

# OPERATION MANUAL

## Long cable Dissolved Oxygen Pen



**Model:** ■ 84131, long cable D.O pen w/ floating probe

**Model:** ■ 8413, long cable D.O pen w/h anti-collision cap



## QUICK GUIDE

1. No need to remove the anti-collision cover of the dissolved oxygen head before use.
2. This product has been pre-installed with electrolyte.
3. Short press the power button to turn on. Setting parameters can be customized to improve accuracy.
4. Please allows 5 minutes polarization time after the first boot, the stability of the product will be better.
5. Before each measurement, place the probe in the air for 100% saturated oxygen calibration. The calibration done at this point allows automatic temperature compensation to work best.
6. Check the reading at regular time and regular spot can provide you the best comparison result.
7. Maintenance after a period of use is simple. Shake the probe slightly and visually check the amount of electrolyte. If there is almost no liquid, unscrew the membrane set and drop sufficient electrolyte. Provided two spare membrane sets are enough for one year.  
Generally speaking, add liquid and replace the membrane set once every six months is fine, frequently unscrewing the membrane set and adding electrolyte will not help the performance. While drop electrolyte, fill about 3/4 full at a time, If having spillage after installation, just wipe it dry.
8. If you are a frequent user, even if it is less than half a year, when the difference between the measured value and the previous time is too large, please replace the membrane set and inject electrolyte.
9. Put on the membrane cover and screw it tightly until the membrane and the metal electrode are in close contact. No air bubbles trapped between the membrane and metal.



## INTRODUCTION

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

Features:

- ◆84131 equipped with floating probe to ensure your measure result is from water not from sand
- ◆Large screen with adjustable backlight brightness.
- ◆The pen type is easy to carry, suitable for all places.
- ◆Accurate dissolved oxygen and temperature readings.
- ◆Low battery indicator, charged through USB typeC cable.
- ◆% and mg/L and °C/°F switchable.
- ◆One key to do 100% D.O. calibration in the air, chemicals is not needed.
- ◆Easy to maintain and high-sensitivity membrane set.
- ◆Built-in automatic temperature compensation
- ◆Manual salinity and barometric pressure compensation
- ◆High accuracy double precious metal D.O. probe

## POWER SUPPLY

This product has a built-in rechargeable battery. Please unscrew the battery cover, use the included charging cable to charge. About 60 hours of continuous use after 1.5 hours of charging.



This enclosed cable is for charging, no data transfer function.

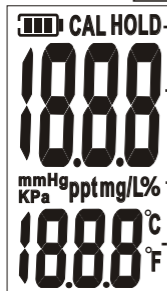
## MATERIAL SUPPLIED

The full package contains:

- ✓ D.O. Meter (built-in battery) x 1
- ✓ D.O. Probe (w/ 3m cable, 84131: floating probe, 8413: anti-collision cap probe)
- ✓ Spare dissolved oxygen membrane set x 2
- ✓ Electrolyte x1
- ✓ Type C charging cable x1
- ✓ Manual x1
- ✓ Storage plastic case x 1



## LCD DISPLAY



----- Battery Level/Calibration/Reading Lock

----- D.O. Value

----- Atmospheric pressure unit/  
salinity unit/  
dissolved oxygen unit

----- Water temperature and units

## KEYPAD OPERATION

**Note: Green text keypad means press longer time**



- ◆ Short press to turn on, when no key operation for 20 minutes, it will automatically turn off
- ◆ In the power-on state, short press to lock the reading
- ◆ In power-on state, **long press** to power off
- ◆ If you don't want to have the function of automatic shutdown function, press and hold the power button when turning it on until the word "n" appears on LCD
- ◆ In the setting state, press this key to confirm setting



- ◆ In the power-on state, short press to switch the display unit of dissolved oxygen. It can be mg/L or %
- ◆ In the power-on state, **long press** to enter calibration
- ◆ In the setting state, press to adjust value upward



- ◆ In the power-on state, short press to turn on the backlight of LCD, and short press to turn backlight off
- ◆ In the power-on state, **long press** to enter the setting mode for customized settings
- ◆ In the setting state, press to adjust value downward

## OPERATION

### Step 1: Charge and check probe status

This product has a built-in rechargeable battery. Unscrew the battery cover on the head, and use the included charging cable to charge. About 60 hours of continuous use after 1.5 hours charging time.

