

Model 9400 Guided Wave Radar Level Sensor

The 9400 series guided wave radar level transmitter (“Model 9400”) is a breakthrough in cost effective very high accuracy, very high-resolution liquid level sensing for heavy duty applications.

Rochester Gauges Model 9400 liquid level sensor is used to monitor liquids such as fuels, chemicals, water, coolants, lubricants and other materials. The sensor provides very high resolution and accuracy no matter what the liquid might be.

Unique for the industry, the sensor can be configured to accurately measure the level of different liquid interfaces (example: diesel fuel and water or foam and liquid).

The sensor is based on the measurement principles of guided wave radar and time domain reflectometry technology. Unlike capacitive measurement-based devices, knowing the dielectric constant of the material being measured is not required for the Model 9400, and the presence of water in the tank will not cause stability issues with the device.

The Model 9400 is very rugged boasting IP6K9K protection, working temperature range of -40C to +105C, and the ability to withstand extremes of shock and vibration.

Typical applications include:

- Commercial vehicles and buses
- Construction and mining machinery
- Agricultural machinery
- Mobile and stationary power generators, pumps and compressors

As depicted in the chart below, the Model 9400 has many advantages that other technologies do not and has a similar cost to ultrasonic or capacitive solutions but much cheaper than a typical guided wave radar product for process control applications.



Technology/Attribute	Cost	Resolution	Accuracy	Vibration	Fluid Compatibility	Condensation	Water Bottoms	Slosh	Dead Zone(s)	Response Time	Coating	MTBF
Thick Film	Green	Yellow	Yellow	Yellow	Red	Yellow	Red	Green	Green	Green	Yellow	Red
Reed Switch Probe	Yellow	Red	Yellow	Yellow	Green	Red	Red	Red	Yellow	Red	Yellow	Green
Ultrasonic	Yellow	Green	Yellow	Yellow	Green	Red	Red	Red	Red	Yellow	Yellow	Green
Capacitance	Yellow	Green	Red	Yellow	Green	Red	Red	Yellow	Green	Yellow	Red	Yellow
Self-Calibrating Capacitance	Red	Green	Yellow	Yellow	Green	Red	Red	Yellow	Yellow	Yellow	Red	Yellow
Magnetostrictive	Yellow	Green	Yellow	Yellow	Green	Green	Red	Yellow	Yellow	Yellow	Yellow	Yellow
GWR	↑↑↑↑↑	Green	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Green	Yellow
Rochester Gauges Model 9400	↑↑↑↑↑	Green	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Green	Yellow

See reverse side for dimensional data, materials of construction, performance, and advice on how to order.

Construction

The model 9400 is a light but very robust mechanical assembly designed for heavy duty service. The SAE 5 bolt or SAE 6 bolt mounting structure is die cast aluminum. The extruded aluminum wave guide can range in length from 15mm to 1000mm. Other constructions are available for deeper tanks.

Inputs and Outputs

The 9400 is designed to operate over an input voltage range of 9-36Vdc. Low voltage (regulated 5Vdc) options are also available. The device is capable of dropping into a deep sleep state and waking on a programmable time interval or waking on detection of bus activity. This is especially useful for situations where the system may sit for long periods of time with no activity, but periodic level measurement is required for applications like theft detection.

Various analog output options are available including voltage and PWM. An open drain type of voltage output structure can be provided to emulate a voltage drop on a resistor for replacement of thick-film or reed type devices.

Digital bus interconnection via LIN or CAN (including NEMA 2000 and SAE J1939) are also available.

The devices can also be configured with a programmable alarm output. The output is short circuit protected and suitable for up to 500mA.

Contact Rochester Gauges for more detailed information on the Rochester Gauges Model 9400.

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