

# RF CAPACITANCE POINT LEVEL SENSORS

## LV800 Series



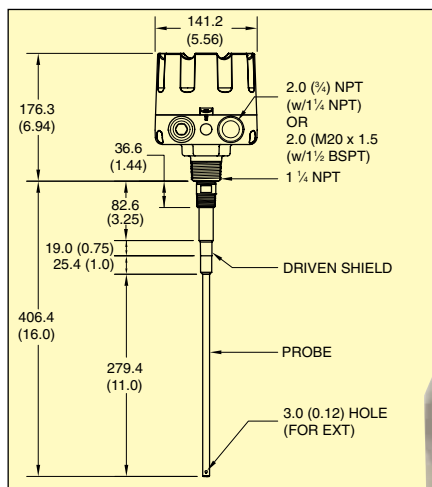
- ✓ Superior 0.5 pF Sensitivity Ensures Reliability
- ✓ Build-Up Immunity Helps Eliminate False Signals
- ✓ High Intensity LED Indicating Light (Ordinary Location Integral Sensors Only)
- ✓ Simple 2-Step Manual Calibration

LV800 Series RF capacitance sensors offer cost-effective point level monitoring with reliability you can count on. Omega® provides you with the most affordable solution for your application. Omega's RF capacitance probes are designed to provide a high level of sensitivity, stability and durability for powder and bulk solids applications, as well as liquid and slurry applications.

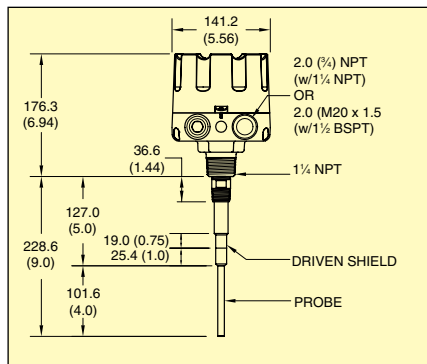
### Principal of Operation

A radio frequency is applied to the probe and is continually analyzed to determine the influence caused by the surrounding environment. As material contacts the probe, the radio frequency shifts indicating an increase in capacitance (C). The active probe of the unit and the vessel's wall make up the 2 plates, (A) of a capacitor which are separated by a fixed distance (D). The probe's insulator and surrounding air provide the dielectric material [with dielectric constant (K)]. As the air (K=1.0) is displaced with any other material (K > 1.0), the capacitance effect (C) is enhanced, thereby changing the application's impedance. This influence is measured within the circuitry and compared to a reference established by the sensitivity setting. The setting determines how much influence must be present before the output changes. The driven shield section of the probe enables the circuitry to ignore product build-up on the probe that would otherwise cause false sensing. The

driven shield is activated with the same radio frequency potential as the sensing probe. Since current can not flow between identical potentials, the driven shield blocks current flow from the active probe to the vessel wall through the material build-up, thereby eliminating the sensing of the material build-up.



LV801 Dimensions: mm (inch)



LV802 Dimensions: mm (inch)



LV801, shown smaller than actual size.

SENSITIVITY SETTING OF THE LV800			
SENSITIVITY DESCRIPTION	NO. OF ADJ. TURNS	MATERIAL DIELECTRICS	TYPICAL APPLICATIONS
HIGH	0 to 1	1.5 to 3.0	PLASTICS, SOAP, OILS RUBBER, CEMENT
MED	1 to 3	3.0 to 9.0	GRAINS, FERTILIZERS, FEED, SALT
LOW	> 3.0	> 9.0	WASTEWATER, SLURRIES ANY WATER BASED SOLUTIONS

## Applications

LV800 Series capacitance point level sensors are versatile devices providing high and low level readings in bins, silos, tanks, hoppers, and other vessels. LV800 Series superior sensitivity range allows users to properly adjust units to meet the needs of a wide variety of applications. Whether your application is for a powder, liquid, granular solid, or viscous material, the LV800 Series product line offers the right solution.