On 8413, the anti-collision cover of the D.O. probe head has protective function and no need to remove before use.

This product is pre-filled with electrolyte.

After the product is charged, it is ready to use. Before each regular use, shake the probe gently and visually inspect the electrolyte inside of the probe is enough.

### Step 2: Power on the meter

Short press the "Power" button to turn on the LCD; if you need to turn it off, **long press** the "Power" button.

### Step 3: Calibration

The instrument has been well calibrated at the factory, but calibration is still necessary before each use to get best result. Simply do calibration in air, chemical powder is not required.

See the Calibration section for calibration details.


### Step 4: Get D.O. Value

Immerse the electrode in the test solution and shake gently. You will see the dissolved oxygen and temperature from the LCD.


For 84131, the patented design floating probe can ensure you get measurement from water, probe won't sink into sand.

When there is no key operation for 20 minutes, it will automatically shut down. The probe cable is 3 meters long, so it can be used even in deep pools.


### Step 5: switch D.O. Unit

The display is preset to %, you can short press the  key to switch to mg/L.

### Step 6: Backlight for dark places

To make it easier to see readings in dim areas, press  key. When the backlight is not needed, press again to turn it off.


### Step 7: Freeze the reading (Hold)


In order to make the hand recording work is easier, press the  key to temporarily lock the reading value. Once the handwriting job is done, press again to dismiss.

## D.O 100% SATURATION CALIBRATION IN AIR

In order to get accurate readings, we recommend that before each operation and after replacing the membrane module, saturated dissolved oxygen calibration is required. No need to remove the anti-collision cover.

**Step 1:** In normal mode, convert dissolved oxygen units to % and place the probe in the air, wait a few minutes till the reading value is stable.

**Step 2:** Long press  key to do 100% saturation calibration. "CAL" will flash on the screen

**Step 3:** Wait for a few seconds to 1 minute, see that the reading is stable and CAL no longer flashes, short press  to complete the calibration.

**Step 4:** After calibration, the displayed value should be 99.0%~101.0%. If an error occurs during calibration, this may cause by low electrolyte or a bad probe condition; see next section to learn how to maintain a dissolved oxygen probe.

# PROBE MAINTENANCE

## Visual Check

Check the probe when you receive a new probe or see strange readings or if the probe has been in use for six months.

1. There is no problem if the electrolyte is not full. While it is less than 1/2 full, fill up the electrolyte.

2. Be sure to check the middle part of the probe surface, The work area should be kept clean as shown on the right photo

*The best condition of the probe is the electrode reaction surface is clean and there is no air bubbles attached.*



## How to replace membrane set

Replace the membrane pack when any of the following occurs:

- The probe has been used for more than half a year.
- There is an error code E1/E3, but the central working area of the probe is still clean.
- The membrane is damaged or wrinkled.
- The measurement speed is much slower than before.

Steps:

(1)

Prepare a new membrane set. The structure of this membrane set is sensitive, not recommended to reuse the membrane set.

(2)

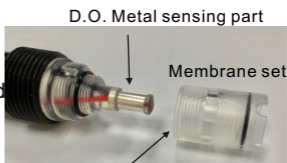
Rotate to remove the membrane set from the probe

(3)

Slowly drop the electrolyte into the new membrane set until it is 3/4 full.

(4)

Screw the new membrane set onto the probe.



Electrolyte drop in from here

(5)  
After installing the membrane set, it is fine to found small air bubbles in the electrolyte. But, the work area in the middle should be free from bubbles.




**Should be  
NO air bubble**


(6)  
100% saturated calibration in air after membrane replacement.

Note: Under normal use, the membrane set included with the goods should be enough for the life time of probe. It is not necessary to replace membrane set too frequently.




## SETUP

This meter has an advanced setting mode that allows you customize the parameters. If want to change the parameters, press "  " key >2 seconds to enter the setting mode.◦



The first setting you see is the salinity value. If you want to select other parameters, you can press "  " to select.

