



# TPI 390 Digital Salt/TDS-Meter

## Operation Manual



### **1. Before Use**

- Please carefully read the Operators Manual before using this meter.
- Clean the sensor area with a neutral detergent using a soft cloth or sponge before and after use.

### **2. Description**

- The 390 measures the concentration of dissolved NaCl/TDS in liquids.
- Simply immerse the tip into liquids to determine the NaCl/TDS content and temperature.

### **3. Applications**

**Water** – Test TDS levels to determine purity.

**Food** – Test the amount of salt in food, seafood, or processed foods.

**Health** – Monitor the amount of salt intake.

**Water Filtration** – Test for TDS to determine performance level of filtration systems.

**Pools & Spas** – Monitor TDS levels to prevent maintenance problems.

**HVAC** –

Test condensate water in cooling tower and humidifier reservoirs to prevent bacterial growth and drain line corrosion.

Reduce water and chemical consumption in boilers and cooling towers.

Test TDS levels in make-up water to prevent scale formation, corrosion and embrittlement.

Determine when to perform blowdown and add make-up water.

Prevent contamination and corrosion of control valves, heat exchangers and steam traps.

Verify automated TDS controllers are functioning properly.

Prevent low quality wet steam generation in boilers due to foaming caused by high TDS levels.

### **4. WHAT IS TDS (Total Dissolved Solids) ?**

**: The sum of all inorganic particulate material**

- **Water contains a variety of minerals and salts, such as calcium, magnesium, carbonate, chloride and nitrate etc.**
- **TDS is the parameter used when measuring the total sum of all these compounds in water.**
- **TDS is an indicator used for wastewater analysis and measuring mineral content of water.**

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### 1. Precautions

Before use please read this operation manual and observe the procedures and methods specified to ensure accurate, reliable measurements.



Only the sensor area is waterproof, please be careful to avoid getting water into the body from above the probe.

Be careful not to scratch or damage the gold plated sensor surface.

Use care when cleaning the instrument by using a wet cloth or tissue. Use of chemicals such as acetone or benzene may cause deterioration of the housing material (ABS) or cause the device to not work properly.

Never attempt to disassemble or modify this product.



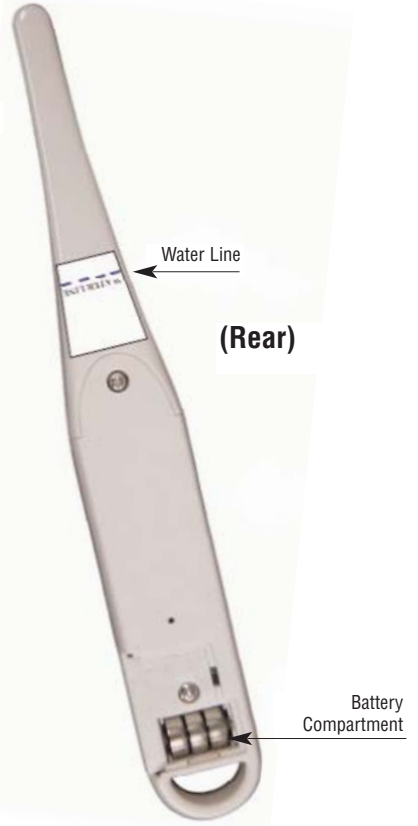
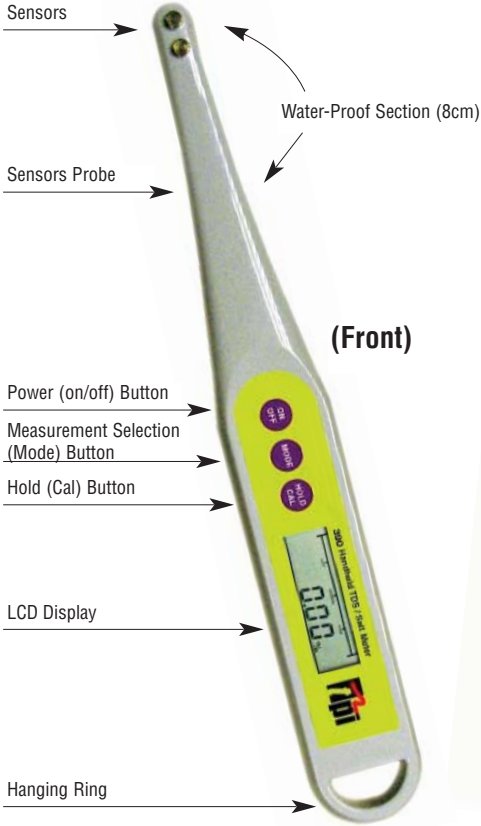
If the sensor is exposed to temperatures below 0°C (32°F) or above 100°C (212°F) for an extended period of time damage may occur.

Please wash the sensor using a neutral detergent and soft cloth or sponge before and after use.

After rinsing fully with water, wipe the sensor softly using dry cloth or tissue and always keep dry while not in use.

While measuring, make sure the sensor does not contact the bottom or sides of the container or any solid material within the measured sample. If contact is made with the container or solid material the displayed reading might be lower than the actual value.

## 2. Product Description



### 3 Functions

#### **Sensors**

Used to measure Salt concentration, TDS and Temperature. The surface is gold plated and the temperature sensor is contained inside.

This area is waterproof.

#### **Power (ON/OFF) button**

Used to turn the power on and off. After use, the power turns off automatically within one minute.

#### **Measurement selection (MODE) button**

Used to select the measurement mode: Salt concentration(%), TDS(ppm, mg/L) or Temp. (°C). When the power is turned on, the default mode is the temperature mode.

