▶ Resolution better than  $\pm 0.039$  (1mm)
- ▶ 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 390°F (200°C)
- ▶ Pressure up to 2,175 PSI (150 bar)—at room temperature
- ▶ Lengths from 8" to 19.7' (up to 6 meters)

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

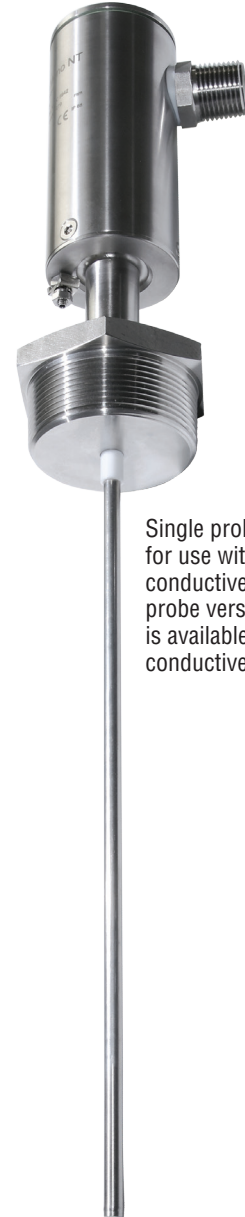
|                           |  |
|---------------------------|--|
| <b>Housing</b>            |  |
| <b>Protection Type</b>    | IP 68  |
| <b>Material</b>           | Stainless Steel (Options: Hastelloy®, Tantalum, Titanium) <sup>1</sup> |
| <b>Cable Diameter</b>     | 0.2" to 0.4" (5 to 10 mm)  |
| <b>Probe Tube</b>         |  |
| <b>Diameter</b>           | 0.236" (6 mm)  |
| <b>Material</b>           | Stainless Steel - 316 TI   |
| <b>Length</b>             | 8" to 19.7' (0.2m to 6m)   |
| <b>Pressure Range</b>     | 2175 PSI (150 bar) @ 68°F (20°C)<br>362 PSI (25 bar) @ 302°F (150°C)   |
| <b>Temperature</b>        |  |
| <b>Ambient</b>            | -13°F to +176°F (-25°C to +80°C)                                       |
| <b>Process</b>            | Normal Temp: -40° to 257°F (-40° to 125°C) <sup>2</sup>                |
| <b>Electrical</b>         |  |
| <b>Connection</b>         | 2-wire   |
| <b>Supply</b>             | 10 to 30 VDC   |
| <b>Current Signal</b>     | 4 to 20 mA   |
| <b>Error Message</b>      | Adjustable to 3.6 or 21.5 mA   |
| <b>Measuring Accuracy</b> |  |
| <b>Linearity</b>          | $\pm 1\%$  |
| <b>Filling Level</b>      | Better than $\pm 0.039$ " (1mm)  |
| <b>Resolution</b>         | < 0.004" (0.1mm)   |
| <b>Analog Part</b>        | $\pm 0.1\%$ (20°C) + 0.005% / °K                                       |
| <b>Interfaces</b>         |  |
|                           | 4-20 mA (2-wire technology)<br>HART Communication Protocol<br>USB      |

Notes:

1. Please contact Gems for alternate housing materials.
2. High temperature version (to 392°F / 200°C) 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 ( $\geq 1 \mu\text{S/cm}$ ) 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  $\geq 1 \mu\text{S/cm}$ .



Single probe version for use with electrically-conductive tanks. A dual probe version (not shown) is available for non-conductive tanks.