HOLD

When you see the parameter you want to set, use "  " and "  " to adjust the value up and down. After adjustment, press "  " to confirm.

mg/L ↔ %

HOLD

Setting	Icon	Default	Range	Reference
Salinity	SAL	0.0 ppt	0.0~45.0 ppt	AZ 8372 or AZ 8373
Pressure unit	AP	mmHg	mmHg or Kpa	
Pressure	AP	760 mmHg 101.3 Kpa	500~760mmHg 101.3~66.7Kpa	AZ 8750
Temp.unit	Unt	°C	°C or °F	
Backlight	bL	2	1, 2, 3 level	

## TROUBLE SHOOTING

### ◆ Already press power key but no display

- 1) Make sure you have pressed power key more than 0.1 second
- 2) Charging the battery first and then try again.

### ◆ Can't turn off the meter

- 1) Short press power key could not turn of the meter. Please press power key **longer time** to turn off the meter.

### ◆ Too big difference from previous measurement

Fill the electrolyte and replace the membrane according to the maintenance method of the probe. After replacement, please do 100% air saturated dissolved oxygen calibration.

### ◆ Error code list

#### **D.O. value**

E01: Indicates that the sensing element is damaged. Sensing element is a consumable and cannot be repaired

E03: The signal strength is too high, it is normal to appear for few seconds when the power is turned on, but if E03 continues, put probe in the air to re-calibrate. If no improvement, fill the electrolyte and replace membrane. If still invalid, sensing element is damaged.

E21: The measured temprature is lower than 10°C or above 40 °C, compensation feature works not fully in this range. D.O pen is still working but the accuracy is not the best.

#### **Temp. value**

E01: Indicates that the sensing element is damaged, the sensing element is a consumable and cannot be repaired

E02: The temperature measured is lower than 0°C , put it in the environment of 25 °C for 5 minutes, if there is no improvement, the sensing element is damaged, the sensing element is consumable and cannot be repaired

E03: The temperature measured is higher than 50°C, put it in the environment of 25 °C for 5 minutes, if it does not improve, the sensing element is damaged, the sensing element is consumable and cannot be repaired.

## SPECIFICATION

DO range (in mg/L)	0.00~20.00 mg/L
DO accuracy	+/-0.4 mg/L
DO resolution	0.01 mg/L
DO range (in %)	0.0~199.9
DO accuracy	+/-3% F.S
DO resolution	0.1 %
Temp. range	0~50.0°C/32~122°F
Temp. accuracy	+/-0.5°C/0.9°F
Temp. resolution	0.1°C
Auto Temp. Compensation	10~40.0°C/50~104°F
Manual Compensation	INCLUDED
Salinity range	0.0~45.0 ppt
Salinity res.	0.1 ppt
Barometric pressure	500~760mmHg/101.3~66.7Kpa
Pressure res.	1mmHg/0.1KPa
LCD size	30(H)x18(W)mm
Operating temp.	0~40°C
Operating RH%	Humidity<85%
Storage temp.	0~40°C
Storage RH%	Humidity < 80%
Sensor response time	<30 sec. for D.O., <90 sec. For temp.
Sensor warmup time	<60 seconds after power up
Sensor life time	>6 months (with good maintenance)
Dimension	176(L)x39(W)x39(H)
Weight	265g
Battery	3.7V@500mAh re-chargable battery
Power consumption	60 hours operation (no backlight condition)
Re-charging time	1.5 hours, Min. 500 cycles, 5VDC@1A
Standard Package	Meter (bat. Built-in)/D.O. Probe/Electrolyte /2pcs membrane kits/USB-type C cable/ storage plastic case/manual

## **WARRANTY**

The meter is warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers normal operation but does not cover battery, misuse, abuse, alteration, tampering, neglect, improper maintenance, or damage resulting from leaking batteries. Proof of purchase is required for warranty repairs. Warranty is void if the meter used to be taken apart .

## **RETURN AUTHORIZATION**

Authorization must be obtained from the supplier before returning items for any reason. When requiring a RA (Return Authorization), please include data regarding the defective reason, the meters are to be returned along with good packing to prevent any damage in shipment and insured against possible damage or loss.

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K.J.T.R.S.E. type Thermometer  
pH Meter  
Conductivity Meter  
T.D.S. Meter  
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