Dissolved Oxygen Pen

860055

Instruction Manual

SPER SCIENTIFIC

Environmental Measurement Instruments

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1. Introduction

Thank you for purchasing this long cable dissolved oxygen pen. Please read the manual in its entirety and retain for future use. Proper use and maintenance of this product can result in accurate measurements and extended service life.

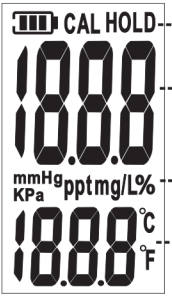
Features:

- Large screen with adjustable brightness
- Small and easy to carry
- Accurate DO and temperature readings
- Low battery indicator
- Rechargeable via a USB Type-C cable
- Simple calibration in air, no chemicals needed
- Easy to maintain
- Built-in automatic temperature compensation

2. Accessories Included

- Dissolved Oxygen Meter
- Dissolved Oxygen Probe w/ 16ft (5m) cable
- 2 Replacement Membranes (PN: 850048H)
- Replacement Electrolyte (PN: 850048E)
- USB Type-C Charging Cable
- User Manual
- Carrying Case

3. LCD Display



4. Keypad Operation

HOLD

- Short press to turn on. When no key is operated for 20 minutes, unit will auto power off. Press and hold when turning on until the word "n" appears to disable the auto off feature.
- In power-on state, short press to HOLD reading.
- In power-on state, long press to power off.
- In settings, short press to confirm setting.

CAL
mg/L↔%

- Short press to switch the units of measure. (mg/L or %)
- Long press to enter the calibration.
- In settings, short press to adjust up.

SET

- Short press to turn on the LCD back light, short press again to turn off back light.
- Long press to enter the settings menu.
- In settings, short press to adjust down.

5. Quick Start

1. No need to remove the anti-collision cover before use.

2. This meter is ready to use and has been pre-filled with electrolyte.

3. Short press the “POWER” button to turn on.

4. Please allow the unit to stabilize for 5 minutes when first powered on.

5. Before each measurement, place the probe in the air for 100% saturated oxygen calibration.

6. If performing daily comparison testing, check the reading at the regular time and regular spot.

7. Maintenance after a period of use is simple. Shake the probe slightly then visibly check the amount of electrolyte. If less than half full, unscrew the membrane head and refill about 3/4 of the way full. If spillage occurs, simply wipe dry. The membrane head should be replaced after approximately six months.

8. If usage is frequent and/or there is a large difference in comparison measurements, it is recommended to replace the membrane head and electrolyte.

9. When replacing the membrane head, make sure to screw it on tightly. The membrane and the metal electrode should be in close contact. Be sure to remove any air bubbles in the electrolyte. A small amount of air bubbles present is acceptable, but the center of the membrane should be free of bubbles.

6. Calibration

In order to obtain accurate readings, we recommend performing calibration before each operation, after membrane and/or electrolyte replacement. There is no need to remove the anti-collision cover to perform calibration.

1. In normal mode, change measurement units to % and place the probe in fresh air. Allow a few minutes for readings to stabilize.

2. Long press “CAL” button to perform the 100% saturation calibration. CAL will flash on the screen.

3. Wait for a few seconds to 1 minute while the reading stabilizes. Once CAL stops flashing, short press the “POWER” button to complete the calibration.

4. After calibration, the display value should read between 99.0% to 101.0%. If an error occurs during calibration, check the electrolyte level and make sure the probe connection is secure.

7. Operation

Charge & checking probe
This product has a built-in rechargeable battery. Unscrew the top cover and use the included USB charging cable to charge. Battery will be charged in 1.5 hours and provide 60 hours of use.

The anti-collision cover on the D.O. probe provides protection and does not need to be removed during use.

Before each regular use, shake the probe gently and visually inspect the electrolyte. Refill the probe with electrolyte if the fluid is less than half full.

Power on & off the Meter
Short press the “POWER” button to turn on the LCD. Long press the “POWER” button to turn off the meter.

Calibration
This meter has been calibrated at the factory, but calibration is still necessary before each use to obtain the best results.

Please refer to the calibration section for calibration procedures.

Obtain Measurements
Immerse the electrode in to the test solution and gently shake. The dissolved oxygen level and temperature will appear on the LCD.

Switching D.O. Units
Short pressing the “CAL” button with switch between % and mg/L units.

LCD Back light
To make it easier to see in dark places, short press the “SET” button to turn on or off the LCD back light.

Holding a Reading
Short pressing the “POWER” button will temporarily lock the current LCD reading. To release the held reading, short press the “POWER” button.

6. Maintenance

Visual Checks
Check the probe every six months or when you observe strange readings.

