Operation Manual

Hand-held DO/Temperature Meter

9010M

CONTENTS

GENERAL INTRODUCTION……..2

INITIAL INSPECTION……..2

WATER PROOF……..2

INSTALLING THE BATTERIES……..3

DISPLAY & KEYS FUNCTIONS…..……..……4

- **A. Display 4**
- **B. Keys.....5**

MODES OF THE METER……..6

OPERATIONAL PROCEDURES……..7

- **A. Probe Preparation.....7**
- **B. Dissolved Oxygen Calibration.....8**
- **C. Dissolved Oxygen Measurements.....9**
- **D. Save, Recall and Delete Data.....9**

ERROR DISPLAYS AND TROUBLESHOOTING.....10

SPECIFICATIONS……..10

WARRANTY……..11

GENERAL INTRODUCTION

Thank you for selecting the 9010M meter. The 9010M is a precision tool that measure dissolved oxygen in % and ppm (mg/L) and temperature. A built-in microprocessor stores, calculates and compensates for all parameters related to DO determinations including DO electrode temperature characteristics.

This unit has a waterproof IP65 case. The touch mode keys are highly reliable with tactile and audio feedback. This meter can operate with one 9V battery. Re-calibration is not required when power is turned on again.

The front of the meter has a large LCD that displays DO % or ppm, and temperature simultaneously along with user prompts and mode indicators. The unit prompts the user through calibration and measurement procedures.

The 9010M uses a galvanic electrode with convenient screw-on cap membranes. The LD-900-11 field probe comes with a built-in temperature sensor for automatic temperature compensation.

The unit is also equipped with a non-volatile memory allowing the user to store 50 different sets of readings. This unit will assign a site number for each set of reading, so the user can review the data easily.

Other features include long battery life and 50/60Hz AC noise rejection. This meter is 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 9010M 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 9010M meter is packaged with one 9V battery required for operation. To insert the batteries into the meter, follow the procedure outlined below.

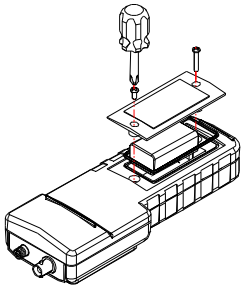


Figure 1: Battery compartment

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

2. Replace the 9V battery.

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 45 minutes of no key activity.]

DISPLAY & KEYS FUNCTIONS

A. Display

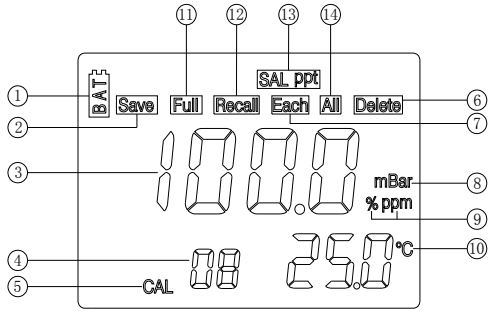


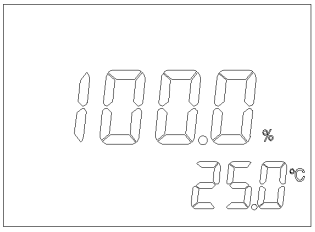
Figure 2: Active LCD screen

1. **BAT-** Low battery indicator.	8. **mBar-** Display during calibration to prompt user for barometric pressure.
2. **Save-** To save a reading into the data storage.	9. **%/ppm-** Unit indicators.
3. **MAIN DISPLAY-** Main display for DO dissolved oxygen values.	10. Temperature and unit display
4. Data storage site number.	11. **Full-** This will indicate that all 50 data storage sites are used up.
5. **CAL-** Calibration mode indicator	12. **Recall-** To recall data from the data storage.
6. **Delete-** To delete stored data.	13. **SAL ppt-** Displays during calibration when user is prompted for the approximate salinity of the sample in parts per thousand (ppt).
7. **Each-** To delete a single set of data from the data storage.	14. **All-** To delete all the data in the data storage.