Typical Applications include, but not limited to		
Chemicals	Plastics	Pellets
Feed/Grain	Rubber	Pharmaceuticals
Liquids	Wastewater	Sand
Food Ingredients	Slurries	Cement
Powders	Paint and Coatings	Coal
Granular Solids	Oils	Paper Pulp

Specifications for LV800 Series	
<b>Power</b>	115 Vac ( $\pm 15\%$ ), 2.5 VA, 50/60 Hz, or 230 Vac ( $\pm 15\%$ ), 2.5 VA, 50/60 Hz (depending on model)
<b>Altitude</b>	2000 m (6562') maximum
<b>Installation Category</b>	II
<b>Pollution Degree</b>	4 (reduced to 2 by enclosure) suitable for indoor/outdoor use
<b>Ambient Operating Temperature</b>	-40°C (-40°F) to 65°C (150°F)
<b>Internal Bin Temperature*</b>	To 80°C (176°F) with aluminum mount [ $< 40^\circ\text{C}$ (104°F) ambient]
<b>Output Relay</b>	SPDT, 5A @ 250 Vac, 30 Vdc maximum
<b>External Indicators</b>	Red and green LEDs indicating power and operating mode (ordinary location units only)
<b>Sensitivity</b>	Multi-turn potentiometer adjustment 0.5 pf to 150 pf
<b>Stability</b>	$\pm 0.027$ pf per °C ( $\pm 0.015$ pf per °F) @ 0.5 pf setting
<b>Time Delay</b>	0.25 to 15 sec delay-to-activate, adjustable 0.25 sec delay-to-deactivate, fixed
<b>Fail-Safe</b>	Switch selectable - HI/LO
<b>Build-Up Immunity</b>	Protected via driven shield to 150 $\Omega$ load
<b>Enclosure</b>	Cast aluminum screw-on cover, beige polyester powder coat, NEMA 4 (IP66)
<b>Conduit Connection</b>	Two (2) $\frac{3}{4}$ NPT connections
<b>Approvals</b>	CSA(US) CSA(C) ordinary locations, CE mark (ordinary location only)

\* Influenced by mounting, material thermal conductivity and ambient temperature.

## Probe Specifications

Standard or Food Grade Probe	
<b>Mounting</b>	1 $\frac{1}{4}$ NPT aluminum
<b>Probe Material</b>	9.5 mm ( $\frac{3}{8}$ ") dia. 316 SS probe and guard, PPS and nylon insulators
<b>Probe Length</b>	406 mm (16") from aluminum mounting
<b>Temperature (Probe Only)</b>	PPS: 232°C (450°F) maximum, nylon: 148°C (300°F) maximum
<b>Pressure</b>	3.5 bar (50 psi) maximum (aluminum connection), 10 bar (150 psi) maximum ( $\frac{3}{4}$ NPT SS)
Stub Probe (LV802)	
<b>Mounting</b>	1 $\frac{1}{4}$ NPT aluminum
<b>Probe Material</b>	9.5 mm ( $\frac{3}{8}$ ") dia. 316 SS probe and guard, PPS
<b>Probe Length</b>	228.6 mm (9")
<b>Temperature (Probe Only)</b>	PPS 232°C (450°F) maximum
<b>Pressure</b>	3.5 bar (50 psi) maximum (aluminum connection)

## To Order

Model No.	Probe Type	Power	Probe Connection
<b>LV801</b>	40 cm (16") PPS	115 Vac	1 $\frac{1}{4}$ NPT AI
<b>LV802</b>	23 cm (9") PPS	115 Vac	1 $\frac{1}{4}$ NPT AI
<b>LV803</b>	40 cm (16") PPS	230 Vac	1 $\frac{1}{4}$ NPT AI
<b>LV804</b>	40 cm (16") food grade nylon	115 Vac	1 $\frac{1}{4}$ NPT AI
<b>LV805</b>	40 cm (16") PPS	115 Vac	1 $\frac{1}{4}$ and $\frac{3}{4}$ NPT stainless steel

Comes complete with operator's manual.

**Ordering Examples:** LV801, 40 cm (16") PPS probe, 115 Vac, 1 $\frac{1}{4}$  NPT AI connection.

LV804, 40 cm (16") food grade nylon probe, 115 Vac, 1 $\frac{1}{4}$  NPT AI connection.