1. The probe does not need to be filled entirely with electrolyte but once the probe is less than half full, it will need to be refilled.

2. Be sure the probe surface is kept clean and no air bubbles are trapped in the middle of the membrane.

Replacing the Membrane
The probe membrane should be replaced if any of the following occurs:

-The probe has been used for six months or more.
-There is an error code E1 or E3.
-The membrane is damaged or wrinkled.
-The measurement speed is noticeably slower.

Steps:
1. Inspect the new membrane for any damage.

2. Slowly fill the new membrane until the membrane cap is 3/4 full.

3. Unscrew the old membrane off the probe. Inspect the metal sensor on the probe for any debris and wipe clean with a soft cloth.

4. Tightly screw on the new membrane on to the probe. A small amount of air bubbles present is acceptable, but the center of the membrane should be free of bubbles.

5. Perform calibration once membrane replacement is complete.

7. Setup

This meter has an advanced setting mode that allows you to customize parameters. To enter the settings mode, long press the “SET” button.

The first setting you will see is the salinity value. If you want to select other parameters, short press the “POWER” button to cycle through the menu.

When you see the parameter you want to set, short press the “CAL” button and use the “CAL” button to raise the value and use the “SET” button to decrease the value. After adjustment short press the “POWER” button to confirm.

Setting	Icon	Default	Range
Salinity	SAL	0.0 ppt	0.0 ~ 45.0 ppt
Pressure Unit	AP	mmHg	mmHg or Kpa
Pressure	AP	760mmHg 101.3Kpa	500~760mmHg 101.3~66.7Kpa
Temperature Unit	Unt	°C	°C or °F
Back Light Level	bL	2	1, 2, 3 Level

8. Troubleshooting

Error Code List
D.O. Value

E01: Indicates that the sensing element is damaged. Repairs to the sensing element are not possible and the probe will need to be replaced.

E03: The signal strength is to high, it is normal to appear for a few seconds when powering on the unit. If the E03 error continues, perform an air calibration. If no improvement, replace the membrane and electrolyte. If no improvement, the probe will need to be replaced.

E21: The measured temperature is lower than 10°C or above 40°C. This is outside of the automatic temperature compensation range. The D.O. pen will still operate but the accuracy will be affected.

Temperature Value

E01: Indicates that the sensing element is damaged. Repairs to the sensing element are not possible and the probe will need to be replaced.

E02: The temperature is lower than 0°C. Place probe in an environment at or above 25°C for 5 minutes. If no improvement, the probe will need to be replaced.

E03: The temperature is higher than 50°C. Place probe in an environment at or above 25°C for 5 minutes. If no improvement, the probe will need to be replaced.

Specification	
D.O. Range (in mg/L)	0.00~20.00 mg/L
D.O. Accuracy	± 0.4 mg/L
D.O. Resolution	0.01 mg/L
D.O. Range (in %)	0.0~199.9
D.O. Accuracy	± 3% Full Scale
D.O. Resolution	0.1 %
Temp. Range	0~50.0°C / 32~122°F
Temp. Accuracy	0.1°C / 0.2°F
Temp. Resolution	0.1°C
Automatic Temp. Compensation Manual Compensation Salinity Range Salinity Resolution Barometric Pressure Pressure resolution	10~40.0°C / 50~104°F Included 0.0~45.0 ppt 0.1 ppt 500~760mmHg/101.3~66.7Kpa 1mmHg / 0.1KPA
LCD Size	30(H) x 18(W) mm
Operating Temperature	0~40°C / 32~104°F
Operating RH%	<85%
Storage Temperature	0~40°C / 32~104°F
Storage RH%	<80%
Sensor Response Time	30 sec for DO, 90 sec for Temp
Sensor Warm Up Time	60 seconds after power up
Sensor Life Time	>6 months (good maintenance)
Dimensions	176(L) x 39(W) x 39(H) mm
Weight	265g
Battery	3.7V 500mAh Lithium Battery
Power Consumption	60 hours of operation (No back light)
Recharge Time	1.5 hours
Standard Packaging	Meter, D.O. Probe, Electrolyte, 2 Replacement Membranes, USB cable, Manual, Case

WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for a period of **one (1) year** from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover probes, batteries, battery leakage, or damage resulting from accident, tampering, misuse, or abuse of the product. Opening the meter to expose its electronics will void the warranty.

To obtain warranty service, ship the unit postage prepaid to:

SPER SCIENTIFIC
8281 East Evans Road, Suite #103
Scottsdale, AZ 85260

The defective unit must be accompanied by a description of the problem and your return address. Register your product online at www.sperwarranty.com within 10 days of purchase.