

# Liquid Level Gauging Solutions

Continuous Liquid Level Monitoring Systems



**JOWA USA, Inc.**

## Level Gauging Solutions

With five decades of experience in level gauging, JOWA USA, Inc. supplies reliable level solutions to customers throughout the world. These solutions include our Metritape™ family of resistance-tape liquid level gauging products, ultrasonic level sensors, pressure transmitter level sensors and a wide range of meters, controllers and supporting instrumentation.

### Resistance-tape Technology

Today, more than 25,000 of our resistance-tape level sensors are in use worldwide. This reliable gauge is used by dozens of major airport fuel facilities, and is the principal tank gauge on many of the world's largest, most sophisticated ocean going vessels and drilling rigs. Resistance-tape level gauges are used in hundreds of municipal and industrial water and wastewater treatment facilities and are increasingly the gauge of choice for monitoring industrial chemicals and petroleum products.

### Operation Principle

The resistance-tape sensor is essentially an “electric tape measure” which converts distance along its length into resistance, measured in ohms (figure 1). The sensor's outer envelope jacket (1), is compressed by hydrostatic pressure causing the gold plated nichrome wire helix to contact the stainless steel base strip (2). The resulting resistance (3) indicates the length of active or uncontacted helix, and the distance from sensor top to liquid surface.

Resistance-tape Sensor  
Inner Element



Resistance-tape  
Operation Principle

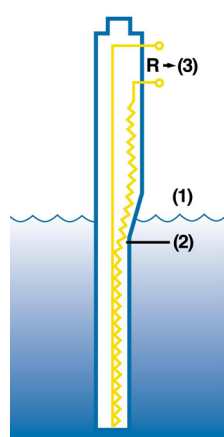


Figure 1



Aquatape™, Petrotape™, and Chemtape™ level gauges

The helix winding is gold plated nichrome, 4 turns/inch, 1000 ohms/meter (305 ohms/ft.) resistance gradient and provides 1/4" resolution.

### Resistance-Tape Simply Works

Whether your application is an individual tank, a tank farm, a reservoir, or a river, our resistance-tape level gauge provides a reliable solution. That's because resistance-tape is remarkably different from other level gauges - in principle, appearance and performance.

### Features and Benefits:

- No moving parts, nothing to wear out
- High reliability, virtually maintenance free
- Easy to install from tank-top, no need to empty the tank
- Wireless options available
- Sensor is not adversely affected by agitation, foam, vapors, or product build up
- Stable output unaffected by specific gravity
- Calibration remains stable and drift-free
- Intrinsically safe for use in flammable liquids
- Temperature detectors can be added to sensor, no additional tank penetrations

## Applications

Resistance-tape has been the solution for a wide range of level gauging applications and can meet your most demanding requirements for:

### Water and Wastewater

The resistance-tape level sensor is ideal for sumps, tanks, ponds or streams because of its high resolution, stable output and simple pipe-mount installation. Since it has no moving parts and its output is not adversely affected by specific gravity and viscosity, resistance-tape is perfect for gauging raw sewage and sludge. Hundreds of municipalities and treatment plants use these reliable sensors in diverse applications including cooling ponds, digesters, groundwater, reservoirs, raw sewage, sludge pits and wet wells.

### Slurries & Viscous Liquids

Resistance-tape has proven durability in the gauging of slurries and dense liquids. The sensor's smooth, non-mechanical design resists buildup and is unaffected by agitation. Heavy ores, syrups, viscous muds and high viscosity oils do not hinder its operation. Applications include coal slurries, drilling mud, iron ore slurries, lime slurries and pulp & paper.

## Petroleum

The chemically inert surface of the resistance-tape sensor's outer sheath is ideal for gauging waxy crudes, heavy oils and refined products. Up to three temperature detectors can be built into the Level/Temp model which carries full intrinsic safety approvals. Applications include avgas, bunker C, crude, diesel oil, fuel oil, gasoline and jet fuel.

## Chemicals

Organics, inorganics, solvents, toxic substances and chemical waste tanks have all been successfully gauged with resistance-tape level sensors. These rugged sensors can be installed, calibrated and tested without ever entering the tank. Applications include acetic acid, acetone, benzene, caustics, chromates, condensate, methanol, phenol, plating solutions, sulfuric acid, toluene and xylene.

## Product Selection

The resistance-tape product line includes Aquatape™ for water and wastewater, Petrotape™ for petroleum and fuel, Chemtape™ for chemicals and petrochemicals and the LA Series sensors for higher temperatures and pressures. Resistance-tape's linear, stable output is easily converted using a loop powered 4-20mA transmitter.

## Resistance-tape Selection Matrix

SERVICE	MODEL	WETTED MATERIALS	HOUSING	LEVEL RANGE	TEMPERATURE RANGE
Water, Wastewater, Sewage	Aquatape	Polypropylene, Glass-filled Polypropylene, and Stainless Steel	6" x 6" x 6" PVC	3 - 50 feet	5 to 140°F (-15 to 60°C)
Crude Oil, Petroleum Products	Petrotape	Hastelloy™ C276, Nylon 12, and Stainless Steel	8" x 8" x 7" 304 Stainless Steel	3 - 100 feet	5 to 225°F (-15 to 107°C)
Chemicals	Chemtape	Hastelloy™ C276, Glass-filled Polypropylene, and Stainless Steel	8" x 8" x 7" 304 Stainless Steel	3 - 100 feet	5 to 225°F (-15 to 107°C)

All Models are FM approved for Hazardous Environments, include a 4-20mA transmitter and have options to add temperature detection.



## Installation

These level gauges are easily installed from tank top by dispensing the flexible sensor from its reel into a customer supplied still pipe of PVC or steel. For some non-agitated tanks, a specially weighted sensor can be used without a stillpipe.



Flexible resistance-tape sensors are easily installed from tank top



Resistance-tape level sensors are unaffected by agitation or foam

## JOWA USA has the solution to your level gauging needs

### Level Gauging

Resistance-tape  
Pressure Cells

### Displays

Panel Mount with Relays  
Loop Powered I.S. and XP  
NEMA 4 and 4X

### Controllers

Duplex Pump Controller  
Multi-channel Displays

### **Other Markets**

JOWA USA provides level monitoring equipment to a wide range of industries. For over 50 years Marine customers have relied on our rugged resistance-tape technology and monitoring equipment for their Tankers, Barges, Container Ships and Drill Rigs.

### **Together with our parent company, JOWA AB, we also offer the following products:**

Silver Ion Water Treatment System  
UV Water Sterilization  
ODME 2005 Oil Discharge Monitor  
Watermaker - Reverse Osmosis

Oily Water Separators  
Homogenizer System  
Propeller Shaft Earthing System  
Hydrophore & Calorifier

### **Industrial Guarantee**

If within 30 days of delivery of the product, the product does not perform in accordance with our published specifications, when installed in compliance with our requirements in an application within our performance specifications, the product may be returned to JOWA USA, Inc. Littleton, MA, freight prepaid, for full credit of the purchase price with the prior authorization of JOWA USA, Inc.



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