Gain Express 8403_FBACO

Gain Express Dissolved Oxygen Meter

Model: 8403_FBACO

1. Introduction

1.1 Product Overview

The Gain Express Dissolved Oxygen Meter is a high-precision instrument designed for measuring dissolved oxygen (DO) levels, temperature, and barometric pressure. It is equipped with advanced features for accurate and reliable readings in various environments.

1.2 Key Features

- High-precision DO measurement (%, ppm/mg/L)
- Large LCD display for simultaneous readings of DO, temperature, and barometric pressure
- Automatic Temperature Compensation (ATC)
- Manual salinity adjustment
- 99-data memory with real-time clock
- Data hold function
- Low battery indicator
- Selectable auto power-off (20-120 minutes)
- Durable Clark-type electrode with 11.48 ft cable and extended lifespan with proper maintenance

1.3 Applications

This dissolved oxygen meter is suitable for a wide range of applications, including:

- Aquaculture (fish farming, aquariums)
- Industrial water quality monitoring
- Environmental research and monitoring
- Educational purposes

Image 1.1: The Dissolved Oxygen Meter is used in diverse settings such as aquaculture, hydroponics, and scientific laboratories.

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Video 1.1: An overview of the Dissolved Oxygen Meter, its features, and various applications in water quality monitoring.

2. Package Contents

Upon opening the package, verify that all items listed below are present and in good condition:

- Dissolved Oxygen Meter Unit
- DO Probe with 11.48 ft (3.5m) Cable
- 4 x AAA Batteries
- 5 x Teflon Membranes
- 5 x O-rings
- 2 x Electrolyte Bottles
- English Instruction Manual
- Sturdy Carrying Case

Image 2.1: All components included in the Dissolved Oxygen Meter kit.

3. Components Overview

3.1 Meter Unit

The main meter unit features a large LCD display and several function keys for operation.

- **LCD Display:** Shows dissolved oxygen readings, temperature, barometric pressure, time, and various indicators.
- **Function Keys:**
  - **SET:** Enters setup mode or confirms settings.
  - **MODE:** Switches between measurement modes or menu options.
  - **CAL/Esc:** Initiates calibration or exits current menu/setting.
  - **MEM:** Accesses memory records.
  - **HLD/Rec:** Activates data hold or recording function.
  - **MR/AV:** Recalls memory data or calculates average.

- **Probe Port:** Connector for the DO probe.