B. Keys

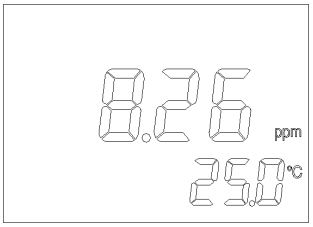
ON/OFF	**ON/OFF-** Powers on and shuts off the meter.
MODE	**MODE-** Selects display mode. In normal operation, press this key to sequentially display Dissolved Oxygen in % air saturation, Dissolved Oxygen in ppm (mg/L), Recall and Delete interface. In calibration mode, press this key to exit the current calibration parameter and enter into the next one. In “Recall” and “Delete” modes, press this key to exit “Recall” and “Delete” modes respectively.
^ v	**UP/DOWN-** Increases or decreases the display value as desired. In “Recall” mode, view saved data and data storage site number by pressing these keys. In “Delete” mode, press these keys to select between the “Delete Each” and “Delete All” mode. In “Delete Each” mode, view to be deleted data and data site numbers by pressing these keys.
CAL	**CAL-** In “Measurement” mode, press this key to enter into “Calibration” mode.
ENTER	**ENTER-** In “Calibration” mode, press this key to save the current parameter to memory. In “Measurement” mode, press this key to save reading into the next available data storage site. At the Recall interface, press this key to display the last set of saved data. At the Delete interface, press this key to go into “Delete” mode. In the “Delete All” mode, press this key to delete all saved data. In the “Delete Each” mode, press this key to delete a single set of data.

MODES OF THE METER



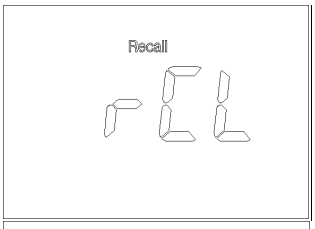
1. **Dissolved Oxygen in % mode:**

The unit will display **dissolved oxygen** reading (%).



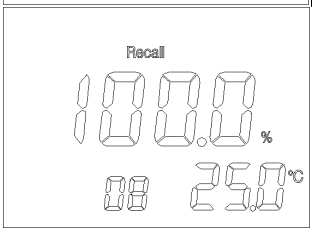
2. **Dissolved Oxygen in ppm mode:**

The unit will display **dissolved oxygen** reading (ppm).



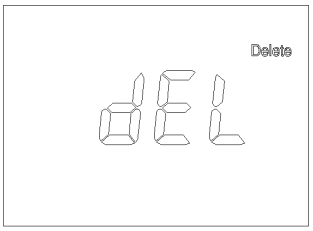
3. **Recall interface:**

Press “ENTER” key to go into recall mode.



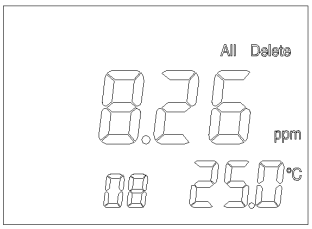
4. **Recall mode:**

In this mode, user can recall data saved in memory.



5. **Delete interface:**

Press “ENTER” key to go into delete mode.

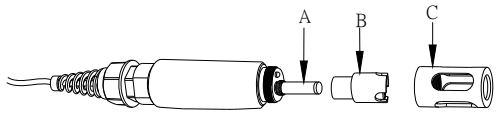


6. **Delete mode:**

In this mode, user can erase each data or all data saved in memory.

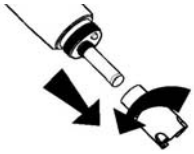
OPERATIONAL PROCEDURES

A. Probe Preparation

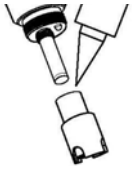


(A) Lead (B) Membrane Cap (C) Guard Cap

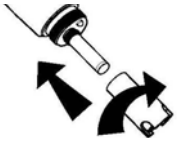
1. Remove the guard cap.



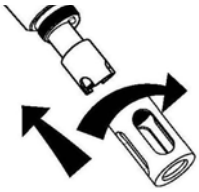
2. Remove the membrane cap.



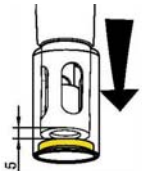
3. Fill solution into cover cap.



4. Twist the membrane cap back on to the probe. Rinse the probe well with distilled water, wipe the end of the probe dry.



5. Twist the guard cap back on to the probe.



6. Place 5~6 drops of clean water into the sponge inside the calibration bottle. Slide the probe into the calibration bottle. Be sure the membrane does not touch the sponge, at least 5mm space between the probe and the sponge.

B. Dissolved Oxygen Calibration

The 9010M can be calibrated quickly and easily in air.

