JENCO®

VisionPlus

Operation Manual

Hand-held Conductivity/Salinity/TDS/ Temperature Meter

EC3840

CONTENTS

GENERAL INTRODUCTION

Thank you for selecting the EC3840 meter. The EC3840 is a precision tool that measure conductivity, salinity, TDS and temperature. A built-in microprocessor stores, calculates and compensates for all parameters related to conductivity and temperature determinations.

This unit has a waterproof IP67 case. The touch mode keys are highly reliable with tactile and audio feedback. This meter uses four "AAA" batteries. Re-calibration is not required when power is restored.

The front of the meter has a large LCD that displays temperature and either temperature compensated or non-temperature compensated conductivity, salinity or TDS simultaneously along with user prompts and mode indicators. The unit prompts the user through calibration and measurement procedures.

The model EC3840 is available with a single four-wire conductivity cell. Other features include automatic conductivity ranging, automatic temperature compensation, long battery life, and 50/60 Hz AC noise rejection. This unit is universal and user-friendly, for field, industrial and laboratory applications.

INITIAL INSPECTION

Carefully unpack the unit and accessories. Inspect for damages made in shipment. If any damage is found, notify your **Jenco** representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

WATER PROOF

Though the EC3840 meter is housed in a watertight case, **DO NOT** use it underwater. The watertight case prevents permanent damage to the unit if accidentally dropped into non-corrosive solutions. Follow these steps immediately if the unit is immersed in any solution:

1. Rinse unit carefully with distilled water. After rinsing and drying, inspect and clean connectors to remove all contaminants that may affect probe connections.

2. Wait for the unit and probe to dry completely before resuming operation.

3. If the unit does not function correctly after steps1 and 2, call JENCO for possible repair or replacement (see Warranty).

INSTALLING THE BATTERIES

The EC3840 meter is packaged with 4 “AAA” alkaline batteries required for operation. To insert the batteries into the meter, follow the procedure outlined below.

1. Use a screw driver to remove the two screws and battery cover to expose the battery compartment. (Figure 1.)

2. Note the polarity and insert the batteries into the battery compartment correctly.

3. Replace the battery cover and make sure to secure the two screws for the water-tight feature.

   [**Note:** Press the “On/Off” key to turn the unit on. If the unit is running then you can press the “On/Off ” key to turn the unit off. The unit will automatically turn off after 10 minutes of no key activity.]

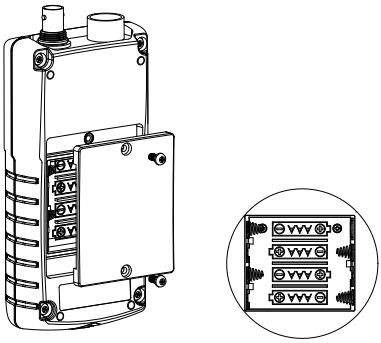


Figure 1: Battery compartment

DISPLAY & KEYS FUNCTIONS

A. Display

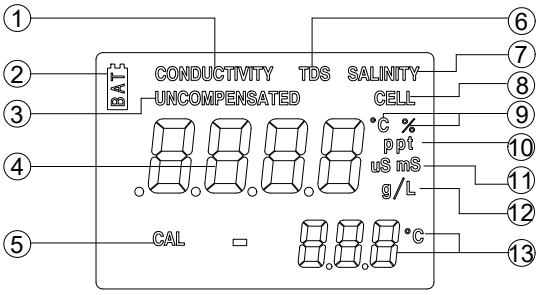
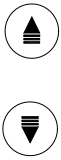


Figure 2: Active LCD screen

1. **CONDUCTIVITY-** Displays when measuring conductivity.	8. **CELL-** Indicates conductivity cell constant value.
2. **BAT-** Low battery indicator.	9. **℃/%-** Displays during calibration: **℃:** Indicates temperature reference unit. **%:** Indicates temperature coefficient unit.
3. **UNCOMPENSATED-** Distinguish between temperature compensated and non-temperature compensated reading.	10. **ppt-** Parts per thousand; indicates salinity measurement.
4. **MAIN DISPLAY-** For compensated and uncompensated conductivity, salinity and TDS values.	11. **uS/mS-** microsiemens or millisiemens, indicates conductivity measurement.
5. **CAL-** Calibration mode indicator	12. **g/L-** Grams/Liter; indicates TDS measurement.
6. **TDS-** Displays when measuring total dissolved solids.	13.Temperature and unit display
7. **SALINITY-** Displays when measuring salinity.	