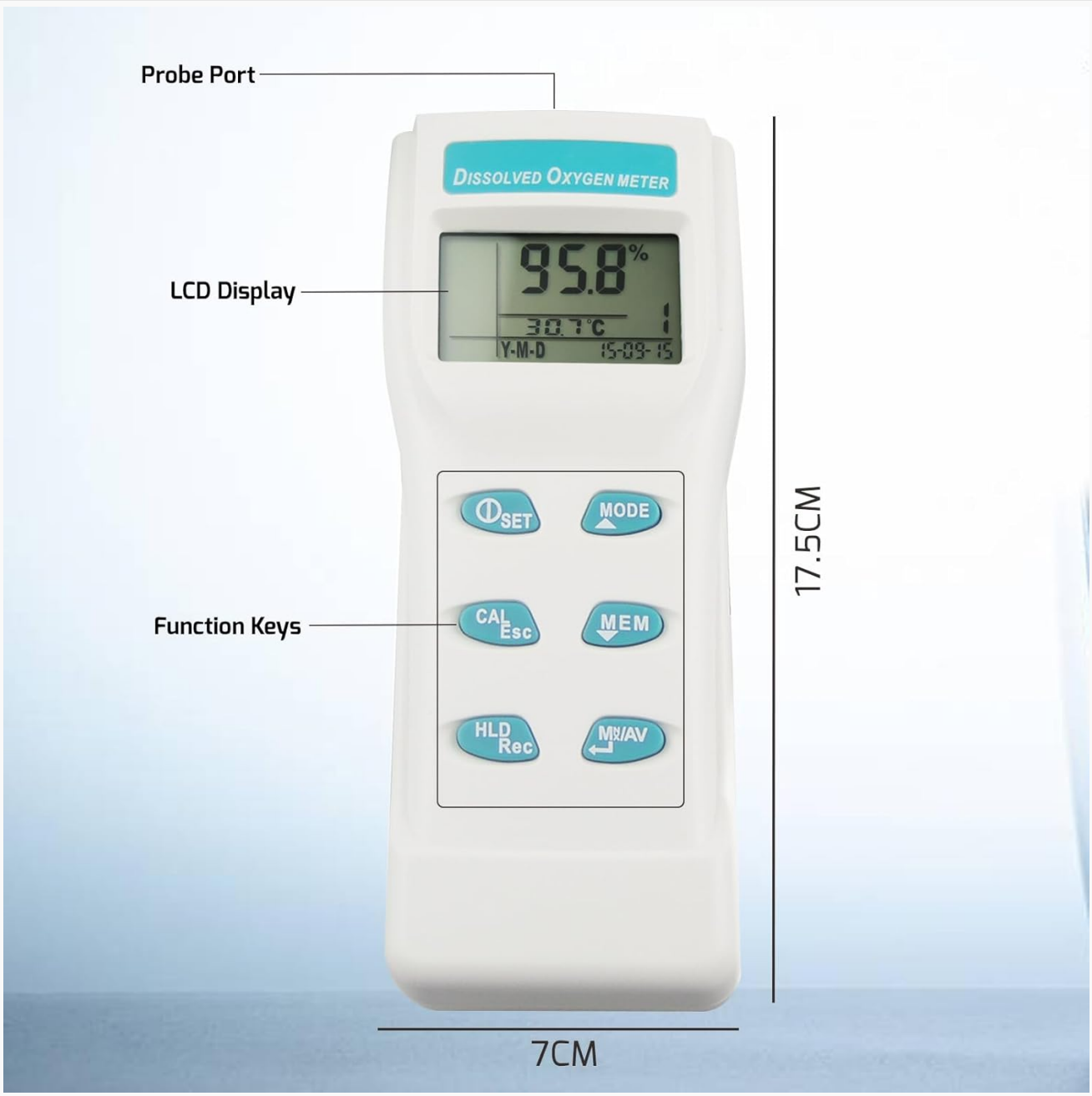

Image 3.1: Labeled diagram of the Dissolved Oxygen Meter unit.

3.2 DO Probe

The Clark-type DO probe is responsible for sensing dissolved oxygen levels. It connects to the main unit via a cable.

- **Sensor Tip:** Contains the sensitive membrane and electrodes for DO measurement.
- **Cable:** Connects the probe to the meter unit.

Image 3.2: The Dissolved Oxygen probe.

4. Setup

4.1 Battery Installation

1. Locate the battery compartment on the back of the meter unit.
2. Open the compartment cover.
3. Insert 4 AAA batteries, ensuring correct polarity (+/-).
4. Close the battery compartment cover securely.

4.2 Probe Connection

1. Align the connector of the DO probe cable with the probe port on the top of the meter unit.
2. Gently push and twist the connector clockwise until it is securely fastened.

4.3 Electrolyte Preparation and Membrane Installation

The DO probe requires an electrolyte solution and a membrane cap for proper function. Refer to the detailed instructions in the included manual for precise steps on preparing the electrolyte solution and installing the Teflon membrane and O-rings onto the probe cap.

5. Operating Instructions

5.1 Power On/Off

- Press the **SET** button to power on the meter.
- To power off, press and hold the **SET** button until the display turns off, or allow the auto power-off function to activate.

5.2 Measurement Modes

The meter can display dissolved oxygen in percentage (%), parts per million (PPM), or milligrams per liter (mg/L).

- Press the **MODE** button to cycle through the available DO measurement units.

5.3 Temperature Measurement

The meter automatically measures and displays temperature alongside DO readings. The temperature unit can be switched between Celsius and Fahrenheit.

- Refer to the full manual for instructions on changing the temperature unit.

5.4 Salinity Adjustment

For accurate DO readings in saline water, manual salinity compensation is required.

- Enter the setup menu using the **SET** button and navigate to the salinity setting.
- Adjust the salinity value according to your sample's known salinity.

5.5 Barometric Pressure Input

Barometric pressure affects dissolved oxygen solubility. The meter allows for manual input of barometric pressure for compensation.

- Access the barometric pressure setting in the setup menu to input the local barometric pressure.

5.6 Data Hold Function

- Press the **HLD/Rec** button briefly to freeze the current reading on the display.
- Press it again to release the hold.

5.7 Memory Function

The meter can store up to 99 data sets, each with a real-time clock stamp.

- To save a reading, press and hold the **HLD/Rec** button until 'REC' appears.
- To recall saved data, press the **MEM** button. Use the navigation buttons (if available, or refer to manual) to scroll through records.

Image 5.1: Operating features of the Dissolved Oxygen Meter.

Image 5.2: The meter features 99 data memory with real-time clock.

Image 5.3: Low battery indicator on the meter's display.

6. Calibration

Regular calibration is essential for maintaining the accuracy of your Dissolved Oxygen Meter. The meter supports both air saturation and zero oxygen calibration methods.