1. Connect the DO probe LD-900G-1 to the unit and turn the unit on.

2. Hold the probe in the air gently with the sensor facing down and press “MODE” key to select “Dissolved Oxygen in %” mode.

3. Wait 10 to 15 minutes for the dissolved oxygen and temperature reading to stabilize, press the “CAL” key to enter the “Calibration” mode. The “CAL” icon appears on the LCD. The main screen will display “1013mBar” (factory default value). The meter is now ready for atmospheric pressure calibration.

4. To change the pressure factor, use the “UP” and “DOWN” keys to adjust the value between 600 and 1100mBar. Press “ENTER” key to save the new value and the unit will automatically go into the next calibration parameter which is the value of 100% saturation in air. If “MODE” key is pressed

instead of the “ENTER” key, any changes made will be cancelled and the previous calibration settings will be retained.

5. In this interface, the user can views the calibration value in the secondary display. Once the value in the main display stabilizes, press “ENTER” key to save the new value and the unit will automatically go into the salinity compensation parameter. If “MODE” key is pressed instead of the “ENTER” key, any changes made will be cancelled and the previous calibration settings will be retained.

6. The salinity default factor value is 0.0 ppt. To change the salinity compensation factor, use the “UP” and “DOWN” keys to adjust the value between 0 and 40 ppt. Press “ENTER” key to save the new value and the unit will automatically switch to “Measurement” mode. Calibration is now complete. If “MODE” key is pressed instead of the “ENTER” key, any changes made will be cancelled and the previous calibration settings will be retained and will automatically switch to “Measurement” mode.

C. Dissolved Oxygen Measurements

Press “MODE” key to choose the dissolved oxygen in % mode or dissolved oxygen in ppm mode. Rinse the DO probe with distilled water and immerse it in the sample to be measured.

D. Save, Recall and Delete Data

a. Saving readings to memory.

1. In “Measurement” mode, press the “ENTER” key to save data. The “Save” icon with the corresponding site number will lit up for a brief moment to indicate a successful data save.

2. If the “Full” icon is displayed, this means that all 50 data saving sites are used up. No new data can be saved until existing saved data are deleted.

b. Recalling readings from memory.

1. To recall saved data, press “ENTER” key at the Recall interface to go into “Recall” mode.

2. Press the “UP” or “DOWN” keys to select the storage site number.

3. Press “MODE” key to exit “Recall” mode.

c. Deleting data.

1. Press the “ENTER” key at the Delete interface to go into “Delete” mode.

2. Select “Delete All” or “Delete Each” mode by pressing the “UP” or “DOWN” key.

3. In the “Delete all” mode, press “ENTER” key to clear all stored data. Deletion is now complete.

4. In the “Delete Each” mode, use “UP” and “DOWN” key to select data to be deleted. Then press “ENTER” key to delete. Deletion is now complete. The next set of saved data will automatically move up a slot in the storage site.

5. Press “MODE” key to exit “Delete” mode.

ERROR DISPLAYS AND TROUBLESHOOTING

Main Display	**Possible Cause(s)**
“OvEr” or Undr	1. Check membrane and electrolyte solution. 2. Clean anode and cathode.
Secondary Display	**Possible Cause(s)**
"Udr"	1. Heat the sample to above -6.0℃.
“Ovr”	1. Cool the sample to below 46.0℃.

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

SPECIFICATIONS

Display	Range	Resolution	Accuracy
Dissolved Oxygen ppm (mg/L)	0 to 20.00 ppm (mg/L)	0.01 ppm (mg/L)	±0.5FS
Dissolved Oxygen %	0 to 200.0 %	0.1%	±0.5FS
Temperature	-6.0 to 46.0 °C	0.1 °C	±0.3°C±1 digit

Pressure compensation	600 to 1100 mBar (450 to 825 mmHg)
Salinity compensation	0.0 to 40.0 ppt
Temperature sensor	Thermistor, 10 kΩ at 25°C

Power	9Volt battery
Calibration Back-up	EEPROM
Datalogging capabilities	50 data sets
Automatic shut off function	45 minutes of non-use
Audio Feedback	All Touch Keys
Display (pH / mV : Temp)	12mm : 8mm high LCD
Ambient Temperature Range	0 to 50 °C
Relative Humidity	At 90% RH
Case	IP65 waterproof
Dimensions (W x D x H)	70mm x 198mm x 37mm
Weight	260 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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