B. Keys

	**On/Off-** Powers on and shuts off the meter.
	**Mode-** Selects display mode. In normal operation, press Mode to sequentially display compensated conductivity, salinity, total dissolved solids (TDS) and uncompensated conductivity. In calibration mode, this key exits the current calibration and displays the next calibration parameter.
	**Up/Down-** Increases or decreases the display value as desired.
	**Cal-** In normal operation, changes the mode from Normal to Calibration.
	**Enter-** In Calibration Set-up, press this key to save the current parameter to memory.

OPERATIONAL PROCEDURES

A. Preparing Standard Solutions

Suitable conductivity standards are available commercially or the user can prepare them using research grade reagents.

Here are some standard solutions the user can prepare to calibrate the probe of the model EC3840.

1. Standard solution of 1413uS at 25℃: Accurately weight out 0.746 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.

2. Standard solution of 12.90mS at 25℃: Accurately weight out 7.4365 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.

3. Standard solution of 111.9mS at 25℃: Accurately weight out 74.264 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.

   [Note: You can store the remaining solution in a plastic container for one week but the air space between the cap and the solution must be kept to an absolute minimum. Storing the excess solution below 4℃ can increase the storage life. If you have any doubt of the accuracy of the stored solution, a fresh batch should be prepared.**]**

B. Calibration

Calibration setup contains five sections: TDS, Cell, Temperature Coefficient, Temperature reference and Conductivity Calibration. To access these sections:

1. Connect the conductivity probe 3840NP to the unit and turn the unit on. The screen will display **CELL** and the cell constant of the conductivity probe.

2. Allow temperature reading to stabilize, press "**Cal**" key to enter the calibration mode. **CAL** appears on the LCD. Press "**Mode**" key to sequentially display the following sections:

   [Note: Press "**Enter**" key to accept any values changes in each section and automatically advance to the next section. If there are no changes, the unit accepts the current value and proceeds to the next section.**]**

   TDS

   TDS is determined by multiplying conductivity (mS) by a TDS factor. The default factor value is 0.65. To change the TDS factor, use the up and down keys to adjust the value between 0.30 and 1.00. Press "**Enter**" key to save the new value, or press "**Mode**" key to cancel the change and display the **CELL** screen.

   CELL

   The second screen will display **CELL** and the current cell value. The default cell value is 0.50 and is displayed in the lower right of the screen. The unit allows a variance of +/-0.15 before displaying an error message. The cell value can't be adjusted at this screen; calibrating conductivity is the only way to adjust the cell constant. Press "**Enter**" key to reset the cell constant to 0.50 and display the **Temperature Coefficient** screen.

[Note: Be certain to press "**Enter**" key to reset the cell constant to 0.50. If "**Mode**" key is pressed, the unit retains the previous cell constant and calibrates from a value that is already offset.**]**

Temperature Coefficient

The unit uses the temperature coefficient to calculate temperature compensated conductivity. The default value is 1.91%. To change the temperature coefficient, use the up and down keys to adjust the value between 0 and 4.00%. Press "**Enter**" key to save the new value, or press "**Mode**" key to cancel the change and display the **Temperature Reference** screen.

Temperature Reference

The unit uses the temperature reference value to calculate temperature compensated conductivity. The default value is 25℃. To change the temperature coefficient , use the up and down keys to adjust the value between 15 and 25℃. Press "**Enter**" key to save the new value, or press "**Mode**" key to cancel the change and display the **Conductivity Calibration** screen.

Conductivity Calibration

(a) Immerse the probe in a standard of known conductivity, preferably a standard in the middle range of the solutions to be measured. Immerse the probe (at least 2" to 3" or 5~7cm from the tip) without touching the sides of the calibration container. Shake the probe lightly to remove any air bubbles trapped in the conductivity cell.

