

# 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

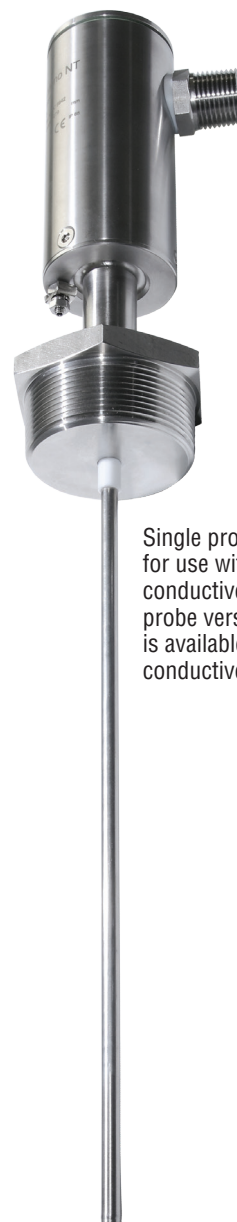
<b>Housing</b>	
Protection Type	IP 68
Material	Stainless Steel (Options: Hastelloy®, Tantalum, Titanium) <sup>1</sup>
Cable Diameter	0.2" to 0.4" (5 to 10 mm)
<b>Probe Tube</b>	
Diameter	0.236" (6 mm)
Material	Stainless Steel - 316 TI
Length	8" to 19.7' (0.2m to 6m)
Pressure Range	2175 PSI (150 bar)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



*Specialists in Valves, Controls,  
Pneumatics, Fluid Measurement*

# CAP-200 Series – Compact, 1/2" NPT Mount

- ▶ For metallic and non-metallic containers
- ▶ Food grade plastic housing
- ▶ No sensor well required
- ▶ Potentiometer for sensitivity adjustment

The CAP-200 Series is easily threaded directly into 1/2" NPT fittings for an easy level sensing solution within a wide variety of metal and non-metal tanks. The highly accurate sensor is built from durable Delrin® material, and is available in both aqueous and non-aqueous versions. The easy to calibrate sensor can be delivered with factory preset sensitivity for quick installation by OEM.

## Specifications

Performance	
Nominal Sensing Distance, Sn	0.39" (10mm)
Sensing Range	0-0.39" (0-10mm)
Repeat Accuracy - (% of Sn)	<10%
Hysteresis - (% of Sn)	<20%
Mechanical	
Enclosure Ratings	IP67, NEMA 1,3,4,6,13
Operating Temperature Range	-13°F to +158°F (-25°C to +70°C)
LED Signal Indicator	Yellow
Power On LED Indicator	Green
Potentiometer	Yes
Sensor Type	
Unshielded	L-Type, Non-Embeddable
Shielded	D-Type, Embeddable
Barrel Material	Delrin®
Termination	78.74" (2 meter), 3 Wire PVC
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude in all planes
Electrical	
Supply Voltage	10-48 VDC
Continuous Switching Current	300 mA
Voltage Drop	<2 VDC
Current Consumption	<10 mA
Switching Frequency	100 Hz
Transient Protection	2kV, 1ms, 1 kOhm
Overload Protection	Yes
Short Circuit	Yes
Reverse Polarity Protection	Yes
Approvals	CE

## How To Order

Select a Part Number based on Fluid Properties and Sink State.

Fluid Properties	Min. Container Wall Thickness	Container Material	Wet/Dry Sink	Part Number
Water Based, Conductive (unshielded sensor)	5/8"	Non-Metallic	N.O. Wet	230077
			N.C. Dry	230078
Non-Water Based, Not Conductive (shielded sensor)	3/8"	Non-Metallic or Metallic	N.O. Wet	230082
			N.C. Dry	230083

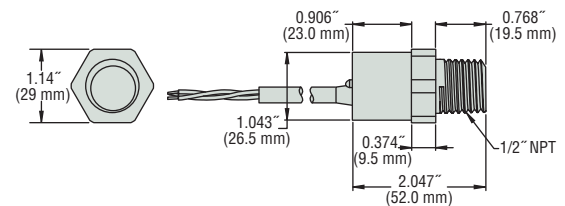


## Typical Applications

Fluid Monitoring:

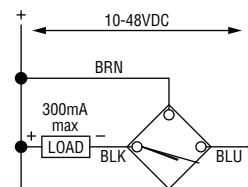
- Waste
- Reagents
- Diluent
- Detergent/Wash
- Coolant
- Printing Ink

## Dimensions

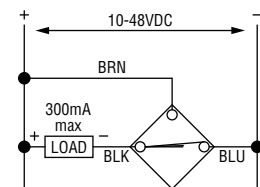


## Wiring Diagram

Normally Open



Normally Closed



LEVEL SWITCHES – SINGLE POINT

O'Keefe Controls Co.

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