#### **Hold / CAL button**

Used to freeze the measured value during a test, perform Auto Calibration or switch between Celsius and Fahrenheit (°C/°F). Please refer to section (5) and (6) for detailed instructions.

After viewing measurement, press again to clear LCD screen and start another test.

#### **Changing Between °C/°F**









1> °C → °F

1. Press the POWER button (ON/OFF)
2. Press down “**HOLD/CAL**” button for 3 Sec. until you hear a beep.
3. Release the “**HOLD/CAL**” button after the beep.
4. “°F” displays on LCD.

2> °F → °C Repeat the steps above.

#### 4. LCD display Symbols

Display	Contents
°C/°F	Indicates the temperature of sample.
%	Indicates the salt concentration contained within the sample.
TDS	It indicates the TDS volume within the sample. It states in 4 figures without any unit
HOLD/CAL	It is lighted when the measured value is held /is used to “ Auto Calibration” or “ Auto Temp Exchange”
ERROR	Appears when measurement range (0.00%~5%) or measurement temperature range (0°C~70°C) is exceeded upon the measurement of salt concentration.
<b>B</b>	When replacement of the battery (button type) is needed.

	LCD Display	Salt concentration
1		Salt concentration under 0.1%
2		Salt concentration above 0.1% but under 0.4%
3		Salt concentration above 0.4% but under 0.7%
4		Salt concentration above 0.7% but under 0.9%
5		Salt concentration above 0.9% but under 1.1%
6		Salt concentration above 1.1% but under 1.3%
7		Salt concentration above 1.3% but under 2.1%
8		Salt concentration 2.1% more

## 5. Specifications

<b>Name</b>	Handheld Digital TDS/Salt-Meter
<b>Model number</b>	390
<b>TDS</b>	Measurement Range: 0 ~ 999ppm (mg/L) Measurement accuracy: +3% Full scale (@20°C) Excellent temperature range: 10°C ~ 30°C (50°F ~ 86°F) Measurement Temperature range: 0°C ~ 40°C (32°F ~ 104°F)
<b>Salt measurement</b>	Measurement method: Electric Conductivity measurement system Measurement range: 0.00% ~ 5.0% Excellent temperature: 10°C ~ 40°C (50°F ~ 104°F) Measurement temperature range : 0°C ~ 70°C (32°F ~ 158°F)
<b>Temperature measurement</b>	Measurement range: 0°C ~ 100°C (32°F ~ 212°F) Measurement accuracy: $\pm 1^{\circ}\text{C}$ (temperature range: 0°C ~ 70°C) of reading
<b>Resolution (@20°C)</b>	Salt measurement: 0.01% ~ 0.1% TDS: 1ppm (mg/L)
<b>Power Supply</b>	LR44 Button Battery x 3 pcs
<b>Battery life</b>	About 1 month based on 10 uses per day
<b>Size</b>	16.4 (D) × 32 (H) × 255 (W) mm (0.7" × 1.3" × 10.0" )
<b>Weight</b>	About 57g (2oz) (including button battery)
<b>Accessories</b>	Button Battery 6Pcs, Sensor protection Cap 1Ea, Operation Manual, Supporting Spoon:1Ea, 2% NaCl Standard Solution:1Btl

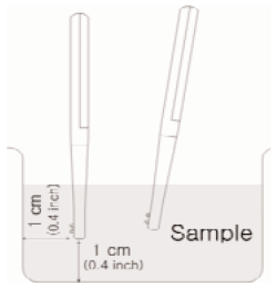
## 6. Measuring Concentrations and Temperature

(1) Turn the 390 on and the temperature is displayed. Fully immerse the sensor into the liquid to be measured. If a solid food is being measured, break it into pieces and dilute it with water. Allow approximately 10 seconds for the temperature to stabilize. After confirming the temperature, push the measurement selection (mode) button to select the salt concentration measurement mode.

(2) Allow the reading to stabilize and confirm the measured salt concentration (%). Push the mode switch again to display the TDS (ppm, mg/L). Pushing the 'HOLD /CAL' switch will freeze the display and 'HOLD' appears on the display. Remove the salt meter from the sample and after confirming the measured value, press the 'HOLD/CAL' switch to deactivate display hold.

(3) Wash the sensor with a neutral detergent using a soft cloth or sponge each after use and rinse with water. Dry the sensor and store with the sensor cover installed

### Sample Location for Accurate Measurement





## 7. Battery Replacement & Troubleshooting

Replace the battery when the **B** symbol appears on the display.

- (1) Open the cover in the back of the main body and pull out the used battery. Insert a new battery (LR44) paying attention to the polarity (positive(+), negative(-)). Always replace each of the 3 cells with new ones at the same time.
- (2) Close the cover and turn on power to confirm whether the batteries were replaced correctly.

Status	Cause	Corrective Action
LCD display dim or not working.	Exceeded service life of batteries	Replace batteries.
Unstable readings	Contamination of sensor part	Wash the sensor part with neutral detergent and rinse fully with water. Wipe it softly with a dry cloth and tissue.

## 8. Calibration (Salt Concentration) Calibration is only needed when measurements become abnormal.

- 1> Press the Power button (ON/OFF)
- 2> Press the "MODE" button. Put the sensor into 2% NaCl calibration solution (Make sure the sensor does not contact bottom or sides of the calibration sample)
- 3> While the sensor is in the solution, press down "HOLD/CAL" button for 3 Sec., then 'CAL' will be displayed on LCD with the beep. Wait for 5-10 Sec. without pressing any keys
- 4> After 5-10 Sec. 30ppt will be displayed.
- 5> Calibration is complete.