(b) Allow temperature to stabilize. The message "rAGE" (range) may display briefly to indicate unit auto-ranging; this is normal. After temperature stabilization, use the up and down keys to adjust the conductivity value to that of the conductivity standard at 25℃. Press "**Enter**" key to calibrate. The unit beeps twice to indicate a successful calibration, Then automatically switches to normal operation mode.

C. Conductivity Measurements

1. Turn the unit on. Place the probe in the solution to be measured. Immerse the probe (at least 2" to 3" or 5~7cm from the tip). Shake the probe lightly to remove any trapped air bubbles in the conductivity cell.

2. Press “**Mode**” key to enter the desired measurement mode. The message “rAGE” (range) may appear briefly on the display indicate auto-ranging; this is normal. Allow temperature to stabilize before taking measurements.

ERROR DISPLAYS AND TROUBLESHOOTING

<table>
<tr><th>Main Display</th><th>Secondary Display</th><th>Possible cause(s)</th><th>Corrective Action(s)</th></tr>
<tr><td>"over" during measurements</td><td>/</td><td>● Conductivity is > 200.0mS.
● Salinity is > 70.0ppt.</td><td rowspan="2">●Ensure the probe is immersed at least 2”~3” or 5~7cm from the tip, below the surface of the sample/standard solution.
●Allow sufficient time for the electrode and Temp probe to stabilize.
●Recalibrate with correct value for the conductivity standard.
●Replace conductivity standard.
●Clean cell.</td></tr>
<tr><td>"over " during calibration</td><td>/</td><td>Cell Constant Calibration is out of range.</td></tr>
<tr><td rowspan="2">"over " during measurements</td><td>over</td><td>Temperature > 90.0℃</td><td rowspan="2">Decrease/Increase the sample temperature.</td></tr>
<tr><td>undr</td><td>Temperature < -10.0℃</td></tr>
</table>

[Note: If the unit still does not perform normally after the above measures are taken, call **Jenco** Service Department.**]**

SPECIFICATIONS

Display	Range	Resolution	Accuracy
Conductivity	0.0 to 499.9uS/cm	0.01uS/cm	±1% of reading + 2uS/cm
	500 to 4999uS/cm	1uS/cm	±1% of reading + 5uS/cm
	5.00 to 49.99mS/cm	0.01mS/cm	±1% of reading +0.05mS/cm
	50.0 to 200.0mS/cm	0.1mS/cm	±2.5% of reading + 0.5mS/cm
TDS	0.0mg/L to 200.0g/L	0.1mg/L (minimum)	±1% of reading
Salinity	0.0 to 70.0ppt	0.1ppt	±0.2% Full Scale
Temperature	-10.0 to 90.0 °C	0.1 °C	±0.2°C or ±0.4% Full Scale, whichever is greater.

Reference Temperature	15.0 to 25.0 °C
Temperature Coefficient	0.0% to 4.0%
Cell Constant	0.5 ± 0.15
TDS Constant Range	0.30 to 1.00
Power	Four “AAA” Batteries
Calibration Back-up	EEPROM
Audio Feedback	All Touch Keys
Display (pH /mV : Temp)	11mm : 7mm high LCD
Ambient Temperature Range	0 to 50 °C
Relative Humidity	up to 90%
Case	IP67 water-tight case
Dimensions (W x D x H)	75mm x 157mm x 35mm
Weight	230 grams (Batteries included)

WARRANTY

Jenco warrants this product to be free from significant deviations in material and workmanship for a period of 1 year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the year period, please return-freight-prepaid and the correction of the defect will be made free of charge. If you purchased the item from our **Jenco** distributors and it is under warranty, please contact them to notify us of the situation. **Jenco** Service Department alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.
RETURN OF ITEMS
Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. **Jenco** will not be responsible for damage resulting from careless or insufficient packing. A fee will be charged on all authorized returns.

NOTE: Jenco reserves the right to make improvements in design, construction and appearance of our products without notice.

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