6.1 Air Saturation Calibration

This method calibrates the probe in air-saturated water or in humid air, representing 100% saturation.

1. Ensure the probe is clean and has a properly installed membrane and fresh electrolyte.
2. Place the probe in a humid air environment (e.g., in a bottle with a small amount of water, ensuring the probe tip is not submerged) or in air-saturated water.
3. Press the **CAL** button to enter calibration mode.
4. Follow the on-screen prompts to confirm the air saturation point.

6.2 Zero Oxygen Calibration

This method calibrates the probe to a zero oxygen level, typically using a zero-oxygen solution.

1. Prepare a zero-oxygen solution (e.g., using sodium sulfite).
2. Immerse the probe into the zero-oxygen solution.
3. Press the **CAL** button and follow the on-screen prompts to confirm the zero oxygen point.

For detailed step-by-step calibration procedures, including specific values and stability requirements, please refer to the comprehensive instruction manual provided with your device.

7. Maintenance

Proper maintenance ensures the longevity and accuracy of your Dissolved Oxygen Meter.

7.1 Probe Care

- Always keep the probe tip moist when not in use. Use the protective cap filled with a small amount of storage solution or clean water.
- Clean the probe regularly with distilled water to remove any residue. Avoid abrasive materials.

7.2 Membrane Replacement

The Teflon membrane is a consumable part and needs periodic replacement, especially if damaged or if readings become unstable.

- Carefully unscrew the membrane cap from the probe.
- Remove the old membrane and O-ring.
- Install a new Teflon membrane and O-ring, ensuring it is smooth and free of wrinkles or air bubbles.
- Refill the cap with fresh electrolyte solution before screwing it back onto the probe.

7.3 Electrolyte Solution Replacement

The electrolyte solution inside the probe cap should be replaced periodically (e.g., every 1-3 months or when readings become sluggish).

- Follow the membrane replacement procedure to access the electrolyte.
- Discard the old solution and refill with fresh electrolyte from the provided bottles.

7.4 Storage

- Store the meter and probe in the provided carrying case when not in use.
- Remove batteries if the meter will not be used for an extended period to prevent leakage.
- Store in a cool, dry place away from direct sunlight and extreme temperatures.

8. Troubleshooting

If you encounter issues with your Dissolved Oxygen Meter, refer to the table below for common problems and solutions.

Problem	Possible Cause	Solution
Meter does not power on	Dead or incorrectly installed batteries	Replace batteries, ensuring correct polarity.

Problem	Possible Cause	Solution
Inaccurate or unstable readings	• Probe not calibrated • Damaged or dirty membrane • Old or contaminated electrolyte • Air bubbles on membrane • Incorrect salinity/pressure compensation	• Perform calibration (air saturation/zero oxygen). • Inspect and clean/replace membrane. • Replace electrolyte solution. • Gently tap probe to dislodge bubbles. • Verify and adjust salinity/pressure settings.
"Low Battery" indicator	Batteries are low	Replace all 4 AAA batteries.
No response from buttons	Meter frozen or malfunction	Remove and reinsert batteries to reset the meter. If problem persists, contact support.

9. Specifications

Parameter	Range	Accuracy	Resolution
Dissolved Oxygen (DO)	0~199.9% / 0~19.99 PPM / 0~19.99 mg/L	±1.5% F.S	0.1% / 0.01 PPM / 0.01 mg/L
Temperature	0~50°C (32~122°F)	±0.3°C	0.1°C
Salinity Compensation	0.0~50.0 ppt	N/A	0.1 ppt
Barometric Pressure	500~1499 mmHg / 66.6~199.9 KPa	N/A	1 mmHg / 0.1 KPa

General Specifications

- **Model Number:** 8403_FBACO
- **Power Source:** 4 x AAA batteries (included)
- **Memory:** 99 data sets
- **Operating Environment:** 0-50°C (32-122°F)
- **Probe Cable Length:** 11.48 ft (3.5m)
- **Item Weight:** 1 pound
- **Package Dimensions:** 6.97 x 5.75 x 2.72 inches

10. Warranty and Support

10.1 Warranty Information

This product is covered by a standard manufacturer's warranty against defects in materials and workmanship. Please retain your proof of purchase for warranty claims. Specific warranty duration and terms may vary; refer to the warranty card included in your package or contact customer support for details.

10.2 Customer Support

For technical assistance, troubleshooting beyond this manual, or warranty inquiries, please contact Gain Express customer support. Contact information can typically be found on the product packaging, the official Gain Express website, or through your retailer.